



Matlab Projects for Engineering Students

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Matlab Projects For Engineering Students:

Octave and MATLAB for Engineering Applications Andreas Stahel, 2022-05-28 For many engineering tasks extensive computations or visualizations are required. The well established Matlab and Octave, a very similar open source software, are excellent tools for modeling, computing, and visualization. This book will help the reader to acquire basic knowledge and elementary programming skills with Octave. Matlab Basic data and programming structures are presented, and for the most often used commands illustrative code samples are provided. The selection of the presented commands is guided by the typical needs of engineers. With these skills, many and more difficult problems can be solved successfully. It is shown how basic statistical questions can be answered and how results are visualized using appropriate types of graphical representation. A selection of typical independent engineering problems is presented together with algorithms to solve these problems. Special attention is given to the methods of linear and nonlinear regression. The high level tool Matlab/Octave is used to develop computational code for micro controllers. The codes and data files for the book are available on Github and on Springer Link. **Target Groups:** Students in electrical and mechanical engineering and engineering fields in general. **Working engineers.**

An Inquiry-Based Introduction to Engineering Michelle Blum, 2022-09-20 The text introduces engineering to first year undergraduate students using Inquiry Based Learning (IBL). It draws on several different inquiry based instruction types such as confirmation inquiry, structured inquiry, guided inquiry, and open inquiry, and all of their common elements. Professor Blum's approach emphasizes the student's role in the learning process, empowering them in the classroom to explore the material, ask questions, and share ideas instead of the instructor lecturing to passive learners about what they need to know. Beginning with a preface to IBL, the book is organized into three parts, each consisting of four to ten chapters. Each chapter has a dedicated topic where an initial few paragraphs of introductory or fundamental material are provided. This is followed by a series of focused questions that guide the students' learning about the concepts being taught. Featuring multiple inquiry based strategies, each most appropriate to the topic, *An Inquiry Based Approach to Introduction to Engineering* stands as an easy to use textbook that quickly allows students to actively engage with the content during every class period.

Programming Projects in C for Students of Engineering, Science, and Mathematics Rouben Rostamian, 2014-09-03 Like a pianist who practices from a book of études, readers of *Programming Projects in C for Students of Engineering, Science, and Mathematics* will learn by doing. Written as a tutorial on how to think about, organize, and implement programs in scientific computing, this book achieves its goal through an eclectic and wide ranging collection of projects. Each project presents a problem and an algorithm for solving it. The reader is guided through implementing the algorithm in C and compiling and testing the results. It is not necessary to carry out the projects in sequential order. The projects contain suggested algorithms and partially completed programs for implementing them to enable the reader to exercise and develop skills in scientific computing. Only a working knowledge of undergraduate multivariable calculus

differential equations and linear algebra and are written in platform independent standard C the Unix command line is used to illustrate compilation and execution

Projects in Electrical, Electronics, instrumentation and Computer Engineering SK Bhattacharya | S Chatterjee, The objective of this book has been to provide the students with reference material to select and work on doing various projects related to their subjects of study The projects included in this book have been tried out and hence are realistic The selection of the projects has been done carefully to reflect the real life job situations and also to develop in students the higher order intellectual abilities i e their capability to analyze synthesize and decision making through real life like project activities Key Features All Projects are real life like Projects included have been tried out by the authors Includes variety of projects from interdisciplinary areas

Matlab - Modelling, Programming and Simulations Emilson Pereira Leite, 2010

FIVE PROJECTS: SQLITE AND PYTHON GUI FOR DATA ANALYSIS Vivian Siahaan, Rismon Hasiholan Sianipar, 2022-11-03

