

sql projects for data science

SQL Projects for Data Science: Unlocking the Power of Data with Query Mastery

sql projects for data science are an essential part of any data scientist's toolkit. While many associate data science primarily with Python, R, and machine learning algorithms, SQL remains a foundational skill that allows professionals to efficiently manage, manipulate, and extract insights from vast datasets. In fact, tackling hands-on SQL projects is one of the best ways to deepen your understanding of databases and enhance your ability to work with real-world data.

If you're looking to sharpen your data querying skills or build a portfolio that stands out, diving into SQL projects specifically tailored for data science can be incredibly rewarding. This article explores various types of SQL projects, practical tips, and how they integrate with broader data science workflows.

Why SQL is Crucial for Data Science

Before jumping into specific projects, it's important to recognize why SQL holds such value in the data science landscape. SQL (Structured Query Language) is the standard language for relational database management systems. Virtually every organization stores data in relational databases like MySQL, PostgreSQL, or Microsoft SQL Server. Data scientists need SQL to:

- Access and retrieve data efficiently without relying solely on data exports.
- Perform complex data transformations and aggregations directly in the database.
- Join multiple tables to create meaningful datasets for analysis.
- Clean and preprocess data before feeding it into machine learning models.

Mastering SQL boosts productivity because it reduces the need to extract entire datasets and perform manipulations in external tools. Instead, you can write optimized queries that run on the database server, saving time and computational resources.

Types of SQL Projects for Data Science

The best SQL projects for data science are those that simulate real-world scenarios where you'd need to analyze, clean, or prepare data for deeper insights. Below are some popular project ideas that can help you build practical skills.

1. Data Exploration and Reporting

A classic type of project involves exploring a dataset using SQL queries to generate meaningful reports. For example, you could work with a retail sales database and write queries to:

- Calculate total sales per region or product category.
- Identify top-performing customers.
- Track monthly revenue trends.
- Determine inventory turnover rates.

This kind of project encourages you to use aggregate functions (SUM, COUNT, AVG), grouping (GROUP BY), filtering (WHERE, HAVING), and sorting (ORDER BY). It also helps you develop a keen eye for spotting patterns directly in the database.

2. Data Cleaning and Preprocessing with SQL

Data scientists often face messy data that requires cleaning before analysis. SQL offers powerful tools for data cleansing such as:

- Removing duplicates using DISTINCT or ROW_NUMBER() window functions.
- Handling missing or NULL values with COALESCE or CASE statements.
- Standardizing text fields with string functions like LOWER(), UPPER(), TRIM().
- Converting data types and formatting dates.

By undertaking projects focused on data preprocessing, you'll get comfortable writing conditional logic and transforming raw data into a usable format. For instance, cleaning customer contact details, normalizing product names, or flagging inconsistent entries are common tasks.

3. Advanced SQL Queries with Window Functions and CTEs

As you progress, working on projects that leverage advanced SQL features can set you apart. Window functions (such as RANK(), ROW_NUMBER(), LAG(), LEAD()) allow you to perform calculations across sets of rows related to the current row without collapsing the result set. Similarly, Common Table Expressions (CTEs) simplify complex queries by breaking them into modular parts.

A project might involve:

- Ranking customers by purchase frequency within different regions.
- Calculating moving averages of sales over time.
- Identifying trends or anomalies using lead and lag comparisons.

- Building hierarchical queries to analyze organizational structures or product categories.

These skills are invaluable for more sophisticated data analysis and preparing datasets for predictive modeling.

4. Building a Data Warehouse Schema

Data science projects often require working with large datasets organized in a data warehouse. Designing and querying a star schema or snowflake schema can be a fantastic way to understand data modeling concepts.

A project could include:

- Creating dimension and fact tables for a sales or marketing dataset.
- Writing queries to perform slice-and-dice operations.
- Aggregating data at different granularity levels.
- Implementing slowly changing dimensions (SCD) logic.

This experience is crucial for data engineers and scientists alike because it improves your ability to work with business intelligence tools and large-scale analytics platforms.

5. Integrating SQL with Machine Learning Pipelines

While SQL isn't a machine learning language, it plays a critical role in preparing data for ML models. Advanced projects involve exporting processed data from SQL databases to platforms like Python or R for modeling.

You might:

- Write SQL queries to extract feature sets.
- Perform feature engineering directly in SQL using calculated columns.
- Use SQL to validate data quality before training models.
- Automate data refresh and extraction as part of an end-to-end pipeline.

This kind of project demonstrates your ability to bridge database management with predictive analytics, a highly sought-after skill in data science careers.

Practical Tips for Working on SQL Projects for Data Science

Undertaking SQL projects can sometimes feel overwhelming, especially if

you're new to databases or data science workflows. Here are some tips to help you get the most out of your projects.

- **Start with Realistic Datasets:** Use open datasets from sources like Kaggle, government portals, or public APIs. Real data introduces natural complexity and irregularities.
- **Focus on Query Optimization:** Learn how to write efficient SQL queries to improve runtime, especially when working with large tables. Understand indexing and query plans when possible.
- **Document Your Work:** Maintain clear notes or comments in your queries explaining your logic. This practice is invaluable for collaboration and future reference.
- **Combine SQL with Visualization Tools:** Export query results to tools like Tableau or Power BI to create dashboards. Visualizing data adds an important storytelling element.
- **Experiment with Different SQL Dialects:** Each database system has slight syntax differences and unique features. Familiarize yourself with at least one or two, such as PostgreSQL and MySQL.

Examples of SQL Projects for Data Science Beginners to Advanced

To inspire your learning journey, here are some example projects across varying difficulty levels:

Beginner Level

- Analyze a movie database to find highest-grossing films by year.
- Explore a public dataset on COVID-19 cases and deaths by country.
- Create customer segmentation reports based on purchase history.

