

PYTHON and DATABASE Project Presentation



Purpose and Goal

Purpose:

Creating a console application to search for movies in the **Sakila** database

Programming language:

Python

Goal:

Implement movie search scenarios:

- 10+ movies are found by keyword;
- 10+ movies are found by category and year;
- by command displays a list of the most popular queries that were searched

Database interaction language:

MySQL



The project technology

is a combination of:

1. Object-Oriented Programming

- database interaction:
 - establishing a connection;
 - executing queries;
 - creating and managing table with popular queries;
- graphical user interface;

2. Functional Programming

- program entry point;
- setting up menu branches;
- building SQL queries;
- error handling and logging;

Used Python modules:

import os

Here is used for load environment variables e.g.: method **os.getenv()** is loading DataBase connection SETTINGS such as **"host", "user", "password", "database_name"**

import typing

Support for gradual typing as defined by PEP 484 and subsequent PEPs. Here is used for types annotation

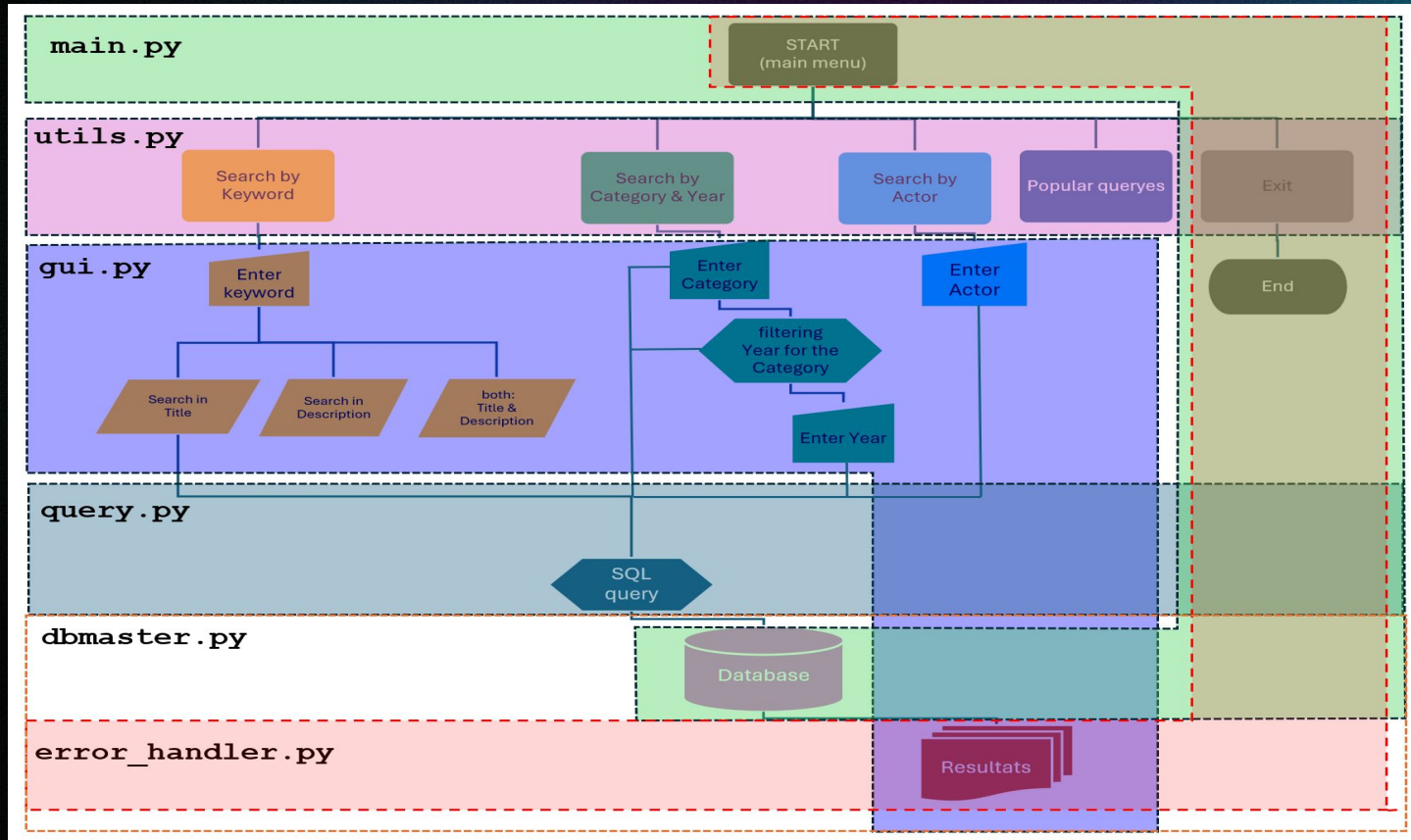
import mysql.connector

MySQL driver that allows to work with MySQL databases. Methods are used in PROJECT:
connect(): establishes a connection to the database;
cursor(): creates a cursor for executing queries;
execute(): executes a single SQL query;
fetchall(): gets all rows from the query result;
commit(): commits all changes to the database;
rollback(): rollback changes made in the current transaction;
close(): closes the connection to the database.

