Don Lancaster's

MACHINE LANGUAGE PROGRAMMING COOKBOOK

Part One

Machine Language Programming Cookbook

Vivian Siahaan,Rismon Hasiholan Sianipar

Machine Language Programming Cookbook:

Don Lancaster's Micro Cookbook Don Lancaster, SIX BOOKS IN ONE: Classification, Prediction, and Sentiment Analysis Using Machine Learning and Deep Learning with Python GUI Vivian Siahaan,Rismon Hasiholan Sianipar,2022-04-11 Book 1 BANK LOAN STATUS CLASSIFICATION AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI The dataset used in this project consists of more than 100 000 customers mentioning their loan status current loan amount monthly debt etc There are 19 features in the dataset The dataset attributes are as follows Loan ID Customer ID Loan Status Current Loan Amount Term Credit Score Annual Income Years in current job Home Ownership Purpose Monthly Debt Years of Credit History Months since last delinquent Number of Open Accounts Number of Credit Problems Current Credit Balance Maximum Open Credit Bankruptcies and Tax Liens The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting and XGB classifier Three feature scaling used in machine learning are raw minmax scaler and standard scaler Finally you will develop a GUI using PyQt5 to plot cross validation score predicted values versus true values confusion matrix learning curve decision boundaries performance of the model scalability of the model training loss and training accuracy Book 2 OPINION MINING AND PREDICTION USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON GUI Opinion mining sometimes known as sentiment analysis or emotion AI refers to the use of natural language processing text analysis computational linguistics and biometrics to systematically identify extract quantify and study affective states and subjective information This dataset was created for the Paper From Group to Individual Labels using Deep Features Kotzias et al KDD 2015 It contains sentences labelled with a positive or negative sentiment Score is either 1 for positive or 0 for negative The sentences come from three different websites fields imdb com amazon com and yelp com For each website there exist 500 positive and 500 negative sentences Those were selected randomly for larger datasets of reviews Amazon contains reviews and scores for products sold on amazon com in the cell phones and accessories category and is part of the dataset collected by McAuley and Leskovec Scores are on an integer scale from 1 to 5 Reviews considered with a score of 4 and 5 to be positive and scores of 1 and 2 to be negative The data is randomly partitioned into two halves of 50% one for training and one for testing with 35 000 documents in each set IMDb refers to the IMDb movie review sentiment dataset originally introduced by Maas et al as a benchmark for sentiment analysis This dataset contains a total of 100 000 movie reviews posted on imdb com There are 50 000 unlabeled reviews and the remaining 50 000 are divided into a set of 25 000 reviews for training and 25 000 reviews for testing Each of the labeled reviews has a binary sentiment label either positive or negative Yelp refers to the dataset from the Yelp dataset challenge from which we extracted the restaurant reviews Scores are on an integer scale from 1 to 5 Reviews considered with scores 4 and 5 to be positive and 1 and 2 to be negative The data is randomly generated a 50 50 training and testing split which led to approximately 300 000 documents for each set Sentences for each of the

datasets above labels are extracted and manually 1000 sentences are manually labeled from the test set with 50% positive sentiment and 50% negative sentiment These sentences are only used to evaluate our instance level classifier for each dataset3 They are not used for model training to maintain consistency with our overall goal of learning at a group level and predicting at the instance level The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting and XGB classifier Three feature scaling used in machine learning are raw minmax scaler and standard scaler Finally you will develop a GUI using PyQt5 to plot cross validation score predicted values versus true values confusion matrix learning curve decision boundaries performance of the model scalability of the model training loss and training accuracy Book 3 EMOTION PREDICTION FROM TEXT USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON GUI In the dataset used in this project there are two columns Text and Emotion Quite self explanatory The Emotion column has various categories ranging from happiness to sadness to love and fear You will build and implement machine learning and deep learning models which can identify what words denote what emotion The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting and XGB classifier Three feature scaling used in machine learning are raw minmax scaler and standard scaler Finally you will develop a GUI using PyQt5 to plot cross validation score predicted values versus true values confusion matrix learning curve decision boundaries performance of the model scalability of the model training loss and training accuracy Book 4 HATE SPEECH DETECTION AND SENTIMENT ANALYSIS USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON GUI The objective of this task is to detect hate speech in tweets For the sake of simplicity a tweet contains hate speech if it has a racist or sexist sentiment associated with it So the task is to classify racist or sexist tweets from other tweets Formally given a training sample of tweets and labels where label 1 denotes the tweet is racist sexist and label 0 denotes the tweet is not racist sexist the objective is to predict the labels on the test dataset The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier LSTM and CNN Three feature scaling used in machine learning are raw minmax scaler and standard scaler Finally you will develop a GUI using PyQt5 to plot cross validation score predicted values versus true values confusion matrix learning curve decision boundaries performance of the model scalability of the model training loss and training accuracy Book 5 TRAVEL REVIEW RATING CLASSIFICATION AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI The dataset used in this project has been sourced from the Machine Learning Repository of University of California Irvine UC Irvine Travel Review Ratings Data Set This dataset is populated by capturing user ratings from Google reviews Reviews on attractions from 24 categories across Europe are considered Google user rating ranges from 1 to 5 and average user rating per category is calculated The attributes in the dataset are as follows Attribute 1 Unique user id Attribute 2 Average ratings

on churches Attribute 3 Average ratings on resorts Attribute 4 Average ratings on beaches Attribute 5 Average ratings on parks Attribute 6 Average ratings on theatres Attribute 7 Average ratings on museums Attribute 8 Average ratings on malls Attribute 9 Average ratings on zoo Attribute 10 Average ratings on restaurants Attribute 11 Average ratings on pubs bars Attribute 12 Average ratings on local services Attribute 13 Average ratings on burger pizza shops Attribute 14 Average ratings on hotels other lodgings Attribute 15 Average ratings on juice bars Attribute 16 Average ratings on art galleries Attribute 17 Average ratings on dance clubs Attribute 18 Average ratings on swimming pools Attribute 19 Average ratings on gyms Attribute 20 Average ratings on bakeries Attribute 21 Average ratings on beauty Attribute 22 Average ratings on cafes Attribute 23 Average ratings on view points Attribute 24 Average ratings on monuments and Attribute 25 Average ratings on gardens The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier and MLP classifier Three feature scaling used in machine learning are raw minmax scaler and standard scaler Finally you will develop a GUI using PyQt5 to plot cross validation score predicted values versus true values confusion matrix learning curve decision boundaries performance of the model scalability of the model training loss and training accuracy Book 6 ONLINE RETAIL CLUSTERING AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI The dataset used in this project is a transnational dataset which contains all the transactions occurring between 01 12 2010 and 09 12 2011 for a UK based and registered non store online retail The company mainly sells unique all occasion gifts Many customers of the company are wholesalers You will be using the online retail transnational dataset to build a RFM clustering and choose the best set of customers which the company should target In this project you will perform Cohort analysis and RFM analysis You will also perform clustering using K Means to get 5 clusters The machine learning models used in this project to predict clusters as target variable are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM Gradient Boosting XGB and MLP Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy **THREE DATA SCIENCE PROJECTS FOR RFM ANALYSIS, K-MEANS CLUSTERING, AND MACHINE LEARNING BASED PREDICTION WITH PYTHON GUI** Vivian Siahaan,Rismon Hasiholan Sianipar,2022-05-11 PROJECT 1 RFM ANALYSIS AND K MEANS CLUSTERING A CASE STUDY ANALYSIS CLUSTERING AND PREDICTION ON RETAIL STORE TRANSACTIONS WITH PYTHON GUI The dataset used in this project is the detailed data on sales of consumer goods obtained by scanning the bar codes for individual products at electronic points of sale in a retail store The dataset provides detailed information about quantities characteristics and values of goods sold as well as their prices The anonymized dataset includes 64 682 transactions of 5 242 SKU s sold to 22 625 customers during one year Dataset Attributes are as follows Date of Sales Transaction Customer ID Transaction ID SKU Category ID