Intermediate Level

- Build a sales dashboard using a retail dataset with multiple tables.
- Clean and standardize product review data by removing duplicates and handling missing values.
- Calculate customer lifetime value using window functions.

Advanced Level

- Design and query a data warehouse schema for an e-commerce platform.
- Implement cohort analysis to track user behavior over time.
- Prepare data in SQL for machine learning models predicting customer churn.

Each of these projects encourages you to apply different concepts and techniques, ultimately building a strong foundation in both SQL and data science principles.

The Role of SQL in the Data Science Ecosystem

While modern data science often highlights Python libraries like pandas or machine learning frameworks, SQL remains the backbone of data retrieval and preparation. Many data science tasks start with querying databases to extract relevant information. Integrating SQL skills with programming languages and visualization tools enhances your ability to develop comprehensive data solutions.

Moreover, cloud data platforms such as Amazon Redshift, Google BigQuery, and Snowflake have extended SQL capabilities, allowing data scientists to run complex analytical queries on petabyte-scale data. Understanding how to craft efficient SQL queries and optimize performance is indispensable for working in these environments.

By incorporating SQL projects for data science into your learning or professional development, you not only improve your technical skills but also gain a practical mindset for tackling data challenges in any industry.

Diving into SQL projects tailored for data science can transform how you interact with data. Whether you're exploring datasets, cleaning messy records, or preparing features for machine learning, SQL empowers you to unlock the stories hidden within your data efficiently and effectively. So, pick a project that excites you, start querying, and watch your data science capabilities flourish.

Frequently Asked Questions

What are some popular SQL project ideas for data science beginners?

Popular SQL project ideas for data science beginners include analyzing sales data, creating customer segmentation using purchase history, building a movie

recommendation system based on user ratings, exploring public datasets like COVID-19 stats, and manipulating financial datasets to find trends.

How can SQL be integrated into data science projects effectively?

SQL can be integrated into data science projects by using it for data extraction, cleaning, and transformation from relational databases before applying statistical or machine learning models. It helps in querying large datasets efficiently and preparing data pipelines for analysis.

What types of datasets are commonly used in SQL projects for data science?

Common datasets used in SQL projects for data science include ecommerce sales data, customer transaction records, social media data, healthcare patient records, financial market data, and public datasets like census or government statistics.

Which SQL skills are essential for data science projects?

Essential SQL skills for data science projects include writing complex queries with joins, subqueries, and aggregations; data cleaning and transformation using functions; creating and managing tables; understanding indexing and query optimization; and integrating SQL with programming languages like Python or R.

Can you recommend some resources to learn SQL through data science projects?

Recommended resources to learn SQL through data science projects include platforms like Kaggle for datasets and project ideas, online courses from Coursera and Udemy focused on SQL for data science, interactive tutorials like Mode Analytics SQL Tutorial, and books such as 'SQL for Data Analytics' by Upom Malik.

Additional Resources

****Exploring SQL Projects for Data Science: Practical Applications and Skills Development****

sql projects for data science have become a crucial stepping stone for professionals aiming to harness the power of data-driven decision-making. As organizations accumulate vast amounts of data, the ability to efficiently query, manipulate, and analyze databases using SQL (Structured Query Language) remains foundational for any data scientist. While Python and R

often dominate conversations around machine learning and predictive analytics, SQL's role in data extraction and preprocessing is indispensable. This article delves into various SQL projects tailored for data science, highlighting how these projects enhance analytical capabilities and prepare practitioners for real-world challenges.

The Significance of SQL in Data Science

Before diving into specific projects, it's essential to understand why SQL continues to be a vital skill within the data science toolkit. SQL is the lingua franca of relational databases, allowing users to retrieve and organize data efficiently. With data stored across multiple tables and schemas, SQL provides the means to perform complex joins, aggregations, and filtering operations that underpin advanced analyses.

Moreover, SQL's integration with data science platforms and its compatibility with big data ecosystems such as Apache Hive and Google BigQuery make it indispensable. Data scientists who master SQL not only streamline data wrangling but also gain the ability to interact with massive datasets that would be impractical to process solely in-memory.

In-Depth Analysis of SQL Projects for Data Science

SQL projects designed for data science purposes typically focus on practical applications such as exploratory data analysis (EDA), data cleaning, feature engineering, and reporting. These projects offer hands-on experience with real datasets, enabling learners to navigate common data challenges while honing their database querying skills.

1. Customer Segmentation Using Sales Data

A classic SQL project involves analyzing a retail or e-commerce sales database to segment customers based on purchasing behavior. This type of project incorporates several key SQL concepts:

- **Data aggregation:** Summarizing total purchases, frequency, and recency of transactions.
- **Window functions:** Ranking customers or calculating rolling averages over time periods.
- **Joins:** Combining customer profiles with transaction records to enrich

analysis.

This project not only teaches fundamental SQL techniques but also introduces data science concepts like customer lifetime value and RFM (Recency, Frequency, Monetary) modeling, which are pivotal in marketing analytics.

2. Analyzing Web Traffic Logs

Web server log data is another fertile ground for SQL projects tailored for data science. By querying logs stored in relational databases or cloud platforms, analysts can extract insights about user behavior, traffic patterns, and conversion funnels.

Key tasks in this project include:

- Parsing timestamps to understand peak activity periods.
- Filtering by user agents or geographic locations.
- Calculating session durations and bounce rates.

This project emphasizes the importance of string manipulation and date/time functions in SQL, reinforcing data cleaning skills vital for preparing datasets for further machine learning workflows.

3. Financial Data Analysis and Risk Assessment

Financial institutions frequently rely on SQL to analyze transactional data for risk management and fraud detection. Projects in this domain involve querying large-scale datasets to identify anomalies, calculate moving averages, and generate summary metrics.