PROJECT 1 FULL SOURCE CODE PRACTICAL DATA SCIENCE WITH SQLITE AND PYTHON GUI In this project we provide you with the SQLite sample database named chinook The chinook sample database is a good database for practicing with SQL especially SQLite The detailed description of the database can be found on <https://www.sqlitetutorial.net/sqlite-sample-database/> There are 11 tables in the chinook sample database The employee table stores employees data such as employee id last name first name etc It also has a field named ReportsTo to specify who reports to whom customers table stores customers data invoices The artist table stores artists data It is a simple table that contains only the artist id and name The album table stores data about a list of tracks Each album belongs to one artist However one artist may have multiple albums The media_type table stores media types such as MPEG audio and AAC audio files genre table stores music types such as rock jazz metal etc The track table stores the data of songs Each track belongs to one album playlist the distribution of amount by year quarter month week day and hour the bottom top 10 sales by employee the bottom top 10 sales by customer the bottom top 10 sales by customer the bottom top 10 sales by artist the bottom top 10 sales by genre the bottom top 10 sales by play list the bottom top 10 sales by customer city the bottom top 10 sales by customer city the bottom top 10 sales by customer city the payment amount by month with mean and EWM the average payment amount by every month and amount payment in all years

PROJECT 2 FULL SOURCE CODE SQLITE FOR STUDENTS AND PROGRAMMERS WITH PYTHON GUI In this project we provide you with a SQLITE version of an Oracle sample database named OT which is based on a global fictitious company that sells computer hardware including storage motherboard RAM video card and CPU You can find the detailed structures of the database <https://www.oracletutorial.com/getting-started/oracle-sample-database/> The company maintains the product information such as name description standard cost list price and product line It also tracks the inventory information for all products including warehouses where products are available Because the company operates globally it has warehouses in various locations around the world The company records all customer information including name address and website Each customer has at least one contact person with

detailed information including name email and phone The company also places a credit limit on each customer to limit the amount that customer can owe Whenever a customer issues a purchase order a sales order is created in the database with the pending status When the company ships the order the order status becomes shipped In case the customer cancels an order the order status becomes canceled In addition to the sales information the employee data is recorded with some basic information such as name email phone job title manager and hire date In this project you will write Python script to create every table and insert rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of order date by year quarter month week and day the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by category top 10 sales by category bottom 10 sales by status top 10 sales by status bottom 10 sales by customer city top 10 sales by customer city bottom 10 sales by customer state top 10 sales by customer state average amount by month with mean and EWM average amount by every month amount feature over June 2016 amount feature over 2017 and amount payment in all years

PROJECT 3 SQLITE FOR DATA ANALYST AND DATA SCIENTIST WITH PYTHON GUI

In this project we will use the SQLite version of BikeStores database as a sample database to help you work with MySQL quickly and effectively The stores table includes the store s information Each store has a store name contact information such as phone and email and an address including street city state and zip code The staffs table stores the essential information of staffs including first name last name It also contains the communication information such as email and phone A staff works at a store specified by the value in the store_id column A store can have one or more staffs A staff reports to a store manager specified by the value in the manager_id column If the value in the manager_id is null then the staff is the top manager If a staff no longer works for any stores the value in the active column is set to zero The categories table stores the bike s categories such as children bicycles comfort bicycles and electric bikes The products table stores the product s information such as name brand category model year and list price Each product belongs to a brand specified by the brand_id column Hence a brand may have zero or many products Each product also belongs a category specified by the category_id column Also each category may have zero or many products The customers table stores customer s information including first name last name phone email street city state zip code and photo path The orders table stores the sales order s header information including customer order status order date required date shipped date It also stores the information on where the sales transaction was created store and who created it staff Each sales order has a row in the sales_orders table A sales order has one or many line items stored in the order_items table The order_items table stores the line items of a sales order Each line item belongs to a sales order specified by the order_id column A sales order line item includes product order quantity list price and discount The stocks table stores the inventory information i e the quantity of a particular product in a specific store In this project you will write Python script to create every table and insert

rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of order date by year quarter month week day and hour the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by category top 10 sales by category bottom 10 sales by brand top 10 sales by brand bottom 10 sales by customer city top 10 sales by customer city bottom 10 sales by customer state top 10 sales by customer state average amount by month with mean and EWM average amount by every month amount feature over June 2017 amount feature over 2018 and all amount feature PROJECT 4 SQLITE FOR DATA ANALYSIS AND VISUALIZATION WITH PYTHON GUI In this project you will use SQLite version of Northwind database which is a sample database that was originally created by Microsoft and used as the basis for their tutorials in a variety of database products for decades The Northwind database contains the sales data for a fictitious company called Northwind Traders which imports and exports specialty foods from around the world The Northwind database is an excellent tutorial schema for a small business ERP with customers orders inventory purchasing suppliers shipping employees and single entry accounting The Northwind dataset includes sample data for the following Suppliers Suppliers and vendors of Northwind Customers Customers who buy products from Northwind Employees Employee details of Northwind traders Products Product information Shippers The details of the shippers who ship the products from the traders to the end customers Orders and Order_Details Sales Order transactions taking place between the customers the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by supplier top 10 sales by supplier bottom 10 sales by customer country top 10 sales by customer country bottom 10 sales by supplier country top 10 sales by supplier country average amount by month with mean and ewm average amount by every month amount feature over June 1997 amount feature over 1998 and all amount feature PROJECT 5 ZERO TO MASTERY THE COMPLETE GUIDE TO LEARNING SQLITE AND PYTHON GUI In this project we provide you with the SQLite version of The Oracle Database Sample Schemas that provides a common platform for examples in each release of the Oracle Database The sample database is also a good database for practicing with SQL especially SQLite The detailed description of the database can be found on <http://luna.ext.oracle.com/server/112/e10831/diagrams.htm> insertedID0 The four schemas are a set of interlinked schemas This set of schemas provides a layered approach to complexity A simple schema Human Resources HR is useful for introducing basic topics An extension to this schema supports Oracle Internet Directory demos A second schema Order Entry OE is useful for dealing with matters of intermediate complexity Many data types are available in this schema including non scalar data types The Online Catalog OC subschema is a collection of object relational database objects built inside the OE schema The Product Media PM schema is dedicated to multimedia data types The Sales History SH schema is designed to allow for demos with large amounts of data An extension to this schema provides support for advanced analytic

processing The HR schema consists of seven tables regions countries locations departments employees jobs and job_histories

This book only implements HR schema since the other schemas will be implemented in the next books **FIVE PROJECTS:**

POSTGRESQL AND PYTHON GUI FOR DATA ANALYSIS Vivian Siahaan,Rismon Hasiholan Sianipar,2022-11-03

PROJECT 1 ZERO TO MASTERY THE COMPLETE GUIDE TO LEARNING POSTGRESQL WITH PYTHON GUI This book uses the PostgreSQL version of MySQL based Northwind database The Northwind database is a sample database that was originally created by Microsoft and used as the basis for their tutorials in a variety of database products for decades The Northwind database contains the sales data for a fictitious company called Northwind Traders which imports and exports specialty foods from around the world The Northwind database is an excellent tutorial schema for a small business ERP with customers orders inventory purchasing suppliers shipping employees and single entry accounting The Northwind database has since been ported to a variety of non Microsoft databases including PostgreSQL The Northwind dataset includes sample data for the following Suppliers Suppliers and vendors of Northwind Customers Customers who buy products from Northwind Employees Employee details of Northwind traders Products Product information Shippers The details of the shippers who ship the products from the traders to the end customers and Orders and Order_Details Sales Order transactions taking place between the customers the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by supplier top 10 sales by supplier bottom 10 sales by customer country top 10 sales by customer country bottom 10 sales by supplier country top 10 sales by supplier country average amount by month with mean and ewm average amount by every month amount feature over June 1997 amount feature over 1998 and all amount feature **PROJECT 2 FULL SOURCE CODE POSTGRESQL AND DATA SCIENCE FOR PROGRAMMERS WITH PYTHON GUI** This project uses the PostgreSQL version of MySQL based Sakila sample database which is a fictitious database designed to represent a DVD rental store The tables of the database include film film_category actor film_actor customer rental payment and inventory among others You can download the database from <https://dev.mysql.com/doc/sakila/en> In this project you will write Python script to create every table and insert rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of film release year film rating rental duration and categorize film length plot rating variable against rental_duration variable in stacked bar plots plot length variable against rental_duration variable in stacked bar plots read payment table plot case distribution of Year Day Month Week and Quarter of payment plot which year month week days of week and quarter have most payment amount read film list by joining five tables category film_category film_actor film and actor plot case distribution of top 10 and bottom 10 actors plot which film title have least and most sales plot which actor have least and most sales plot which film category have least and most sales plot case distribution of top 10 and bottom 10 overdue costumers plot which store have most sales plot average payment amount by