SKU ID Quantity Sold and Sales Amount Unit price times quantity For unit price please divide Sales Amount by Quantity This dataset can be analyzed with RFM analysis and can be clustered using K Means algorithm The machine learning models used in this project to predict clusters as target variable are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM Gradient Boosting XGB and MLP Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 2 DATA SCIENCE FOR GROCERIES MARKET ANALYSIS CLUSTERING AND PREDICTION WITH PYTHON GUI RFM analysis used in this project can be used as a marketing technique used to quantitatively rank and group customers based on the recency frequency and monetary total of their recent transactions to identify the best customers and perform targeted marketing campaigns The idea is to segment customers based on when their last purchase was how often they ve purchased in the past and how much they ve spent overall Clustering in this case K Means algorithm used in this project can be used to place similar customers into mutually exclusive groups these groups are known as segments while the act of grouping is known as segmentation Segmentation allows businesses to identify the different types and preferences of customers markets they serve This is crucial information to have to develop highly effective marketing product and business strategies The dataset in this project has 38765 rows of the purchase orders of people from the grocery stores These orders can be analyzed with RFM analysis and can be clustered using K Means algorithm The machine learning models used in this project to predict clusters as target variable are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM Gradient Boosting XGB and MLP Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 3 ONLINE RETAIL CLUSTERING AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI The dataset used in this project is a transnational dataset which contains all the transactions occurring between 01 12 2010 and 09 12 2011 for a UK based and registered non store online retail The company mainly sells unique all occasion gifts Many customers of the company are wholesalers You will be using the online retail transnational dataset to build a RFM clustering and choose the best set of customers which the company should target In this project you will perform Cohort analysis and RFM analysis You will also perform clustering using K Means to get 5 clusters The machine learning models used in this project to predict clusters as target variable are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM Gradient Boosting XGB and MLP Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy DATA SCIENCE CRASH COURSE: Voice Based Gender Classification and

Prediction Using Machine Learning and Deep Learning with Python GUI Vivian Siahaan,Rismon Hasiholan Sianipar,2021-12-08 This dataset was created to identify a voice as male or female based upon acoustic properties of the voice and speech The dataset consists of 3 168 recorded voice samples collected from male and female speakers The voice samples are pre processed by acoustic analysis in R using the seewave and tuneR packages with an analyzed frequency range of 0hz 280hz human vocal range The following acoustic properties of each voice are measured and included within the CSV meanfreq mean frequency in kHz sd standard deviation of frequency median median frequency in kHz Q25 first quantile in kHz Q75 third quantile in kHz IQR interquantile range in kHz skew skewness kurt kurtosis sp ent spectral entropy sfm spectral flatness mode mode frequency centroid frequency centroid see specprop peakf peak frequency frequency with highest energy meanfun average of fundamental frequency measured across acoustic signal minfun minimum fundamental frequency measured across acoustic signal maxfun maximum fundamental frequency measured across acoustic signal meandom average of dominant frequency measured across acoustic signal mindom minimum of dominant frequency measured across acoustic signal maxdom maximum of dominant frequency measured across acoustic signal dfrange range of dominant frequency measured across acoustic signal modindx modulation index Calculated as the accumulated absolute difference between adjacent measurements of fundamental frequencies divided by the frequency range and label male or female The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy *Kilobaud: Microcomputing* ,1982 PYTHON GUI PROJECTS WITH MACHINE LEARNING AND DEEP LEARNING Vivian Siahaan,Rismon Hasiholan Sianipar,2022-01-16 PROJECT 1 THE APPLIED DATA SCIENCE WORKSHOP Prostate Cancer Classification and Recognition Using Machine Learning and Deep Learning with Python GUI Prostate cancer is cancer that occurs in the prostate The prostate is a small walnut shaped gland in males that produces the seminal fluid that nourishes and transports sperm Prostate cancer is one of the most common types of cancer Many prostate cancers grow slowly and are confined to the prostate gland where they may not cause serious harm However while some types of prostate cancer grow slowly and may need minimal or even no treatment other types are aggressive and can spread quickly The dataset used in this project consists of 100 patients which can be used to implement the machine learning and deep learning algorithms The dataset consists of 100 observations and 10 variables out of which 8 numeric variables and one categorical variable and is ID which are as follows Id Radius Texture Perimeter Area Smoothness Compactness Diagnosis Result Symmetry and Fractal Dimension The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient

Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 2 THE APPLIED DATA SCIENCE WORKSHOP Urinary Biomarkers Based Pancreatic Cancer Classification and Prediction Using Machine Learning with Python GUI Pancreatic cancer is an extremely deadly type of cancer Once diagnosed the five year survival rate is less than 10% However if pancreatic cancer is caught early the odds of surviving are much better Unfortunately many cases of pancreatic cancer show no symptoms until the cancer has spread throughout the body A diagnostic test to identify people with pancreatic cancer could be enormously helpful In a paper by Silvana Debernardi and colleagues published this year in the journal PLOS Medicine a multi national team of researchers sought to develop an accurate diagnostic test for the most common type of pancreatic cancer called pancreatic ductal adenocarcinoma or PDAC They gathered a series of biomarkers from the urine of three groups of patients Healthy controls Patients with non cancerous pancreatic conditions like chronic pancreatitis and Patients with pancreatic ductal adenocarcinoma When possible these patients were age and sex matched The goal was to develop an accurate way to identify patients with pancreatic cancer The key features are four urinary biomarkers creatinine LYVE1 REG1B and TFF1 Creatinine is a protein that is often used as an indicator of kidney function YVLE1 is lymphatic vessel endothelial hyaluronan receptor 1 a protein that may play a role in tumor metastasis REG1B is a protein that may be associated with pancreas regeneration TFF1 is trefoil factor 1 which may be related to regeneration and repair of the urinary tract The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier and MLP classifier Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 3 DATA SCIENCE CRASH COURSE Voice Based Gender Classification and Prediction Using Machine Learning and Deep Learning with Python GUI This dataset was created to identify a voice as male or female based upon acoustic properties of the voice and speech The dataset consists of 3 168 recorded voice samples collected from male and female speakers The voice samples are pre processed by acoustic analysis in R using the seewave and tuneR packages with an analyzed frequency range of 0hz 280hz human vocal range The following acoustic properties of each voice are measured and included within the CSV meanfreq mean frequency in kHz sd standard deviation of frequency median median frequency in kHz Q25 first quantile in kHz Q75 third quantile in kHz IQR interquantile range in kHz skew skewness kurt kurtosis sp ent spectral entropy sfm spectral flatness mode mode frequency centroid frequency centroid see specprop peakf peak frequency frequency with highest energy meanfun average of fundamental frequency measured across acoustic signal minfun minimum fundamental frequency