For example, a project might focus on:

- Identifying outlier transactions using conditional filtering.
- Computing credit utilization ratios over time.
- Segmenting customers based on risk profiles derived from transaction histories.

Such projects expose learners to complex queries involving subqueries, nested selects, and CASE statements, enhancing their ability to write optimized and readable SQL code.

4. Healthcare Data Exploration

Healthcare datasets, often stored in relational databases, offer opportunities to analyze patient records, treatment outcomes, and operational efficiency. SQL projects in this sector typically require handling sensitive data with care and understanding structured schemas comprising multiple related tables.

Typical tasks include:

- Joining patient demographics with clinical visit records.
- Calculating average lengths of hospital stays by diagnosis.
- Tracking medication adherence or treatment success rates.

These projects integrate domain knowledge with SQL proficiency, emphasizing the importance of precise querying and data validation to support evidence-based healthcare decisions.

5. Social Media Sentiment and Engagement Analysis

Although sentiment analysis often requires natural language processing tools, SQL remains essential for aggregating and preparing social media data stored in databases. Projects might involve analyzing tweet metadata or Facebook engagement statistics.

Key SQL operations include:

- Extracting hashtags and mentions using string functions.
- Aggregating likes, shares, and comments by time or user segments.
- Filtering posts by keywords or sentiment labels.

Such projects demonstrate how SQL complements machine learning pipelines by providing clean, structured input for advanced analytics models.

Enhancing Data Science Skills Through SQL Projects

Engaging with SQL projects allows data scientists to bridge the gap between raw data and actionable insights. Unlike theoretical exercises, project-based learning fosters problem-solving abilities and encourages familiarity with real-world datasets that often contain inconsistencies or missing values.

Additionally, these projects cultivate a deeper understanding of database optimization techniques. Writing efficient queries is critical when dealing with large-scale data warehouses or cloud-based analytics platforms. Projects that incorporate indexing strategies, query execution plans, and performance tuning offer advanced skills that differentiate proficient data scientists.

Choosing the Right Tools and Platforms

Many online platforms provide environments conducive to SQL projects for data science. Examples include:

- **Google BigQuery:** Ideal for large datasets and cloud-based querying.
- **PostgreSQL:** An open-source relational database suitable for local experimentation.
- **SQLite:** Lightweight and easy to set up for smaller projects.
- **Kaggle:** Offers datasets and SQL notebooks for interactive exploration.

Selecting a platform depends on project scale, data complexity, and personal learning goals. Cloud platforms often feature integration with other data science tools, enhancing workflow efficiency.

Integrating SQL with Other Data Science Tools

SQL seldom operates in isolation within data science projects. Combining SQL with Python libraries such as pandas, or R's dplyr package, allows for seamless transitions from data extraction to analysis and visualization. Many data scientists use SQL to retrieve and preprocess data, then apply machine learning algorithms in Python or R.

Furthermore, business intelligence tools like Tableau and Power BI often rely on SQL queries to feed dashboards, making SQL project experience valuable for creating dynamic visual reports.

Final Thoughts on SQL Projects for Data Science

The landscape of data science demands a multifaceted skill set, with SQL projects serving as a foundational component. By engaging in diverse SQL projects—from customer segmentation to healthcare data analysis—practitioners develop essential competencies in data querying, manipulation, and optimization. These projects not only enhance technical proficiency but also cultivate analytical thinking crucial for interpreting complex datasets.

Continued practice with real-world SQL projects ensures that data scientists remain versatile and prepared to tackle the evolving challenges of big data analytics. As organizations increasingly emphasize data-driven strategies, proficiency in SQL emerges as a timeless asset that unlocks the potential within vast repositories of information.

[Sql Projects For Data Science](#)

sql projects for data science: *Data Science* Prabhu TL, 2025-04-12 Data Science: From Basics to Advanced Unlock the Power of Data to Build Intelligent Solutions and Transform Your Career Are you ready to master one of the most in-demand and future-proof skills of the 21st century? Whether you're a beginner, student, working professional, or tech enthusiast—this comprehensive guide is your ultimate roadmap to becoming a data science expert. “Data Science: From Basics to Advanced” takes you on a complete journey through the world of data, starting from foundational concepts and evolving all the way to advanced machine learning, deep learning, and real-world deployment. □ What You’ll Learn Inside: □ Statistics, Probability & Linear Algebra — The math behind the magic □ Python Programming — Clean and efficient data handling with NumPy and pandas □ Exploratory Data Analysis — Visualize, understand, and tell stories with data □ Machine Learning & Deep Learning — Build, train, and tune powerful models □ Natural Language Processing, Time Series, and Computer Vision □ Cloud Tools, Big Data, and MLOps — Deploy scalable solutions using AWS, GCP, and more □ Bias, Fairness & Data Ethics — Build responsible, human-centered AI □ Career Tools — Portfolio templates, interview prep, certifications, and roadmaps □ Who This Book Is For: Beginners looking for a step-by-step introduction to data science Professionals seeking to upskill or transition into AI/ML roles Students preparing for internships and job interviews Entrepreneurs and business leaders leveraging data-driven strategies □ Includes: □ Real-world projects and use cases □ Sample code and reusable templates □ Cheat sheets, glossary, and portfolio guidance □ Companion resources and learning roadmap If you've ever wanted to extract insight from raw data, build machine learning models, or launch a data science career, this is the book you've been waiting for. □ Your journey into data starts now. □ Get your copy of Data Science: From Basics to Advanced and turn information into impact.

sql projects for data science: FOUR PROJECTS: MySQL and SQLite For Data Science with Python GUI Vivian Siahaan, Rismon Hasiholan Sianipar, 2022-06-29 PROJECT 1: SQLITE AND DATA SCIENCE: QUERIES AND VISUALIZATION WITH PYTHON GUI In this project, you will develop GUI with PyQt5 to: utilize Push Button, Combo Box, Table Widget, Line Edit, and Widget, read and create SQLite database and every table in it, 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 SQLite from <https://dev.mysql.com/doc/sakila/en/>. PROJECT 2: 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/>. 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 company. The Northwind sample database includes 11 tables and the table relationships are showcased in the following entity relationship diagram. 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 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: 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 company. The Northwind sample database includes 11 tables and the table relationships are showcased in the following entity relationship diagram. 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 SQLite 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 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.