month with mean and EWM and plot payment amount over June 2005

PROJECT 3 FULL SOURCE CODE POSTGRESQL FOR DATA ANALYTICS AND VISUALIZATION WITH PYTHON GUI

In this project we provide you with a PostgreSQL version of an Oracle sample database named OT which is based on a global fictitious company that sells computer hardware including storage motherboard RAM video card and CPU The company maintains the product information such as name description standard cost list price and product line It also tracks the inventory information for all products including warehouses where products are available Because the company operates globally it has warehouses in various locations around the world The company records all customer information including name address and website Each customer has at least one contact person with detailed information including name email and phone The company also places a credit limit on each customer to limit the amount that customer can owe Whenever a customer issues a purchase order a sales order is created in the database with the pending status When the company ships the order the order status becomes shipped In case the customer cancels an order the order status becomes canceled In addition to the sales information the employee data is recorded with some basic information such as name email phone job title manager and hire date In this project you will write Python script to create every table and insert rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of order date by year quarter month week and day the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by category top 10 sales by category bottom 10 sales by status top 10 sales by status bottom 10 sales by customer city top 10 sales by customer city bottom 10 sales by customer state top 10 sales by customer state average amount by month with mean and EWM average amount by every month amount feature over June 2016 amount feature over 2017 and amount payment in all years

PROJECT 4 FULL SOURCE CODE POSTGRESQL FOR DATA SCIENTISTS AND DATA ANALYSTS WITH PYTHON GUI

In this project we will use the PostgreSQL version of SQL Server based BikeStores as a sample database to help you work with PostgreSQL quickly and effectively The detailed structure of database can be found at <https://www.sqlservertutorial.net/sql-server-sample-database/> The stores table includes the store s information Each store has a store name contact information such as phone and email and an address including street city state and zip code The staffs table stores the essential information of staffs including first name last name It also contains the communication information such as email and phone A staff works at a store specified by the value in the store_id column A store can have one or more staffs A staff reports to a store manager specified by the value in the manager_id column If the value in the manager_id is null then the staff is the top manager If a staff no longer works for any stores the value in the active column is set to zero The categories table stores the bike s categories such as children bicycles comfort bicycles and electric bikes The products table stores the product s information such as name brand category model year and list price Each product belongs to a brand specified by the brand_id column Hence a brand