import tkinter

tkinter is a standard Python module for creating graphical user interfaces (GUI). It provides tools for developing applications with windows, buttons, checkboxes, text fields, and other interface elements

Project: functional logic



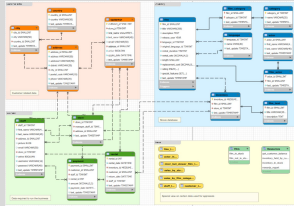
Project: files structure:

project/

- main.py	# entry point to the application
- dbmaaster.py	# module for working with the database
- query.py	# module for SQL queries - movie search logic
- utils.py	# functional module
- gui.py	# module for displaying results
- error_handler.py	# handle and log an error
- .env	# environment variables(e.g.database credentials)
- .gitignire	# tells GitHub what to ignore when loading
- requirements.txt	# description of imported project modules
- readme.md	# project information for GitHub

Project implementation

SAKILA DataBase structure:

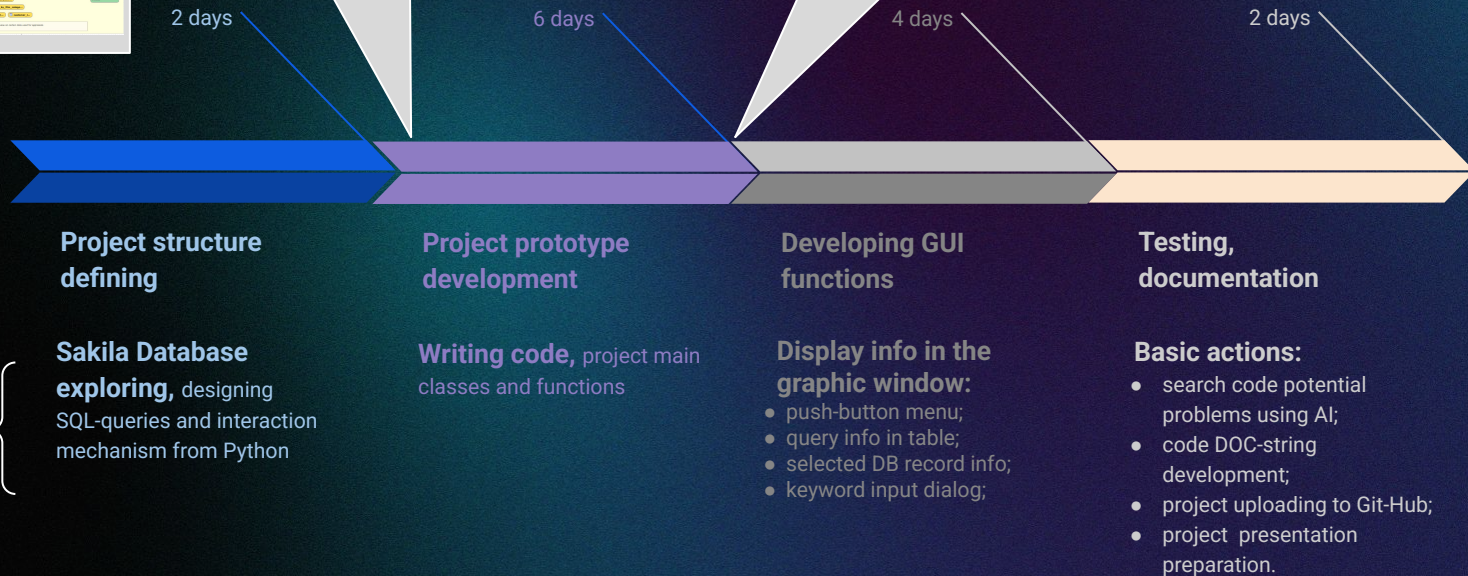


In addition to the main assignment realized:

- search by **actor**;
- added logic to **keyword search** in movie **Title**, movie **Description** or in **both** fields.

The GUI using idea reasons:

- intuitive interaction;
- improved perception of information;
- ease of use;
- minimization of manual input and potential errors;



Discoveries / Difficulties while Project preparation

Discoveries:

External modules using: integrating modules for working with the database and creating a GUI led to more efficient and simple solutions;

Unit testing: unit testing using AI helped to identify and fix errors early in the development process and make better structure code;

Code documentation: introducing docstrings and following the PEP 8 style significantly improved the readability and code maintainability.

Difficulties:

Database Setup: The first and most significant challenge was setting up and managing the database, including creating and updating tables from Python;

Performance Optimization: Optimizing queries and improving response times to improve application performance;

Error Handling: Errors and exceptions had to be handled carefully, especially when there were problems connecting to the database;

GUI: learning the tkinter module, understanding the logic of the library's classes and methods, the hierarchy of the window interface.

Thank you for attention



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**Analyst in Training, Data Analyst course,
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“Data analytics is the bridge between quantitative data and strategic decisions. It helps businesses understand what's happening, why it's happening, and what can be done to make a difference.”

/James Green, author of “Data: The New Competitiveness Factor”/