sql projects for data science: Hands-On Data Science with SQL Server 2017 Marek Chmel, Vladimír Mužný, 2018-11-29 Find, explore, and extract big data to transform into actionable insights Key Features Perform end-to-end data analysis—from exploration to visualization Real-world examples, tasks, and interview queries to be a proficient data scientist Understand how SQL is used for big data processing using HiveQL and SparkSQL Book Description SQL Server is a relational database management system that enables you to cover end-to-end data science processes using various inbuilt services and features. Hands-On Data Science with SQL Server 2017 starts with an overview of data science with SQL to understand the core tasks in data science. You will learn intermediate-to-advanced level concepts to perform analytical tasks on data using SQL Server. The book has a unique approach, covering best practices, tasks, and challenges to test your abilities at the end of each chapter. You will explore the ins and outs of performing various key tasks such as data collection, cleaning, manipulation, aggregations, and filtering techniques. As you make your way through the chapters, you will turn raw data into actionable insights by wrangling and extracting data from databases using T-SQL. You will get to grips with preparing and presenting data in a meaningful way, using Power BI to reveal hidden patterns. In the concluding chapters, you will work with SQL Server integration services to transform data into a useful format and delve into advanced examples covering machine learning concepts such as predictive analytics using real-world examples. By the end of this book, you will be in a position to handle the growing amounts of data and perform everyday activities that a data science professional performs. What you will learn Understand what data science is and how SQL Server is used for big data processing Analyze incoming data with SQL queries and visualizations Create, train, and evaluate predictive models Make predictions using trained models and establish regular retraining courses Incorporate data source querying into SQL Server Enhance built-in T-SQL capabilities using SQL CLR Visualize data with Reporting Services, Power View, and Power BI Transform data with R, Python, and Azure Who this book is for Hands-On Data Science with SQL Server 2017 is intended for data scientists, data analysts, and big data professionals who want to master their skills learning SQL and its applications. This book will be helpful even for beginners who want to build their career as data science professionals using the power of SQL Server 2017. Basic familiarity with SQL language will aid with understanding the concepts covered in this book.

sql projects for data science: Hands-on ML Projects with OpenCV Mugesh S., 2023-08-10 Be at your A game in building Intelligent systems by leveraging Computer vision and Machine Learning. KEY FEATURES ● Step-by-step instructions and code snippets for real world ML projects. ● Covers entire spectrum from basics to advanced concepts such as deep learning, transfer learning, and

model optimization ● Loaded with practical tips and best practices for implementing machine learning with OpenCV for optimising your workflow. DESCRIPTION This book is an in-depth guide that merges machine learning techniques with OpenCV, the most popular computer vision library, using Python. The book introduces fundamental concepts in machine learning and computer vision, progressing to practical implementation with OpenCV. Concepts related to image preprocessing, contour and thresholding techniques, motion detection and tracking are explained in a step-by-step manner using code and output snippets. Hands-on projects with real-world datasets will offer you an invaluable experience in solving OpenCV challenges with machine learning. It's an ultimate guide to explore areas like deep learning, transfer learning, and model optimization, empowering readers to tackle complex tasks. Every chapter offers practical tips and tricks to build effective ML models. By the end, you would have mastered and applied ML concepts confidently to real-world computer vision problems and will be able to develop robust and accurate machine-learning models for diverse applications. Whether you are new to machine learning or seeking to enhance your computer vision skills, This book is an invaluable resource for mastering the integration of machine learning and computer vision using OpenCV and Python. WHAT WILL YOU LEARN ● Learn how to work with images and perform basic image processing tasks using OpenCV. ● Implement machine learning techniques to computer vision tasks such as image classification, object detection, and image segmentation. ● Work on real-world projects and datasets to gain hands-on experience in applying machine learning techniques with OpenCV. ● Explore the concepts of deep learning using Tensorflow and Keras and how it can be used for computer vision tasks. ● Understand the concept of transfer learning and how pre-trained models can be leveraged for new tasks. ● Utilize techniques for model optimization and deployment in resource-constrained environments. ● Implement end-to-end solutions and address challenges encountered in practical scenarios. WHO IS THIS BOOK FOR? This book is for everyone with a basic understanding of programming and who wants to apply machine learning in computer vision using OpenCV and Python. Whether you're a student, researcher, or developer, this book will equip you with practical skills for machine learning projects. Some familiarity with Python and machine learning concepts is assumed. Beginners too will find this book valuable as it offers clear examples and explanations for every concept. TABLE OF CONTENTS Chapter 1: Getting Started With OpenCV Chapter 2: Basic Image & Video Analytics in OpenCV Chapter 3: Image Processing 1 using OpenCV Chapter 4: Image Processing 2 using OpenCV Chapter 5: Thresholding and Contour Techniques Using OpenCV Chapter 6: Detect Corners and Road Lane using OpenCV Chapter 7: Object And Motion Detection Using Opencv Chapter 8: Image Segmentation and Detecting Faces Using OpenCV Chapter 9: Introduction to Deep Learning with OpenCV Chapter 10: Advance Deep Learning Projects with OpenCV Chapter 11: Deployment of OpenCV projects