may have zero or many products Each product also belongs a category specified by the category_id column Also each category may have zero or many products The customers table stores customer s information including first name last name phone email street city state zip code and photo path The orders table stores the sales order s header information including customer order status order date required date shipped date It also stores the information on where the sales transaction was created store and who created it staff Each sales order has a row in the sales_orders table A sales order has one or many line items stored in the order_items table The order_items table stores the line items of a sales order Each line item belongs to a sales order specified by the order_id column A sales order line item includes product order quantity list price and discount The stocks table stores the inventory information i e the quantity of a particular product in a specific store In this project you will write Python script to create every table and insert rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of order date by year quarter month week day and hour the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by category top 10 sales by category bottom 10 sales by brand top 10 sales by brand bottom 10 sales by customer city top 10 sales by customer city bottom 10 sales by customer state top 10 sales by customer state average amount by month with mean and EWM average amount by every month amount feature over June 2017 amount feature over 2018 and all amount feature PROJECT 5 FULL SOURCE CODE THE COMPLETE GUIDE TO LEARNING POSTGRESQL AND DATA SCIENCE WITH PYTHON GUI In this project we provide you with the PostgreSQL version of SQLite sample database named chinook The chinook sample database is a good database for practicing with SQL especially PostgreSQL The detailed description of the database can be found on <https://www.sqlitetutorial.net/sqlite-sample-database/> The sample database consists of 11 tables The employee table stores employees data such as employee id last name first name etc It also has a field named ReportsTo to specify who reports to whom customers table stores customers data invoices The artist table stores artists data It is a simple table that contains only the artist id and name The album table stores data about a list of tracks Each album belongs to one artist However one artist may have multiple albums The media_type table stores media types such as MPEG audio and AAC audio files genre table stores music types such as rock jazz metal etc The track table stores the data of songs Each track belongs to one album playlist the distribution of amount by year quarter month week day and hour the bottom top 10 sales by employee the bottom top 10 sales by customer the bottom top 10 sales by customer the bottom top 10 sales by artist the bottom top 10 sales by genre the bottom top 10 sales by play list the bottom top 10 sales by customer city the bottom top 10 sales by customer city the bottom top 10 sales by customer city the payment amount by month with mean and EWM the average payment amount by every month and amount payment in all years 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 3168 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 to 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` (centroid frequency), `see` (specprop), `peakf` (peak frequency), `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

FOUR PROJECTS: MYSQL AND PYTHON GUI FOR DATA ANALYSIS Vivian Siahaan, Rismon Hasiholan Sianipar, 2022-11-04

PROJECT 1 FULL SOURCE CODE MYSQL FOR STUDENTS AND PROGRAMMERS WITH PYTHON GUI

In this project we provide you with a MySQL version of an Oracle sample database named OT which is based on a global fictitious company that sells computer hardware including storage motherboard RAM video card and CPU The company maintains the product information such as name description standard cost list price and product line It also tracks the inventory information for all products including warehouses where products are available Because the company operates globally it has warehouses in various locations around the world The company records all customer information including name address and website Each customer has at least one contact person with detailed information including name email and phone The company also places a credit limit on each customer to limit the amount that customer can owe Whenever a customer issues a purchase order a sales order is created in the database with the pending status When the company ships the order the order status becomes shipped In case the customer cancels an order the order status becomes canceled In addition to the sales information the employee data is recorded with some basic information such as name email phone job title manager and hire date In this project you will write Python script to create every table and insert rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of order date by year quarter month week and day the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by category top 10 sales by category bottom 10 sales by status top 10 sales by status bottom 10 sales by customer city top 10 sales by customer city bottom 10 sales by customer state top 10 sales by customer state average amount by month with mean and EWM average amount by every month amount feature over June 2016 amount feature over 2017 and amount payment in all years

PROJECT 2 MYSQL FOR DATA ANALYST AND DATA SCIENTIST WITH PYTHON GUI

In this project we will use the BikeStores database as a MySQL sample database to help you work with MySQL quickly and effectively The stores table includes the store s information Each store has a store name contact information such as phone and email and an address including street city state and zip code The staffs table stores the essential information of staffs including first name last name It also contains the communication information such as email and phone A staff works at a store specified by the value in the store_id column A store can have one or more staffs A staff reports to a store manager specified by the value in the manager_id column If the value in the manager_id is null then the staff is the top manager If a staff no longer works for any stores the value in the active column is set to zero The categories table stores the bike s categories such as children bicycles comfort bicycles and electric bikes The products table stores the product s information such as name brand category model year and list price Each product belongs to a brand