measured across acoustic signal maxfun maximum fundamental frequency measured across acoustic signal meandom average of dominant frequency measured across acoustic signal mindom minimum of dominant frequency measured across acoustic signal maxdom maximum of dominant frequency measured across acoustic signal dfrange range of dominant frequency measured across acoustic signal modindx modulation index Calculated as the accumulated absolute difference between adjacent measurements of fundamental frequencies divided by the frequency range and label male or female The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 4 DATA SCIENCE CRASH COURSE Thyroid Disease Classification and Prediction Using Machine Learning and Deep Learning with Python GUI Thyroid disease is a general term for a medical condition that keeps your thyroid from making the right amount of hormones Thyroid typically makes hormones that keep body functioning normally When the thyroid makes too much thyroid hormone body uses energy too quickly The two main types of thyroid disease are hypothyroidism and hyperthyroidism Both conditions can be caused by other diseases that impact the way the thyroid gland works Dataset used in this project was from Garavan Institute Documentation as given by Ross Quinlan 6 databases from the Garavan Institute in Sydney Australia Approximately the following for each database 2800 training data instances and 972 test instances This dataset contains plenty of missing data while 29 or so attributes either Boolean or continuously valued The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy **The Applied Data Science Workshop On Medical Datasets Using Machine Learning and Deep Learning with Python GUI** Vivian Siahaan,Rismon Hasiholan Sianipar,2022-01-07 Workshop 1 Heart Failure Analysis and Prediction Using Scikit Learn Keras and TensorFlow with Python GUI Cardiovascular diseases CVDs are the number 1 cause of death globally taking an estimated 17 9 million lives each year which accounts for 31% of all deaths worldwide Heart failure is a common event caused by CVDs and this dataset contains 12 features that can be used to predict mortality by heart failure People with cardiovascular disease or who are at high cardiovascular risk due to the presence of one or more risk factors such as hypertension diabetes hyperlipidaemia or already established disease need early detection and management wherein a machine learning models can be of great help Dataset used in this project is from Davide Chicco Giuseppe Jurman Machine learning can predict survival of patients with heart

failure from serum creatinine and ejection fraction alone BMC Medical Informatics and Decision Making 20 16 2020 Attribute information in the dataset are as follows age Age anaemia Decrease of red blood cells or hemoglobin boolean creatinine_phosphokinase Level of the CPK enzyme in the blood mcg L diabetes If the patient has diabetes boolean ejection_fraction Percentage of blood leaving the heart at each contraction percentage high_blood_pressure If the patient has hypertension boolean platelets Platelets in the blood kiloplatelets mL serum_creatinine Level of serum creatinine in the blood mg dL serum_sodium Level of serum sodium in the blood mEq L sex Woman or man binary smoking If the patient smokes or not boolean time Follow up period days and DEATH_EVENT If the patient deceased during the follow up period boolean The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performace of the model scalability of the model training loss and training accuracy WORKSHOP 2 Cervical Cancer Classification and Prediction Using Machine Learning and Deep Learning with Python GUI About 11 000 new cases of invasive cervical cancer are diagnosed each year in the U S However the number of new cervical cancer cases has been declining steadily over the past decades Although it is the most preventable type of cancer each year cervical cancer kills about 4 000 women in the U S and about 300 000 women worldwide Numerous studies report that high poverty levels are linked with low screening rates In addition lack of health insurance limited transportation and language difficulties hinder a poor woman s access to screening services Human papilloma virus HPV is the main risk factor for cervical cancer In adults the most important risk factor for HPV is sexual activity with an infected person Women most at risk for cervical cancer are those with a history of multiple sexual partners sexual intercourse at age 17 years or younger or both A woman who has never been sexually active has a very low risk for developing cervical cancer Sexual activity with multiple partners increases the likelihood of many other sexually transmitted infections chlamydia gonorrhea syphilis Studies have found an association between chlamydia and cervical cancer risk including the possibility that chlamydia may prolong HPV infection Therefore early detection of cervical cancer using machine and deep learning models can be of great help The dataset used in this project is obtained from UCI Repository and kindly acknowledged This file contains a List of Risk Factors for Cervical Cancer leading to a Biopsy Examination The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performace of the model scalability of the model training loss and training accuracy WORKSHOP 3 Chronic Kidney Disease Classification and Prediction Using Machine Learning and

Deep Learning with Python GUI Chronic kidney disease is the longstanding disease of the kidneys leading to renal failure The kidneys filter waste and excess fluid from the blood As kidneys fail waste builds up Symptoms develop slowly and aren t specific to the disease Some people have no symptoms at all and are diagnosed by a lab test Medication helps manage symptoms In later stages filtering the blood with a machine dialysis or a transplant may be required The dataset used in this project was taken over a 2 month period in India with 25 features eg red blood cell count white blood cell count etc The target is the classification which is either ckd or notckd ckd chronic kidney disease It contains measures of 24 features for 400 people Quite a lot of features for just 400 samples There are 14 categorical features while 10 are numerical The dataset needs cleaning in that it has NaNs and the numeric features need to be forced to floats Attribute Information Age numerical age in years Blood Pressure numerical bp in mm Hg Specific Gravity categorical sg 1 005 1 010 1 015 1 020 1 025 Albumin categorical al 0 1 2 3 4 5 Sugar categorical su 0 1 2 3 4 5 Red Blood Cells categorical rbc normal abnormal Pus Cell categorical pc normal abnormal Pus Cell clumps categorical pcc present notpresent Bacteria categorical ba present notpresent Blood Glucose Random numerical bgr in mgs dl Blood Urea numerical bu in mgs dl Serum Creatinine numerical sc in mgs dl Sodium numerical sod in mEq L Potassium numerical pot in mEq L Hemoglobin numerical hemo in gms Packed Cell Volume numerical White Blood Cell Count numerical wc in cells cumm Red Blood Cell Count numerical rc in millions cmm Hypertension categorical htn yes no Diabetes Mellitus categorical dm yes no Coronary Artery Disease categorical cad yes no Appetite categorical appet good poor Pedal Edema categorical pe yes no Anemia categorical ane yes no and Class categorical class ckd notckd The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performace of the model scalability of the model training loss and training accuracy WORKSHOP 4 Lung Cancer Classification and Prediction Using Machine Learning and Deep Learning with Python GUI The effectiveness of cancer prediction system helps the people to know their cancer risk with low cost and it also helps the people to take the appropriate decision based on their cancer risk status The data is collected from the website online lung cancer prediction system Total number of attributes in the dataset is 16 while number of instances is 309 Following are attribute information of dataset Gender M male F female Age Age of the patient Smoking YES 2 NO 1 Yellow fingers YES 2 NO 1 Anxiety YES 2 NO 1 Peer_pressure YES 2 NO 1 Chronic Disease YES 2 NO 1 Fatigue YES 2 NO 1 Allergy YES 2 NO 1 Wheezing YES 2 NO 1 Alcohol YES 2 NO 1 Coughing YES 2 NO 1 Shortness of Breath YES 2 NO 1 Swallowing Difficulty YES 2 NO 1 Chest pain YES 2 NO 1 and Lung Cancer YES NO The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will

develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performace of the model scalability of the model training loss and training accuracy WORKSHOP 5 Alzheimer s Disease Classification and Prediction Using Machine Learning and Deep Learning with Python GUI Alzheimer s is a type of dementia that causes problems with memory thinking and behavior Symptoms usually develop slowly and get worse over time becoming severe enough to interfere with daily tasks Alzheimer s is not a normal part of aging The greatest known risk factor is increasing age and the majority of people with Alzheimer s are 65 and older But Alzheimer s is not just a disease of old age Approximately 200 000 Americans under the age of 65 have younger onset Alzheimer s disease also known as early onset Alzheimer s The dataset consists of a longitudinal MRI data of 374 subjects aged 60 to 96 Each subject was scanned at least once Everyone is right handed 206 of the subjects were grouped as Nondemented throughout the study 107 of the subjects were grouped as Demented at the time of their initial visits and remained so throughout the study 14 subjects were grouped as Nondemented at the time of their initial visit and were subsequently characterized as Demented at a later visit These fall under the Converted category Following are some important features in the dataset EDUC Years of Education SES Socioeconomic Status MMSE Mini Mental State Examination CDR Clinical Dementia Rating eTIV Estimated Total Intracranial Volume nWBV Normalize Whole Brain Volume and ASF Atlas Scaling Factor The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy WORKSHOP 6 Parkinson Classification and Prediction Using Machine Learning and Deep Learning with Python GUI The dataset was created by Max Little of the University of Oxford in collaboration with the National Centre for Voice and Speech Denver Colorado who recorded the speech signals The original study published the feature extraction methods for general voice disorders This dataset is composed of a range of biomedical voice measurements from 31 people 23 with Parkinson s disease PD Each column in the table is a particular voice measure and each row corresponds one of 195 voice recording from these individuals name column The main aim of the data is to discriminate healthy people from those with PD according to status column which is set to 0 for healthy and 1 for PD The data is in ASCII CSV format The rows of the CSV file contain an instance corresponding to one voice recording There are around six recordings per patient the name of the patient is identified in the first column Attribute information of this dataset are as follows name ASCII subject name and recording number MDVP Fo Hz Average vocal fundamental frequency MDVP Fhi Hz Maximum vocal fundamental frequency MDVP Flo Hz Minimum vocal fundamental frequency MDVP Jitter % MDVP Jitter Abs MDVP RAP MDVP PPQ Jitter DDP Several measures of variation in fundamental frequency MDVP Shimmer MDVP