sql projects for data science: 5 FIVE DATA SCIENCE PROJECTS FOR ANALYSIS, CLASSIFICATION, PREDICTION, AND SENTIMENT ANALYSIS WITH PYTHON GUI Vivian Siahaan, Rismon Hasiholan Sianipar, 2022-04-29 PROJECT 1: SUPERMARKET SALES ANALYSIS AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI The dataset used in this project consists of the growth of supermarkets with high market competitions in most populated cities. The dataset is one of the historical sales of supermarket company which has recorded in 3 different branches for 3 months data. Predictive data analytics methods are easy to apply with this dataset. Attribute information in the dataset are as follows: Invoice id: Computer generated sales slip invoice identification number; Branch: Branch of supercenter (3 branches are available identified by A, B and C); City: Location of supercenters; Customer type: Type of customers, recorded by Members for customers using member card and Normal for without member card; Gender: Gender type of customer; Product line: General item categorization groups - Electronic accessories, Fashion accessories, Food and beverages, Health and beauty, Home and lifestyle, Sports and travel; Unit price: Price of each product in \$; Quantity: Number of products purchased by customer; Tax: 5% tax fee for customer buying; Total: Total price including tax; Date: Date of purchase (Record available from January 2019 to March 2019); Time: Purchase time (10am to 9pm); Payment: Payment used by

customer for purchase (3 methods are available – Cash, Credit card and Ewallet); COGS: Cost of goods sold; Gross margin percentage: Gross margin percentage; Gross income: Gross income; and Rating: Customer stratification rating on their overall shopping experience (On a scale of 1 to 10). In this project, you will perform predicting rating using machine learning. 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: DETECTING CYBERBULLYING TWEETS USING MACHINE LEARNING AND DEEP LEARNING WITH PYTHON GUI As social media usage becomes increasingly prevalent in every age group, a vast majority of citizens rely on this essential medium for day-to-day communication. Social media's ubiquity means that cyberbullying can effectively impact anyone at any time or anywhere, and the relative anonymity of the internet makes such personal attacks more difficult to stop than traditional bullying. On April 15th, 2020, UNICEF issued a warning in response to the increased risk of cyberbullying during the COVID-19 pandemic due to widespread school closures, increased screen time, and decreased face-to-face social interaction. The statistics of cyberbullying are outright alarming: 36.5% of middle and high school students have felt cyberbullied and 87% have observed cyberbullying, with effects ranging from decreased academic performance to depression to suicidal thoughts. In light of all of this, this dataset contains more than 47000 tweets labelled according to the class of cyberbullying: Age; Ethnicity; Gender; Religion; Other type of cyberbullying; and Not cyberbullying. The data has been balanced in order to contain ~8000 of each class. 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.

PROJECT 3: HIGHER EDUCATION STUDENT ACADEMIC PERFORMANCE ANALYSIS AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI The dataset used in this project was collected from the Faculty of Engineering and Faculty of Educational Sciences students in 2019. The purpose is to predict students' end-of-term performances using ML techniques. Attribute information in the dataset are as follows: Student ID; Student Age (1: 18-21, 2: 22-25, 3: above 26); Sex (1: female, 2: male); Graduated high-school type: (1: private, 2: state, 3: other); Scholarship type: (1: None, 2: 25%, 3: 50%, 4: 75%, 5: Full); Additional work: (1: Yes, 2: No); Regular artistic or sports activity: (1: Yes, 2: No); Do you have a partner: (1: Yes, 2: No); Total salary if available (1: USD 135-200, 2: USD 201-270, 3: USD 271-340, 4: USD 341-410, 5: above 410); Transportation to the university: (1: Bus, 2: Private car/taxi, 3: bicycle, 4: Other); Accommodation type in Cyprus: (1: rental, 2: dormitory, 3: with family, 4: Other); Mother's education: (1: primary school, 2: secondary school, 3: high school, 4: university, 5: MSc., 6: Ph.D.); Father's education: (1: primary school, 2: secondary school, 3: high school, 4: university, 5: MSc., 6: Ph.D.); Number of sisters/brothers (if available): (1: 1, 2: 2, 3: 3, 4: 4, 5: 5 or above); Parental status: (1: married, 2: divorced, 3: died - one of them or both); Mother's occupation: (1: retired, 2: housewife, 3: government officer, 4: private sector employee, 5: self-employment, 6: other); Father's occupation: (1: retired, 2: government officer, 3: private sector employee, 4: self-employment, 5: other); Weekly study hours: (1: None, 2: <5 hours, 3: 6-10 hours, 4: 11-20 hours, 5: more than 20 hours); Reading frequency (non-scientific books/journals): (1: None, 2: Sometimes, 3: Often); Reading frequency (scientific books/journals): (1: None, 2: Sometimes, 3: Often); Attendance to the seminars/conferences related to the department: (1: Yes, 2: No); Impact of your projects/activities on your success: (1: positive, 2: negative, 3: neutral); Attendance to classes (1: always, 2: sometimes, 3: never); Preparation to midterm exams 1: (1: alone, 2: with friends, 3: not applicable); Preparation to midterm exams 2: (1: closest date to the

exam, 2: regularly during the semester, 3: never); Taking notes in classes: (1: never, 2: sometimes, 3: always); Listening in classes: (1: never, 2: sometimes, 3: always); Discussion improves my interest and success in the course: (1: never, 2: sometimes, 3: always); Flip-classroom: (1: not useful, 2: useful, 3: not applicable); Cumulative grade point average in the last semester (/4.00): (1: <2.00, 2: 2.00-2.49, 3: 2.50-2.99, 4: 3.00-3.49, 5: above 3.49); Expected Cumulative grade point average in the graduation (/4.00): (1: <2.00, 2: 2.00-2.49, 3: 2.50-2.99, 4: 3.00-3.49, 5: above 3.49); Course ID; and OUTPUT: Grade (0: Fail, 1: DD, 2: DC, 3: CC, 4: CB, 5: BB, 6: BA, 7: AA). 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.

