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AI/ML Interns Weekly Plan

Python Learning Map - 8 Weeks

Week 05 - Database Implementation and File Handling

Day 1

User Story - 0016 - Introduction to Databases and SQL Basics

- **Topics Covered**
 - Overview of databases relational vs. NoSQL.
 - Introduction to SQL basic commands (SELECT, INSERT, UPDATE, DELETE).
 - Understanding database design concepts (tables, relationships).
 - **Exercises**
 - Set up a local database using MySQL or MSSQL.
 - Create a simple database and a table (e.g., `Users` with columns `id`, `name`, `email`).
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Day 2

User Story - 0017 - Connecting to MSSQL with Python

- **Topics Covered**
 - Installing required libraries (e.g., `pyodbc` for MSSQL).
 - Establishing a connection to MSSQL from Python.
 - Executing basic SQL queries using Python.
 - **Exercises**
 - Write a Python script to connect to MSSQL, insert data into the `Users` table, and retrieve the data.
 - Use parameterized queries to prevent SQL injection.
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Day 2

User Story - 0018 - Connecting to MySQL with Python

- **Topics Covered**

- Installing the MySQL connector library (e.g., `mysql-connector-python`).
- Connecting to a MySQL database and executing queries.
- Handling transactions and managing connections.

- **Exercises**

- Write a Python script to connect to MySQL, create a `Products` table, and perform CRUD operations (Create, Read, Update, Delete).
 - Implement error handling for database operations.
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Day 3

User Story - 0019 - Introduction to MongoDB

- **Topics Covered**

- Overview of NoSQL databases and MongoDB.
- Installing MongoDB and setting up the environment.
- Understanding collections, documents, and BSON data format.

- **Exercises**

- Install `pymongo` and connect to a local MongoDB instance.
 - Create a collection (e.g., `employees`) and insert multiple documents.
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Day 3

User Story - 0020 - CRUD Operations with MongoDB

- **Topics Covered**

- Performing CRUD operations in MongoDB using Python.
- Querying data and filtering results.
- Updating and deleting documents.

- **Exercises**

- Write a Python script to insert, retrieve, update, and delete documents in the `employees` collection.
 - Implement queries to filter documents based on certain criteria (e.g., finding employees by department).
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Day 4

User Story - 0021 - File Handling in Python

- **Topics Covered**
 - Basics of file handling in Python opening, reading, writing, and closing files.
 - Working with different file formats (text, CSV, JSON).
 - **Exercises**
 - Write a Python script to read data from a text file and display it.
 - Create a CSV file from a list of dictionaries and read it back.
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Day 5

User Story - 0022 - Integrating Databases and File Handling

- **Project Description** Develop a simple application that combines database operations with file handling.
 - **Project Ideas**
 - **User Management System**
 - Create a Python script that allows users to register, updates user information, and stores user data in either a SQL or NoSQL database.
 - Additionally, export the user data to a CSV file and read from it to display user information.
 - **Inventory Management**
 - Build a script to manage products in an inventory.
 - Store product details in a database and export the inventory to a JSON file.
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Learning Outcomes

By the end of this week, interns should be able to

- Connect to and perform CRUD operations on both SQL (MSSQL, MySQL) and NoSQL (MongoDB) databases using Python.
- Understand and apply basic file handling techniques in Python to read from and write to different file formats.
- Integrate database operations with file handling in a cohesive application.

This week will equip interns with valuable skills necessary for working with data and databases in real-world applications!

Thank You



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