Shimmer dB Shimmer APQ3 Shimmer APQ5 MDVP APQ Shimmer DDA Several measures of variation in amplitude NHR HNR Two measures of ratio of noise to tonal components in the voice status Health status of the subject one Parkinson s zero healthy RPDE D2 Two nonlinear dynamical complexity measures DFA Signal fractal scaling exponent and spread1 spread2 PPE Three nonlinear measures of fundamental frequency variation The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy WORKSHOP 7 Liver Disease Classification and Prediction Using Machine Learning and Deep Learning with Python GUI Patients with Liver disease have been continuously increasing because of excessive consumption of alcohol inhale of harmful gases intake of contaminated food pickles and drugs This dataset was used to evaluate prediction algorithms in an effort to reduce burden on doctors This dataset contains 416 liver patient records and 167 non liver patient records collected from North East of Andhra Pradesh India The Dataset column is a class label used to divide groups into liver patient liver disease or not no disease This data set contains 441 male patient records and 142 female patient records Any patient whose age exceeded 89 is listed as being of age 90 Columns in the dataset Age of the patient Gender of the patient Total Bilirubin Direct Bilirubin Alkaline Phosphotase Alamine Aminotransferase Aspartate Aminotransferase Total Protiens Albumin Albumin and Globulin Ratio and Dataset field used to split the data into two sets patient with liver disease or no disease The models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will develop a GUI using PyQt5 to plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy **Clean Code Cookbook** Maximiliano Contieri,2023-09-11 Often software engineers and architects work with large complex code bases that they need to scale and maintain With this cookbook author Maximiliano Contieri takes you beyond the concept of clean code by showing you how to identify improvement opportunities and their impact on production code When it comes to reliability and system evolution these techniques provide benefits that pay off over time Using real life examples in JavaScript PHP Java Python and many other programming languages this cookbook provides proven recipes to help you scale and maintain large systems Every section covers fundamental concepts including readability coupling testability and extensibility as well as code smells symptoms of a problem that requires special attention and the recipes to address them As you proceed through this book refactoring recipes and the variety of code smells increase in complexity You will Understand the benefits of clean code and learn how to detect code smells Learn refactoring techniques

step by step Gain illustrative code examples in several modern programming languages Get a comprehensive catalog of common code smells their impacts and possible solutions Use code that s straight to the point favoring readability and learning **C++ System Programming Cookbook** Onorato Vaticone,2020-02-21 A problem solution based guide to help you overcome hurdles effectively while working with kernel APIs filesystems networks threads and process communications Key Features Learn to apply the latest C features from C 11 14 17 and 20 to facilitate systems programming Create robust and concurrent systems that make the most of the available hardware resources Delve into C inbuilt libraries and frameworks to design robust systems as per your business needs Book DescriptionC is the preferred language for system programming due to its efficient low level computation data abstraction and object oriented features System programming is about designing and writing computer programs that interact closely with the underlying operating system and allow computer hardware to interface with the programmer and the user The C System Programming Cookbook will serve as a reference for developers who want to have ready to use solutions for the essential aspects of system programming using the latest C standards wherever possible This C book starts out by giving you an overview of system programming and refreshing your C knowledge Moving ahead you will learn how to deal with threads and processes before going on to discover recipes for how to manage memory The concluding chapters will then help you understand how processes communicate and how to interact with the console console I O Finally you will learn how to deal with time interfaces signals and CPU scheduling By the end of the book you will become adept at developing robust systems applications using C What you will learn Get up to speed with the fundamentals including makefile man pages compilation and linking and debugging Understand how to deal with time interfaces signals and CPU scheduling Develop your knowledge of memory management Use processes and threads for advanced synchronizations mutexes and condition variables Understand interprocess communications IPC pipes FIFOs message queues shared memory and TCP and UDP Discover how to interact with the console console I O Who this book is for This book is for C developers who want to gain practical knowledge of systems programming Though no experience of Linux system programming is assumed intermediate knowledge of C is necessary **Julia 1.0 Programming Cookbook** Bogumił Kamiński,Przemysław Szufel,2018-11-29 Discover the new features and widely used packages in Julia to solve complex computational problems in your statistical applications Key FeaturesAddress the core problems of programming in Julia with the most popular packages for common tasksTackle issues while working with Databases and Parallel data processing with JuliaExplore advanced features such as metaprogramming functional programming and user defined typesBook Description Julia with its dynamic nature and high performance provides comparatively minimal time for the development of computational models with easy to maintain computational code This book will be your solution based guide as it will take you through different programming aspects with Julia Starting with the new features of Julia 1 0 each recipe addresses a specific problem providing a solution and explaining how it works You will work with the powerful Julia tools and data

structures along with the most popular Julia packages You will learn to create vectors handle variables and work with functions You will be introduced to various recipes for numerical computing distributed computing and achieving high performance You will see how to optimize data science programs with parallel computing and memory allocation We will look into more advanced concepts such as metaprogramming and functional programming Finally you will learn how to tackle issues while working with databases and data processing and will learn about on data science problems data modeling data analysis data manipulation parallel processing and cloud computing with Julia By the end of the book you will have acquired the skills to work more effectively with your data What you will learnBoost your code s performance using Julia s unique featuresOrganize data in to fundamental types of collections arrays and dictionariesOrganize data science processes within Julia and solve related problemsScale Julia computations with cloud computingWrite data to IO streams with Julia and handle web transferDefine your own immutable and mutable typesSpeed up the development process using metaprogrammingWho this book is for This book is for developers who would like to enhance their Julia programming skills and would like to get some quick solutions to their common programming problems Basic Julia programming knowledge is assumed

Classification and Prediction Projects with Machine Learning and Deep Learning Vivian Siahaan,Rismon Hasiholan Sianipar,2022-02-06 PROJECT 1 DATA SCIENCE CRASH COURSE Drinking Water Potability Classification and Prediction Using Machine Learning and Deep Learning with Python Access to safe drinking water is essential to health a basic human right and a component of effective policy for health protection This is important as a health and development issue at a national regional and local level In some regions it has been shown that investments in water supply and sanitation can yield a net economic benefit since the reductions in adverse health effects and health care costs outweigh the costs of undertaking the interventions The drinkingwaterpotability csv file contains water quality metrics for 3276 different water bodies The columns in the file are as follows ph Hardness Solids Chloramines Sulfate Conductivity Organic_carbon Trihalomethanes Turbidity and Potability Contaminated water and poor sanitation are linked to the transmission of diseases such as cholera diarrhea dysentery hepatitis A typhoid and polio Absent inadequate or inappropriately managed water and sanitation services expose individuals to preventable health risks This is particularly the case in health care facilities where both patients and staff are placed at additional risk of infection and disease when water sanitation and hygiene services are lacking The machine learning models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 2 DATA SCIENCE CRASH COURSE Skin Cancer Classification and Prediction Using Machine Learning and Deep Learning Skin cancer develops primarily on areas of sun exposed skin including the scalp

face lips ears neck chest arms and hands and on the legs in women But it can also form on areas that rarely see the light of day your palms beneath your fingernails or toenails and your genital area Skin cancer affects people of all skin tones including those with darker complexions When melanoma occurs in people with dark skin tones it s more likely to occur in areas not normally exposed to the sun such as the palms of the hands and soles of the feet Dataset used in this project contains a balanced dataset of images of benign skin moles and malignant skin moles The data consists of two folders with each 1800 pictures 224x244 of the two types of moles The machine learning models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D The deep learning models used are CNN and MobileNet