PROJECT 4: COMPANY BANKRUPTCY ANALYSIS AND PREDICTION USING MACHINE LEARNING WITH PYTHON GUI

The dataset was collected from the Taiwan Economic Journal for the years 1999 to 2009. Company bankruptcy was defined based on the business regulations of the Taiwan Stock Exchange. Attribute information in the dataset are as follows: Y - Bankrupt?: Class label; X1 - ROA(C) before interest and depreciation before interest: Return On Total Assets(C); X2 - ROA(A) before interest and % after tax: Return On Total Assets(A); X3 - ROA(B) before interest and depreciation after tax: Return On Total Assets(B); X4 - Operating Gross Margin: Gross Profit/Net Sales; X5 - Realized Sales Gross Margin: Realized Gross Profit/Net Sales; X6 - Operating Profit Rate: Operating Income/Net Sales; X7 - Pre-tax net Interest Rate: Pre-Tax Income/Net Sales; X8 - After-tax net Interest Rate: Net Income/Net Sales; X9 - Non-industry income and expenditure/revenue: Net Non-operating Income Ratio; X10 - Continuous interest rate (after tax): Net Income-Exclude Disposal Gain or Loss/Net Sales; X11 - Operating Expense Rate: Operating Expenses/Net Sales; X12 - Research and development expense rate: (Research and Development Expenses)/Net Sales; X13 - Cash flow rate: Cash Flow from Operating/Current Liabilities; X14 - Interest-bearing debt interest rate: Interest-bearing Debt/Equity; X15 - Tax rate (A): Effective Tax Rate; X16 - Net Value Per Share (B): Book Value Per Share(B); X17 - Net Value Per Share (A): Book Value Per Share(A); X18 - Net Value Per Share (C): Book Value Per Share(C); X19 - Persistent EPS in the Last Four Seasons: EPS-Net Income; X20 - Cash Flow Per Share; X21 - Revenue Per Share (Yuan ¥): Sales Per Share; X22 - Operating Profit Per Share (Yuan ¥): Operating Income Per Share; X23 - Per Share Net profit before tax (Yuan ¥): Pretax Income Per Share; X24 - Realized Sales Gross Profit Growth Rate; X25 - Operating Profit Growth Rate: Operating Income Growth; X26 - After-tax Net Profit Growth Rate: Net Income Growth; X27 - Regular Net Profit Growth Rate: Continuing Operating Income after Tax Growth; X28 - Continuous Net Profit Growth Rate: Net Income-Excluding Disposal Gain or Loss Growth; X29 - Total Asset Growth Rate: Total Asset Growth; X30 - Net Value Growth Rate: Total Equity Growth; X31 - Total Asset Return Growth Rate Ratio: Return on Total Asset Growth; X32 - Cash Reinvestment %: Cash Reinvestment Ratio; X33 - Current Ratio; X34 - Quick Ratio: Acid Test; X35 - Interest Expense Ratio: Interest Expenses/Total Revenue; X36 - Total debt/Total net worth: Total Liability/Equity Ratio; X37 - Debt ratio %: Liability/Total Assets; X38 - Net worth/Assets: Equity/Total Assets; X39 - Long-term fund suitability ratio (A): (Long-term Liability+Equity)/Fixed Assets; X40 - Borrowing dependency: Cost of Interest-bearing Debt; X41 - Contingent liabilities/Net worth: Contingent Liability/Equity; X42 - Operating profit/Paid-in capital: Operating Income/Capital; X43 - Net profit before tax/Paid-in capital: Pretax Income/Capital; X44 - Inventory and accounts receivable/Net value: (Inventory+Accounts Receivables)/Equity; X45 - Total Asset Turnover; X46 - Accounts Receivable Turnover; X47 - Average Collection Days: Days Receivable Outstanding; X48 - Inventory Turnover Rate (times); X49 - Fixed Assets Turnover Frequency; X50 - Net Worth Turnover Rate (times): Equity Turnover; X51 - Revenue per person: Sales Per Employee; X52 - Operating profit per person: Operation Income Per Employee; X53 - Allocation rate per person: Fixed Assets Per Employee; X54 - Working Capital to Total Assets; X55 - Quick Assets/Total Assets; X56 - Current Assets/Total Assets;

X57 - Cash/Total Assets; X58 - Quick Assets/Current Liability; X59 - Cash/Current Liability; X60 - Current Liability to Assets; X61 - Operating Funds to Liability; X62 - Inventory/Working Capital; X63 - Inventory/Current Liability; X64 - Current Liabilities/Liability; X65 - Working Capital/Equity; X66 - Current Liabilities/Equity; X67 - Long-term Liability to Current Assets; X68 - Retained Earnings to Total Assets; X69 - Total income/Total expense; X70 - Total expense/Assets; X71 - Current Asset Turnover Rate: Current Assets to Sales; X72 - Quick Asset Turnover Rate: Quick Assets to Sales; X73 - Working capital Turnover Rate: Working Capital to Sales; X74 - Cash Turnover Rate: Cash to Sales; X75 - Cash Flow to Sales; X76 - Fixed Assets to Assets; X77 - Current Liability to Liability; X78 - Current Liability to Equity; X79 - Equity to Long-term Liability; X80 - Cash Flow to Total Assets; X81 - Cash Flow to Liability; X82 - CFO to Assets; X83 - Cash Flow to Equity; X84 - Current Liability to Current Assets; X85 - Liability-Assets Flag: 1 if Total Liability exceeds Total Assets, 0 otherwise; X86 - Net Income to Total Assets; X87 - Total assets to GNP price; X88 - No-credit Interval; X89 - Gross Profit to Sales; X90 - Net Income to Stockholder's Equity; X91 - Liability to Equity; X92 - Degree of Financial Leverage (DFL); X93 - Interest Coverage Ratio (Interest expense to EBIT); X94 - Net Income Flag: 1 if Net Income is Negative for the last two years, 0 otherwise; and X95 - Equity to Liabilities. 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.