specified by the brand_id column Hence a brand may have zero or many products Each product also belongs a category specified by the category_id column Also each category may have zero or many products The customers table stores customer s information including first name last name phone email street city state zip code and photo path The orders table stores the sales order s header information including customer order status order date required date shipped date It also stores the information on where the sales transaction was created store and who created it staff Each sales order has a row in the sales_orders table A sales order has one or many line items stored in the order_items table The order_items table stores the line items of a sales order Each line item belongs to a sales order specified by the order_id column A sales order line item includes product order quantity list price and discount The stocks table stores the inventory information i e the quantity of a particular product in a specific store In this project you will write Python script to create every table and insert rows of data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of order date by year quarter month week day and hour the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by category top 10 sales by category bottom 10 sales by brand top 10 sales by brand bottom 10 sales by customer city top 10 sales by customer city bottom 10 sales by customer state top 10 sales by customer state average amount by month with mean and EWM average amount by every month amount feature over June 2017 amount feature over 2018 and all amount feature PROJECT 3 MYSQL FOR DATA ANALYSIS AND VISUALIZATION WITH PYTHON GUI In this project you will use the Northwind database which is a sample database that was originally created by Microsoft and used as the basis for their tutorials in a variety of database products for decades The Northwind database contains the sales data for a fictitious company called Northwind Traders which imports and exports specialty foods from around the world The Northwind database is an excellent tutorial schema for a small business ERP with customers orders inventory purchasing suppliers shipping employees and single entry accounting The Northwind dataset includes sample data for the following Suppliers Suppliers and vendors of Northwind Customers Customers who buy products from Northwind Employees Employee details of Northwind traders Products Product information Shippers The details of the shippers who ship the products from the traders to the end customers Orders and Order_Details Sales Order transactions taking place between the customers the distribution of amount by year quarter month week day and hour the distribution of bottom 10 sales by product top 10 sales by product bottom 10 sales by customer top 10 sales by customer bottom 10 sales by supplier top 10 sales by supplier bottom 10 sales by customer country top 10 sales by customer country bottom 10 sales by supplier country top 10 sales by supplier country average amount by month with mean and ewm average amount by every month amount feature over june 1997 amount feature over 1998 and all amount feature PROJECT 4 MYSQL AND DATA SCIENCE QUERIES AND VISUALIZATION WITH PYTHON GUI In this project you will write Python script to create every table and insert rows of

data into each of them You will develop GUI with PyQt5 to each table in the database You will also create GUI to plot case distribution of film release year film rating rental duration and categorize film length plot rating variable against rental_duration variable in stacked bar plots plot length variable against rental_duration variable in stacked bar plots read payment table plot case distribution of Year Day Month Week and Quarter of payment plot which year month week days of week and quarter have most payment amount read film list by joining five tables category film_category film_actor film and actor plot case distribution of top 10 and bottom 10 actors plot which film title have least and most sales plot which actor have least and most sales plot which film category have least and most sales plot case distribution of top 10 and bottom 10 overdue costumers plot which customer have least and most overdue days plot which store have most sales plot average payment amount by month with mean and EWM and plot payment amount over June 2005 This project uses the Sakila sample database which is a fictitious database designed to represent a DVD rental store The tables of the database include film film_category actor film_actor customer rental payment and inventory among others You can download the MySQL from <https://dev.mysql.com/doc/sakila/en>

Introduction To Numerical Computation, An (Second Edition) Wen Shen, 2019-08-28 This book serves as a set of lecture notes for a senior undergraduate level course on the introduction to numerical computation which was developed through 4 semesters of teaching the course over 10 years The book requires minimum background knowledge from the students including only a three semester of calculus and a bit on matrices The book covers many of the introductory topics for a first course in numerical computation which fits in the short time frame of a semester course Topics range from polynomial approximations and interpolation to numerical methods for ODEs and PDEs Emphasis was made more on algorithm development basic mathematical ideas behind the algorithms and the implementation in Matlab The book is supplemented by two sets of videos available through the author's YouTube channel Homework problem sets are provided for each chapter and complete answer sets are available for instructors upon request The second edition contains a set of selected advanced topics written in a self contained manner suitable for self learning or as additional material for an honored version of the course Videos are also available for these added topics

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