Practical System Programming for Rust Developers Prabhu Eshwarla,2020-12-24 Explore various Rust features data structures libraries and toolchain to build modern systems software with the help of hands on examples Key FeaturesLearn techniques to design and build system tools and utilities in RustExplore the different features of the Rust standard library for interacting with operating systemsGain an in depth understanding of the Rust programming language by writing low level softwareBook Description Modern programming languages such as Python JavaScript and Java have become increasingly accepted for application level programming but for systems programming C and C are predominantly used due to the need for low level control of system resources Rust promises the best of both worlds the type safety of Java and the speed and expressiveness of C while also including memory safety without a garbage collector This book is a comprehensive introduction if you re new to Rust and systems programming and are looking to build reliable and efficient systems software without C or C The book takes a unique approach by starting each topic with Linux kernel concepts and APIs relevant to that topic You ll also explore how system resources can be controlled from Rust As you progress you ll delve into advanced topics You ll cover network programming focusing on aspects such as working with low level network primitives and protocols in Rust before going on to learn how to use and compile Rust with WebAssembly Later chapters will take you through practical code examples and projects to help you build on your knowledge By the end of this Rust programming book you will be equipped with practical skills to write systems software tools libraries and utilities in Rust What you will learnGain a solid understanding of how system resources are managedUse Rust confidently to control and operate a Linux or Unix systemUnderstand how to write a host of practical systems software tools and utilitiesDelve into memory management with the memory layout of Rust programsDiscover the capabilities and features of the Rust Standard LibraryExplore external crates to improve productivity for future Rust programming projectsWho this book is for This book is for developers with basic knowledge of Rust but little to no knowledge or experience of systems programming System programmers who want to consider Rust as an alternative to C or C will also find this book useful **ANALYSIS AND PREDICTION PROJECTS USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON** Vivian Siahaan,Rismon Hasiholan

Sianipar,2022-02-17 PROJECT 1 DEFAULT LOAN PREDICTION BASED ON CUSTOMER BEHAVIOR Using Machine Learning and Deep Learning with Python In finance default is failure to meet the legal obligations or conditions of a loan for example when a home buyer fails to make a mortgage payment or when a corporation or government fails to pay a bond which has reached maturity A national or sovereign default is the failure or refusal of a government to repay its national debt The dataset used in this project belongs to a Hackathon organized by Univ AI All values were provided at the time of the loan application Following are the features in the dataset Income Age Experience Married Single House_Ownership Car_Ownership Profession CITY STATE CURRENT_JOB_YRS CURRENT_HOUSE_YRS and Risk_Flag The Risk_Flag indicates whether there has been a default in the past or not The machine learning models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine Adaboost LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 2 AIRLINE PASSENGER SATISFACTION Analysis and Prediction Using Machine Learning and Deep Learning with Python The dataset used in this project contains an airline passenger satisfaction survey In this case you will determine what factors are highly correlated to a satisfied or dissatisfied passenger and predict passenger satisfaction Below are the features in the dataset Gender Gender of the passengers Female Male Customer Type The customer type Loyal customer disloyal customer Age The actual age of the passengers Type of Travel Purpose of the flight of the passengers Personal Travel Business Travel Class Travel class in the plane of the passengers Business Eco Eco Plus Flight distance The flight distance of this journey Inflight wifi service Satisfaction level of the inflight wifi service 0 Not Applicable 1 5 Departure Arrival time convenient Satisfaction level of Departure Arrival time convenient Ease of Online booking Satisfaction level of online booking Gate location Satisfaction level of Gate location Food and drink Satisfaction level of Food and drink Online boarding Satisfaction level of online boarding Seat comfort Satisfaction level of Seat comfort Inflight entertainment Satisfaction level of inflight entertainment On board service Satisfaction level of On board service Leg room service Satisfaction level of Leg room service Baggage handling Satisfaction level of baggage handling Check in service Satisfaction level of Check in service Inflight service Satisfaction level of inflight service Cleanliness Satisfaction level of Cleanliness Departure Delay in Minutes Minutes delayed when departure Arrival Delay in Minutes Minutes delayed when Arrival and Satisfaction Airline satisfaction level Satisfaction neutral or dissatisfaction The machine learning models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability

of the model training loss and training accuracy PROJECT 3 CREDIT CARD CHURNING CUSTOMER ANALYSIS AND PREDICTION USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON The dataset used in this project consists of more than 10 000 customers mentioning their age salary marital_status credit card limit credit card category etc There are 20 features in the dataset In the dataset there are only 16 07% of customers who have churned Thus it s a bit difficult to train our model to predict churning customers Following are the features in the dataset Attrition_Flag Customer_Age Gender Dependent_count Education_Level Marital_Status Income_Category Card_Category Months_on_book Total_Relationship_Count Months_Inactive_12_mon Contacts_Count_12_mon Credit_Limit Total_Revolving_Bal Avg_Open_To_Buy Total_Amt_Chng_Q4_Q1 Total_Trans_Amt Total_Trans_Ct Total_Ct_Chng_Q4_Q1 and Avg_Utilization_Ratio The target variable is Attrition_Flag The machine learning models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 4 MARKETING ANALYSIS AND PREDICTION USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON This data set was provided to students for their final project in order to test their statistical analysis skills as part of a MSc in Business Analytics It can be utilized for EDA Statistical Analysis and Visualizations Following are the features in the dataset ID Customer s unique identifier Year_Birth Customer s birth year Education Customer s education level Marital_Status Customer s marital status Income Customer s yearly household income Kidhome Number of children in customer s household Teenhome Number of teenagers in customer s household Dt_Customer Date of customer s enrollment with the company Recency Number of days since customer s last purchase MntWines Amount spent on wine in the last 2 years MntFruits Amount spent on fruits in the last 2 years MntMeatProducts Amount spent on meat in the last 2 years MntFishProducts Amount spent on fish in the last 2 years MntSweetProducts Amount spent on sweets in the last 2 years MntGoldProds Amount spent on gold in the last 2 years NumDealsPurchases Number of purchases made with a discount NumWebPurchases Number of purchases made through the company s web site NumCatalogPurchases Number of purchases made using a catalogue NumStorePurchases Number of purchases made directly in stores NumWebVisitsMonth Number of visits to company s web site in the last month AcceptedCmp3 1 if customer accepted the offer in the 3rd campaign 0 otherwise AcceptedCmp4 1 if customer accepted the offer in the 4th campaign 0 otherwise AcceptedCmp5 1 if customer accepted the offer in the 5th campaign 0 otherwise AcceptedCmp1 1 if customer accepted the offer in the 1st campaign 0 otherwise AcceptedCmp2 1 if customer accepted the offer in the 2nd campaign 0 otherwise Response 1 if customer accepted the offer in the last campaign 0 otherwise Complain 1 if customer complained in the last 2 years 0 otherwise and Country Customer s location The machine and deep learning