PROJECT 5: DATA SCIENCE FOR RAIN CLASSIFICATION AND PREDICTION WITH PYTHON GUI This dataset contains about 10 years of daily weather observations from many locations across Australia. RainTomorrow is the target variable to predict. You will determine rain or not in the next day. This column is Yes if the rain for that day was 1mm or more. Observations were drawn from numerous weather stations. The daily observations are available from <http://www.bom.gov.au/climate/data>. The dataset contains 23 attributes. Some of them are as follows: About some of them are: DATE - The date of observation; LOCATION - The common name of the location of the weather station; MINTEMP - The minimum temperature in degrees celsius; MAXTEMP - The maximum temperature in degrees celsius; RAINFALL - The amount of rainfall recorded for the day in mm; EVAPORATION - The so-called Class A pan evaporation (mm) in the 24 hours to 9am; SUNSHINE - The number of hours of bright sunshine in the day; WINDGUESTDIR - The direction of the strongest wind gust in the 24 hours to midnight; WINDGUESTSPEED - The speed (km/h) of the strongest wind gust in the 24 hours to midnight; and WINDDIR9AM - Direction of the wind at 9am. 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.

sql projects for data science: Hands-on ML Projects with OpenCV: Master Computer Vision and Machine Learning using OpenCV and Python Mugesh S., 2023-08-09 Be at your A game in building Intelligent systems by leveraging Computer vision and Machine Learning. Key Features ● Step-by-step instructions and code snippets for real world ML projects. ● Covers entire spectrum from basics to advanced concepts such as deep learning, transfer learning, and model optimization ● Loaded with practical tips and best practices for implementing machine learning with OpenCV for optimising your workflow. Book Description This book is an in-depth guide that merges machine learning techniques with OpenCV, the most popular computer vision library, using Python. The book introduces fundamental concepts in machine learning and computer vision, progressing to practical implementation with OpenCV. Concepts related to image preprocessing, contour and thresholding techniques, motion detection and tracking are explained in a step-by-step manner using

code and output snippets. Hands-on projects with real-world datasets will offer you an invaluable experience in solving OpenCV challenges with machine learning. It's an ultimate guide to explore areas like deep learning, transfer learning, and model optimization, empowering readers to tackle complex tasks. Every chapter offers practical tips and tricks to build effective ML models. By the end, you would have mastered and applied ML concepts confidently to real-world computer vision problems and will be able to develop robust and accurate machine-learning models for diverse applications. Whether you are new to machine learning or seeking to enhance your computer vision skills, This book is an invaluable resource for mastering the integration of machine learning and computer vision using OpenCV and Python. What you will learn ● Learn how to work with images and perform basic image processing tasks using OpenCV. ● Implement machine learning techniques to computer vision tasks such as image classification, object detection, and image segmentation. ● Work on real-world projects and datasets to gain hands-on experience in applying machine learning techniques with OpenCV. ● Explore the concepts of deep learning using Tensorflow and Keras and how it can be used for computer vision tasks. Who is this book for? This book is for everyone with a basic understanding of programming and who wants to apply machine learning in computer vision using OpenCV and Python. Whether you're a student, researcher, or developer, this book will equip you with practical skills for machine learning projects. Some familiarity with Python and machine learning concepts is assumed. Table of ContentsChapter 1: Getting Started With OpenCV Chapter 2: Basic Image & Video Analytics in OpenCV Chapter 3: Image Processing 1 using OpenCV Chapter 4: Image Processing 2 using OpenCV Chapter 5: Thresholding and Contour Techniques Using OpenCV Chapter 6: Detect Corners and Road Lane using OpenCV Chapter 7: Object And Motion Detection Using Opencv Chapter 8: Image Segmentation and Detecting Faces Using OpenCV Chapter 9: Introduction to Deep Learning with OpenCV Chapter 10: Advance Deep Learning Projects with OpenCV Chapter 11: Deployment of OpenCV projects

sql projects for data science: Fundamentals of Data Science Mr.Desidi Narsimha Reddy, Lova Naga Babu Ramiseti, Mr.Harikrishna Pathipati, 2024-09-05 Mr.Desidi Narsimha Reddy, Data Consultant (Data Governance, Data Analytics: Enterprise Performance Management, AI & ML), Soniks consulting LLC, 101 E Park Blvd Suite 600, Plano, TX 75074, United States. Lova Naga Babu Ramiseti, EPM Consultant, Department of Information Technology, MiniSoft Empowering Techonolgy, 10333 Harwin Dr. #375e, Houston, TX 77036, USA. Mr.Harikrishna Pathipati, EPM Manager, Department of Information Technology, ITG Technologies, 10998 S Wilcrest Dr, Houston, TX 77099, USA.

sql projects for data science: The Data Scientist and his Demons Heverton Anunciação, 2025-08-15 Yes, it's true that the devil can be in the details What are the best characteristics of an excellent data scientist or statistician? You are mistaken if you thought about mathematical knowledge or mastery of data tools! Those receiving salaries of up to thousands of reais per day of work have something in common: they are humble and know that they are never sure, but they persistently know how to “create” bridges between information repositories or even departments of people. This same data scientist will have to break boundaries between departmental areas that do not speak to each other to reach a common and ideal result for the short, medium or long term. Each of these professionals who share their knowledge in this book presents their own experience of how to involve data, people, and techniques. At times, this same data scientist acts as a “data therapist”, understanding your past and traumas, going back in time to understand your evolution to transform this same data into “digital wisdom” and get the best out of it. A company that does not apply data science with CRM, Customer Experience, Commercial Intelligence and other concepts to constantly reformulate itself, as a brand and product, may have its days numbered. Show your data to an extremely qualified data scientist, and he or she will tell you what future your company will have. Would your company have the courage to have a professional with this skill? The market is looking for you: data scientist.