models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM classifier Gradient Boosting XGB classifier MLP classifier and CNN 1D Finally you will plot boundary decision ROC distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 5 METEOROLOGICAL DATA ANALYSIS AND PREDICTION USING MACHINE LEARNING WITH PYTHON Meteorological phenomena are described and quantified by the variables of Earth s atmosphere temperature air pressure water vapour mass flow and the variations and interactions of these variables and how they change over time Different spatial scales are used to describe and predict weather on local regional and global levels The dataset used in this project consists of meteorological data with 96453 total number of data points and with 11 attributes columns Following are the columns in the dataset Formatted Date Summary Precip Type Temperature C Apparent Temperature C Humidity Wind Speed km h Wind Bearing degrees Visibility km Pressure millibars and Daily Summary The machine learning models used in this project are K Nearest Neighbor Random Forest Naive Bayes Logistic Regression Decision Tree Support Vector Machine LGBM classifier Gradient Boosting XGB classifier and MLP classifier Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy LEARN FROM SCRATCH MACHINE LEARNING WITH PYTHON GUI Vivian Siahaan,Rismon Hasiholan Sianipar,2021-03-03 In this book you will learn how to use NumPy Pandas OpenCV Scikit Learn and other libraries to how to plot graph and to process digital image Then you will learn how to classify features using Perceptron Adaline Logistic Regression LR Support Vector Machine SVM Decision Tree DT Random Forest RF and K Nearest Neighbor KNN models You will also learn how to extract features using Principal Component Analysis PCA Linear Discriminant Analysis LDA Kernel Principal Component Analysis KPCA algorithms and use them in machine learning In Chapter 1 you will learn Tutorial Steps To Create A Simple GUI Application Tutorial Steps to Use Radio Button Tutorial Steps to Group Radio Buttons Tutorial Steps to Use CheckBox Widget Tutorial Steps to Use Two CheckBox Groups Tutorial Steps to Understand Signals and Slots Tutorial Steps to Convert Data Types Tutorial Steps to Use Spin Box Widget Tutorial Steps to Use ScrollBar and Slider Tutorial Steps to Use List Widget Tutorial Steps to Select Multiple List Items in One List Widget and Display It in Another List Widget Tutorial Steps to Insert Item into List Widget Tutorial Steps to Use Operations on Widget List Tutorial Steps to Use Combo Box Tutorial Steps to Use Calendar Widget and Date Edit and Tutorial Steps to Use Table Widget In Chapter 2 you will learn Tutorial Steps To Create A Simple Line Graph Tutorial Steps To Create A Simple Line Graph in Python GUI Tutorial Steps To Create A Simple Line Graph in Python GUI Part 2 Tutorial Steps To Create Two or More Graphs in the Same Axis Tutorial Steps To Create Two Axes in One Canvas Tutorial Steps To Use Two Widgets Tutorial Steps To Use Two Widgets Each of Which Has Two Axes Tutorial Steps

To Use Axes With Certain Opacity Levels Tutorial Steps To Choose Line Color From Combo Box Tutorial Steps To Calculate Fast Fourier Transform Tutorial Steps To Create GUI For FFT Tutorial Steps To Create GUI For FFT With Some Other Input Signals Tutorial Steps To Create GUI For Noisy Signal Tutorial Steps To Create GUI For Noisy Signal Filtering and Tutorial Steps To Create GUI For Wav Signal Filtering In Chapter 3 you will learn Tutorial Steps To Convert RGB Image Into Grayscale Tutorial Steps To Convert RGB Image Into YUV Image Tutorial Steps To Convert RGB Image Into HSV Image Tutorial Steps To Filter Image Tutorial Steps To Display Image Histogram Tutorial Steps To Display Filtered Image Histogram Tutorial Steps To Filter Image With CheckBoxes Tutorial Steps To Implement Image Thresholding and Tutorial Steps To Implement Adaptive Image Thresholding You will also learn Tutorial Steps To Generate And Display Noisy Image Tutorial Steps To Implement Edge Detection On Image Tutorial Steps To Implement Image Segmentation Using Multiple Thresholding and K Means Algorithm Tutorial Steps To Implement Image Denoising Tutorial Steps To Detect Face Eye and Mouth Using Haar Cascades Tutorial Steps To Detect Face Using Haar Cascades with PyQt Tutorial Steps To Detect Eye and Mouth Using Haar Cascades with PyQt Tutorial Steps To Extract Detected Objects Tutorial Steps To Detect Image Features Using Harris Corner Detection Tutorial Steps To Detect Image Features Using Shi Tomasi Corner Detection Tutorial Steps To Detect Features Using Scale Invariant Feature Transform SIFT and Tutorial Steps To Detect Features Using Features from Accelerated Segment Test FAST In Chapter 4 In this tutorial you will learn how to use Pandas NumPy and other libraries to perform simple classification using perceptron and Adaline adaptive linear neuron The dataset used is Iris dataset directly from the UCI Machine Learning Repository You will learn Tutorial Steps To Implement Perceptron Tutorial Steps To Implement Perceptron with PyQt Tutorial Steps To Implement Adaline ADAptive LInear NEuron and Tutorial Steps To Implement Adaline with PyQt In Chapter 5 you will learn how to use the scikit learn machine learning library which provides a wide variety of machine learning algorithms via a user friendly Python API and to perform classification using perceptron Adaline adaptive linear neuron and other models The dataset used is Iris dataset directly from the UCI Machine Learning Repository You will learn Tutorial Steps To Implement Perceptron Using Scikit Learn Tutorial Steps To Implement Perceptron Using Scikit Learn with PyQt Tutorial Steps To Implement Logistic Regression Model Tutorial Steps To Implement Logistic Regression Model with PyQt Tutorial Steps To Implement Logistic Regression Model Using Scikit Learn with PyQt Tutorial Steps To Implement Support Vector Machine SVM Using Scikit Learn Tutorial Steps To Implement Decision Tree DT Using Scikit Learn Tutorial Steps To Implement Random Forest RF Using Scikit Learn and Tutorial Steps To Implement K Nearest Neighbor KNN Using Scikit Learn In Chapter 6 you will learn how to use Pandas NumPy Scikit Learn and other libraries to implement different approaches for reducing the dimensionality of a dataset using different feature selection techniques You will learn about three fundamental techniques that will help us to summarize the information content of a dataset by transforming it onto a new feature subspace of lower dimensionality than the original one

Data compression is an important topic in machine learning and it helps us to store and analyze the increasing amounts of data that are produced and collected in the modern age of technology You will learn the following topics Principal Component Analysis PCA for unsupervised data compression Linear Discriminant Analysis LDA as a supervised dimensionality reduction technique for maximizing class separability Nonlinear dimensionality reduction via Kernel Principal Component Analysis KPCA You will learn 6 1 Tutorial Steps To Implement Principal Component Analysis PCA Tutorial Steps To Implement Principal Component Analysis PCA Using Scikit Learn Tutorial Steps To Implement Principal Component Analysis PCA Using Scikit Learn with PyQt Tutorial Steps To Implement Linear Discriminant Analysis LDA Tutorial Steps To Implement Linear Discriminant Analysis LDA with Scikit Learn Tutorial Steps To Implement Linear Discriminant Analysis LDA Using Scikit Learn with PyQt Tutorial Steps To Implement Kernel Principal Component Analysis KPCA Using Scikit Learn and Tutorial Steps To Implement Kernel Principal Component Analysis KPCA Using Scikit Learn with PyQt In Chapter 7 you will learn how to use Keras Scikit Learn Pandas NumPy and other libraries to perform prediction on handwritten digits using MNIST dataset You will learn Tutorial Steps To Load MNIST Dataset Tutorial Steps To Load MNIST Dataset with PyQt Tutorial Steps To Implement Perceptron With PCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Perceptron With LDA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Perceptron With KPCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Logistic Regression LR Model With PCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Logistic Regression LR Model With LDA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Logistic Regression LR Model With KPCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Tutorial Steps To Implement Support Vector Machine SVM Model With LDA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Support Vector Machine SVM Model With KPCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Decision Tree DT Model With PCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Decision Tree DT Model With LDA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Decision Tree DT Model With KPCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Random Forest RF Model With PCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Random Forest RF Model With LDA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement Random Forest RF Model With KPCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement K Nearest Neighbor KNN Model With PCA Feature Extractor on MNIST Dataset Using PyQt Tutorial Steps To Implement K Nearest Neighbor KNN Model With LDA Feature Extractor on MNIST Dataset Using PyQt and Tutorial Steps To Implement K Nearest Neighbor KNN Model With KPCA Feature Extractor on MNIST Dataset Using PyQt **FOUR PROJECTS: PREDICTION AND FORECASTING USING MACHINE LEARNING WITH PYTHON** Vivian Siahaan,Rismon Hasiholan Sianipar,2022-05-25 PROJECT 1 GOLD PRICE ANALYSIS AND