sql projects for data science: Data Science with SQL Server Quick Start Guide Dejan Sarka, 2018-08-31 Get unique insights from your data by combining the power of SQL Server, R and Python

Key Features Use the features of SQL Server 2017 to implement the data science project life cycle Leverage the power of R and Python to design and develop efficient data models find unique insights from your data with powerful techniques for data preprocessing and analysis Book Description SQL Server only started to fully support data science with its two most recent editions. If you are a professional from both worlds, SQL Server and data science, and interested in using SQL Server and Machine Learning (ML) Services for your projects, then this is the ideal book for you. This book is the ideal introduction to data science with Microsoft SQL Server and In-Database ML Services. It covers all stages of a data science project, from business and data understanding, through data overview, data preparation, modeling and using algorithms, model evaluation, and deployment. You will learn to use the engines and languages that come with SQL Server, including ML Services with R and Python languages and Transact-SQL. You will also learn how to choose which algorithm to use for which task, and learn the working of each algorithm. What you will learn Use the popular programming languages, T-SQL, R, and Python, for data science Understand your data with queries and introductory statistics Create and enhance the datasets for ML Visualize and analyze data using basic and advanced graphs Explore ML using unsupervised and supervised models Deploy models in SQL Server and perform predictions Who this book is for SQL Server professionals who want to start with data science, and data scientists who would like to start using SQL Server in their projects will find this book to be useful. Prior exposure to SQL Server will be helpful.

sql projects for data science: 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 & invoice_items tables: these two tables store invoice data. The invoice table stores invoice header data and the invoice_items table stores the invoice line items data; 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 & playlist_track tables: The playlist table store data about playlists. Each playlist contains a list of tracks. Each track may belong to multiple playlists. The relationship between the playlist table and track table is many-to-many. The playlist_track table is used to reflect this relationship. 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 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 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 company. The Northwind sample database includes 11 tables and the table relationships are showcased in the following entity relationship diagram. 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 SQLite 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 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.di.fc.ul.pt/oracle11g/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.

sql projects for data science: *Data Science Projects with Python* Stephen Klosterman, 2021-07-29 Gain hands-on experience of Python programming with industry-standard machine learning techniques using pandas, scikit-learn, and XGBoost Key FeaturesThink critically about data and use it to form and test a hypothesisChoose an appropriate machine learning model and train it on your dataCommunicate data-driven insights with confidence and clarityBook Description If data is the new oil, then machine learning is the drill. As companies gain access to ever-increasing quantities of raw data, the ability to deliver state-of-the-art predictive models that support business decision-making becomes more and more valuable. In this book, you'll work on an end-to-end project based around a realistic data set and split up into bite-sized practical exercises. This creates a case-study approach that simulates the working conditions you'll experience in real-world data science projects. You'll learn how to use key Python packages, including pandas, Matplotlib, and scikit-learn, and master the process of data exploration and data processing, before moving on to fitting, evaluating, and tuning algorithms such as regularized logistic regression and random forest. Now in its second edition, this book will take you through the end-to-end process of exploring data and delivering machine learning models. Updated for 2021, this edition includes brand new content

on XGBoost, SHAP values, algorithmic fairness, and the ethical concerns of deploying a model in the real world. By the end of this data science book, you'll have the skills, understanding, and confidence to build your own machine learning models and gain insights from real data. What you will learnLoad, explore, and process data using the pandas Python packageUse Matplotlib to create compelling data visualizationsImplement predictive machine learning models with scikit-learnUse lasso and ridge regression to reduce model overfittingEvaluate random forest and logistic regression model performanceDeliver business insights by presenting clear, convincing conclusionsWho this book is for Data Science Projects with Python – Second Edition is for anyone who wants to get started with data science and machine learning. If you're keen to advance your career by using data analysis and predictive modeling to generate business insights, then this book is the perfect place to begin. To quickly grasp the concepts covered, it is recommended that you have basic experience of programming with Python or another similar language, and a general interest in statistics.

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Nolis, 2020-03-24 Summary You are going to need more than technical knowledge to succeed as a data scientist. Build a Career in Data Science teaches you what school leaves out, from how to land your first job to the lifecycle of a data science project, and even how to become a manager. Purchase of the print book includes a free eBook in PDF, Kindle, and ePub formats from Manning Publications. About the technology What are the keys to a data scientist's long-term success? Blending your technical know-how with the right "soft skills" turns out to be a central ingredient of a rewarding career. About the book Build a Career in Data Science is your guide to landing your first data science job and developing into a valued senior employee. By following clear and simple instructions, you'll learn to craft an amazing resume and ace your interviews. In this demanding, rapidly changing field, it can be challenging to keep projects on track, adapt to company needs, and manage tricky stakeholders. You'll love the insights on how to handle expectations, deal with failures, and plan your career path in the stories from seasoned data scientists included in the book. What's inside Creating a portfolio of data science projects Assessing and negotiating an offer Leaving gracefully and moving up the ladder Interviews with professional data scientists About the reader For readers who want to begin or advance a data science career. About the author Emily Robinson is a data scientist at Warby Parker. Jacqueline Nolis is a data science consultant and mentor. Table of Contents: PART 1 - GETTING STARTED WITH DATA SCIENCE 1. What is data science? 2. Data science companies 3. Getting the skills 4. Building a portfolio PART 2 - FINDING YOUR DATA SCIENCE JOB 5. The search: Identifying the right job for you 6. The application: Résumés and cover letters 7. The interview: What to expect and how to handle it 8. The offer: Knowing what to accept PART 3 - SETTLING INTO DATA SCIENCE 9. The first months on the job 10. Making an effective analysis 11. Deploying a model into production 12. Working with stakeholders PART 4 - GROWING IN YOUR DATA SCIENCE ROLE 13. When your data science project fails 14. Joining the data science community 15. Leaving your job gracefully 16. Moving up the ladder

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