FORECASTING USING MACHINE LEARNING WITH PYTHON The challenge of this project is to accurately predict the future adjusted closing price of Gold ETF across a given period of time in the future The problem is a regression problem because the output value which is the adjusted closing price in this project is continuous value Data for this study is collected from November 18th 2011 to January 1st 2019 from various sources The data has 1718 rows in total and 80 columns in total Data for attributes such as Oil Price Standard and Poor s S Blast Furnace Slag component 2 Fly Ash component 3 Water component 4 Superplasticizer component 5 Coarse Aggregate Fine Aggregate component 7 Age and Concrete compressive strength To perform regression on concrete compressive strength you will use Linear Regression Random Forest regression Decision Tree regression Support Vector Machine regression Na ve Bayes regression K Nearest Neighbor regression Adaboost regression Gradient Boosting regression Extreme Gradient Boosting regression Light Gradient Boosting regression Catboost regression and MLP regression To perform clustering you will use K Means algorithm The machine learning models used predict clusters as target variable are K Nearest Neighbor classifier Random Forest classifier Naive Bayes classifier Logistic Regression classifier Decision Tree classifier Support Vector Machine classifier LGBM classifier Gradient Boosting classifier XGB classifier and MLP classifier Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy PROJECT 4 DATA SCIENCE FOR SALES ANALYSIS FORECASTING CLUSTERING AND PREDICTION WITH PYTHON The dataset used in this project is from Walmart which is a renowned retail corporation that operates a chain of hypermarkets Walmart has provided a data combining of 45 stores including store information and monthly sales The data is provided on weekly basis Walmart tries to find the impact of holidays on the sales of store For which it has included four holidays weeks into the dataset which are Christmas Thanksgiving Super bowl Labor Day In this project you are going to analyze forecast weekly sales perform clustering and predict the resulting clusters The dataset covers sales from 2010 02 05 to 2012 11 01 Following are the attributes in the dataset Store the store number Date the week of sales Weekly_Sales sales for the given store Holiday_Flag whether the week is a special holiday week 1 Holiday week 0 Non holiday week Temperature Temperature on the day of sale Fuel_Price Cost of fuel in the region CPI Prevailing consumer price index and Unemployment Prevailing unemployment rate To perform regression on weekly sales you will use Linear Regression Random Forest regression Decision Tree regression Support Vector Machine regression Na ve Bayes regression K Nearest Neighbor regression Adaboost regression Gradient Boosting regression Extreme Gradient Boosting regression Light Gradient Boosting regression Catboost regression and MLP regression To perform clustering you will use K Means algorithm The machine learning models used predict clusters as target variable are K Nearest Neighbor classifier Random Forest classifier Naive Bayes classifier Logistic Regression classifier Decision Tree classifier Support Vector Machine classifier LGBM classifier Gradient Boosting classifier XGB

classifier and MLP classifier Finally you will plot boundary decision distribution of features feature importance cross validation score and predicted values versus true values confusion matrix learning curve performance of the model scalability of the model training loss and training accuracy Hands-On Guide On Data Science and Machine Learning with Python GUI Vivian Siahaan,2021-07-08 In this book you will implement two data science projects using Scikit Learn Scipy and other libraries with Python GUI In Chapter 1 you will learn how to use Scikit Learn Scipy and other libraries to perform how to predict traffic number of vehicles in four different junctions using Traffic Prediction Dataset provided by Kaggle https www kaggle com fedesoriano traffic prediction dataset download This dataset contains 48 1k 48120 observations of the number of vehicles each hour in four different junctions 1 DateTime 2 Juction 3 Vehicles and 4 ID In Chapter 2 you will learn how to use Scikit Learn NumPy Pandas and other libraries to perform how to analyze and predict heart attack using Heart Attack Analysis Prediction Dataset provided by Kaggle https www kaggle com rashikrahmanpritom heart attack analysis prediction dataset download In Chapter 3 you will learn how to use Scikit Learn SVM NumPy Pandas and other libraries to perform how to predict early stage diabetes using Early Stage Diabetes Risk Prediction Dataset provided by Kaggle https www kaggle com ishandutta early stage diabetes risk prediction dataset download This dataset contains the sign and symptpom data of newly diabetic or would be diabetic patient This has been collected using direct questionnaires from the patients of Sylhet Diabetes Hospital in Sylhet Bangladesh and approved by a doctor *Personal Computing* ,1983 **EMOTION PREDICTION FROM TEXT USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON GUI** Vivian Siahaan,Rismon Hasiholan Sianipar,2023-06-28 This is a captivating book that delves into the intricacies of building a robust system for emotion detection in textual data Throughout this immersive exploration readers are introduced to the methodologies challenges and breakthroughs in accurately discerning the emotional context of text The book begins by highlighting the importance of emotion detection in various domains such as social media analysis customer sentiment evaluation and psychological research Understanding human emotions in text is shown to have a profound impact on decision making processes and enhancing user experiences Readers are then guided through the crucial stages of data preprocessing where text is carefully cleaned tokenized and transformed into meaningful numerical representations using techniques like Count Vectorization TF IDF Vectorization and Hashing Vectorization Traditional machine learning models including Logistic Regression Random Forest XGBoost LightGBM and Convolutional Neural Network CNN are explored to provide a foundation for understanding the strengths and limitations of conventional approaches However the focus of the book shifts towards the Long Short Term Memory LSTM model a powerful variant of recurrent neural networks Leveraging word embeddings the LSTM model adeptly captures semantic relationships and long term dependencies present in text showcasing its potential in emotion detection The LSTM model s exceptional performance is revealed achieving an astounding accuracy of 86% on the test dataset Its ability to grasp intricate emotional nuances ingrained in textual data is demonstrated highlighting its

effectiveness in capturing the rich tapestry of human emotions In addition to the LSTM model the book also explores the Convolutional Neural Network CNN model which exhibits promising results with an accuracy of 85% on the test dataset The CNN model excels in capturing local patterns and relationships within the text providing valuable insights into emotion detection To enhance usability an intuitive training and predictive interface is developed enabling users to train their own models on custom datasets and obtain real time predictions for emotion detection This interactive interface empowers users with flexibility and accessibility in utilizing the trained models The book further delves into the performance comparison between the LSTM model and traditional machine learning models consistently showcasing the LSTM model s superiority in capturing complex emotional patterns and contextual cues within text data Future research directions are explored including the integration of pre trained language models such as BERT and GPT ensemble techniques for further improvements and the impact of different word embeddings on emotion detection Practical applications of the developed system and models are discussed ranging from sentiment analysis and social media monitoring to customer feedback analysis and psychological research Accurate emotion detection unlocks valuable insights empowering decision making processes and fostering meaningful connections In conclusion this project encapsulates a transformative expedition into understanding human emotions in text By harnessing the power of machine learning techniques the book unlocks the potential for accurate emotion detection empowering industries to make data driven decisions foster connections and enhance user experiences This book serves as a beacon for researchers practitioners and enthusiasts venturing into the captivating world of emotion detection in text **DATA VISUALIZATION, TIME-SERIES FORECASTING, AND PREDICTION USING MACHINE LEARNING WITH TKINTER** Vivian Siahaan,Rismon Hasiholan Sianipar,2023-09-06 This Data Visualization Time Series Forecasting and Prediction using Machine Learning with Tkinter project is a comprehensive and multifaceted application that leverages data visualization time series forecasting and machine learning techniques to gain insights into bitcoin data and make predictions This project serves as a valuable tool for financial analysts traders and investors seeking to make informed decisions in the stock market The project begins with data visualization where historical bitcoin market data is visually represented using various plots and charts This provides users with an intuitive understanding of the data s trends patterns and fluctuations Features distribution analysis is conducted to assess the statistical properties of the dataset helping users identify key characteristics that may impact forecasting and prediction One of the project s core functionalities is time series forecasting Through a user friendly interface built with Tkinter users can select a stock symbol and specify the time horizon for forecasting The project supports multiple machine learning regressors such as Linear Regression Decision Trees Random Forests Gradient Boosting Extreme Gradient Boosting Multi Layer Perceptron Lasso Ridge AdaBoost and KNN allowing users to choose the most suitable algorithm for their forecasting needs Time series forecasting is crucial for making predictions about stock prices which is essential for investment strategies The project employs various machine learning regressors to

predict the adjusted closing price of bitcoin stock By training these models on historical data users can obtain predictions for future adjusted closing prices This information is invaluable for traders and investors looking to make buy or sell decisions The project also incorporates hyperparameter tuning and cross validation to enhance the accuracy of these predictions These models employ metrics such as Mean Absolute Error MAE which quantifies the average absolute discrepancy between predicted values and actual values Lower MAE values signify superior model performance Additionally Mean Squared Error MSE is used to calculate the average squared differences between predicted and actual values with lower MSE values indicating better model performance Root Mean Squared Error RMSE derived from MSE provides insights in the same units as the target variable and is valued for its lower values denoting superior performance Lastly R squared R2 evaluates the fraction of variance in the target variable that can be predicted from independent variables with higher values signifying better model fit An R2 of 1 implies a perfect model fit In addition to close price forecasting the project extends its capabilities to predict daily returns By implementing grid search users can fine tune the hyperparameters of machine learning models such as Random Forests Gradient Boosting Support Vector Decision Tree Gradient Boosting Extreme Gradient Boosting Multi Layer Perceptron and AdaBoost Classifiers This optimization process aims to maximize the predictive accuracy of daily returns Accurate daily return predictions are essential for assessing risk and formulating effective trading strategies Key metrics in these classifiers encompass Accuracy which represents the ratio of correctly predicted instances to the total number of instances Precision which measures the proportion of true positive predictions among all positive predictions and Recall also known as Sensitivity or True Positive Rate which assesses the proportion of true positive predictions among all actual positive instances The F1 Score serves as the harmonic mean of Precision and Recall offering a balanced evaluation especially when considering the trade off between false positives and false negatives The ROC Curve illustrates the trade off between Recall and False Positive Rate while the Area Under the ROC Curve AUC ROC summarizes this trade off The Confusion Matrix provides a comprehensive view of classifier performance by detailing true positives true negatives false positives and false negatives facilitating the computation of various metrics like accuracy precision and recall The selection of these metrics hinges on the project s specific objectives and the characteristics of the dataset ensuring alignment with the intended goals and the ramifications of false positives and false negatives which hold particular significance in financial contexts where decisions can have profound consequences Overall the Data Visualization Time Series Forecasting and Prediction using Machine Learning with Tkinter project serves as a powerful and user friendly platform for financial data analysis and decision making It bridges the gap between complex machine learning techniques and accessible user interfaces making financial analysis and prediction more accessible to a broader audience With its comprehensive features this project empowers users to gain insights from historical data make informed investment decisions and develop effective trading strategies in the dynamic world of finance You can download the dataset from http viviansiahaan blogspot com 2023 09 data

visualization time series html TKINTER, DATA SCIENCE, AND MACHINE LEARNING Vivian Siahaan,Rismon Hasiholan Sianipar,2023-09-02 In this project we embarked on a comprehensive journey through the world of machine learning and model evaluation Our primary goal was to develop a Tkinter GUI and assess various machine learning models on a given dataset to identify the best performing one This process is essential in solving real world problems as it helps us select the most suitable algorithm for a specific task By crafting this Tkinter powered GUI we provided an accessible and user friendly interface for users engaging with machine learning models It simplified intricate processes allowing users to load data select models initiate training and visualize results without necessitating code expertise or command line operations This GUI introduced a higher degree of usability and accessibility to the machine learning workflow accommodating users with diverse levels of technical proficiency We began by loading and preprocessing the dataset a fundamental step in any machine learning project Proper data preprocessing involves tasks such as handling missing values encoding categorical features and scaling numerical attributes These operations ensure that the data is in a format suitable for training and testing machine learning models Once our data was ready we moved on to the model selection phase We evaluated multiple machine learning algorithms each with its strengths and weaknesses The models we explored included Logistic Regression Random Forest K Nearest Neighbors KNN Decision Trees Gradient Boosting Extreme Gradient Boosting XGBoost Multi Layer Perceptron MLP and Support Vector Classifier SVC For each model we employed a systematic approach to find the best hyperparameters using grid search with cross validation This technique allowed us to explore different combinations of hyperparameters and select the configuration that yielded the highest accuracy on the training data These hyperparameters included settings like the number of estimators learning rate and kernel function depending on the specific model After obtaining the best hyperparameters for each model we trained them on our preprocessed dataset This training process involved using the training data to teach the model to make predictions on new unseen examples Once trained the models were ready for evaluation We assessed the performance of each model using a set of well established evaluation metrics These metrics included accuracy precision recall and F1 score Accuracy measured the overall correctness of predictions while precision quantified the proportion of true positive predictions out of all positive predictions Recall on the other hand represented the proportion of true positive predictions out of all actual positives highlighting a model s ability to identify positive cases The F1 score combined precision and recall into a single metric helping us gauge the overall balance between these two aspects To visualize the model s performance we created key graphical representations These included confusion matrices which showed the number of true positive true negative false positive and false negative predictions aiding in understanding the model s classification results Additionally we generated Receiver Operating Characteristic ROC curves and area under the curve AUC scores which depicted a model s ability to distinguish between classes High AUC values indicated excellent model performance Furthermore we constructed true values versus predicted values diagrams to provide insights into how well our

models aligned with the actual data distribution Learning curves were also generated to observe a model s performance as a function of training data size helping us assess whether the model was overfitting or underfitting Lastly we presented the results in a clear and organized manner saving them to Excel files for easy reference This allowed us to compare the performance of different models and make an informed choice about which one to select for our specific task In summary this project was a comprehensive exploration of the machine learning model development and evaluation process We prepared the data selected and fine tuned various models assessed their performance using multiple metrics and visualizations and ultimately arrived at a well informed decision about the most suitable model for our dataset This approach serves as a valuable blueprint for tackling real world machine learning challenges effectively

Unveiling the Magic of Words: A Overview of "**Machine Language Programming Cookbook**"

In a global defined by information and interconnectivity, the enchanting power of words has acquired unparalleled significance. Their capability to kindle emotions, provoke contemplation, and ignite transformative change is actually awe-inspiring. Enter the realm of "**Machine Language Programming Cookbook**," a mesmerizing literary masterpiece penned with a distinguished author, guiding readers on a profound journey to unravel the secrets and potential hidden within every word. In this critique, we shall delve to the book is central themes, examine its distinctive writing style, and assess its profound affect the souls of its readers.

Table of Contents Machine Language Programming Cookbook

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