



Data Structure

Project

REVALUATION

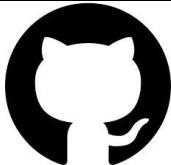


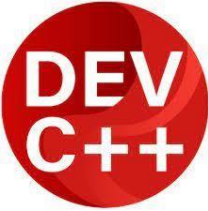

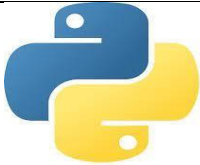


INSTRUCTOR:

Sir Fahad Sherwani

GROUP MEMBERS:

| | |
|-----------------|------------|
| SUFIYAAN USMANI | (21K-3195) |
| YOUSUF AHMED | (21K-4594) |
| QASIM HASAN | (21K-3210) |

TOOLS, LANGUAGES AND LIBRARIES

| | | |
|----|---|-----------------------|
| 1. |  | Git-Hub |
| 2. |  | MS Visual Studio code |
| 3. |  | DEV C++ |
| 4. |  | DEV C++ RED |
| 5. |  | RAY LIB |
| 6. |  | PYTHON |
| 7. |  | GIT |
| 8. |  | EXCEL |

DESCRIPTION:

Our "Revaluations" project combines a property management system and a property/real estate prediction system to give us the best information about any available real estate and an outlook on how much a particular property or the area in which it is located will increase in value over time.

On order to access the data that is stored in an excel sheet, where we will be using both our management and prediction applications, we have used data structures including arrays, link lists, and queues.

Data set with multiple rows and over 100000 rows of data, we have enough of alternatives to find the desired attribute, as well as its value and potential future worth.

Other than that there are features in our application such as email forwarded to the user or accessing the entire catalogue of properties.

Machine Learning and data science has been used in our project to perform our prediction system for the properties it will be working on the data available in the dataset and give a future growth and decline by analysing the data.

C++, C and Python are the programming languages that have been used in our project.

Additionally, we created a GUI for our programme to make it a more user-friendly application. For this purpose we have used raylib C library.

Problem Faced while Coding:

- I. We have difficulty in managing the data of almost 10 columns as the data in large amount are never 100% accurate and have to clean up a large chunk of data.
- II. On the other hand the decision to use some particular data that will help us in our prediction code was a also a minor problem
- III. Other than that to use correct data structures such as use the best searching or sorting algorithm and using stack and queue only were there LIFO/FIFO logic is being utilized.
- IV. Error checking was also a concern that the data we are inputting should match the format of generalized data so that we can perform operations easily.
- v. Implement classes correctly to make a logical connection/inheritance and make encapsulation and privacy a priority.

Overcome Problem in coding:

- I. We have data cleaned and have reached from 20% to above 65% accuracy in our excel sheet dataset.
- II. We have used square feet ,price ,bedrooms as criteria to predict the growth or decline of a real estate.
- III. We have made a proper use of data structures through the program .
- IV. We have put a limit when user is inputting so he is not able to enter alphabets in a numeric data type a check function will be available before the variable is assigned a value.

FEATURES IN THE CODE:

Following are the features available in the program.

- i. We have made several classes in the class to implement Object Oriented Programming.

Following are the classes:

- Property Class
- User Class
- Customer Class
- Stack Class
- Email Class
- EmailQueue Class
- Properties Class

- ii. Data Structures are used to make all the functionality of the project.

The Following Data Structures are used in our project.

- Array
- Stack
- Queue
- Sorting
- Searching

• Link List
iii. Email will be generated after creation of user account or while buying a property. For this purpose email mime python library has been used.
iv. Reading data

from a excel file to be used in prediction or while searching or sorting.

- v. GUI is made to make user friendly interface for efficient used
- vi. Report generate by pandas library by reading excel file.

MACHINE LEARNING:

Machine learning is the development of computer programs that can access data, and through a series of algorithms use the data to learn for itself what action should be taken based on that data.

DATA SCIENCE:

Identifying the data analytics problems that offers the greatest opportunities. Determining correct data set and variables.

PROGRAMMING LANGUAGES IN USE:

1. C++ Language:

Our application implements numerous data structures using the C++ language, and by using C++ OOP and programming, we have organised the code into a logical and readable form.



2. C Language:

C language is mainly used for building an operating systems and used in backend of our os. In order to leverage built-in functions, we have used libraries written in the C programming language. These libraries are also used to implement the sending of emails as well.



3. RAYLIB Library:

We have created a powerful interface using the Raylib Language, a well-known gui-based version of C++, it is actually a simple and easy to use library generally used for programming videogames Gui. Therefore we have used in order to make user-friendly programmes accessible to the user.



4. Excel Sheet:

The Excel sheet will be used to keep track of the extensive property data, as well as to save the sold properties, create copies of the current file, and maintain user data sheets.



5. Python Language:

Python is commonly used for developing websites and software and data visualization. The machine learning and data science prediction system we created for our property was coded in Python. Additionally, it is utilised in email code.

Following are the Python Library used in the program.

| | |
|---|---------------------------|
|  | Pandas Libraries |
|  | Sklearn(Machine learning) |

| | |
|---|--------------------------------|
|  | SeaBorn(Data Visualization) |
|  | Email MIME(smtplib) |

KNOWLEDGE WE GAINED AFTER COMPLETION OF OUR PROJECT:

- Debugging and error solutions.
- Data visualization from excel sheet
- Working with multiple languages
- Using OOP and data structures as together.
- Using python built in libraries.
- Using Raylib to built GUI.
- Using github and git as it is very well use in professional life as well.
- Proper Implementation of many data structures together.

License:

MIT License

Copyright (c) 2022 Sufiyaan Usmani

Permission is hereby granted, free of charge, to any person obtaining a copy of this software and associated documentation files (the "Software"), to deal in the Software without restriction, including without limitation the rights to use, copy, modify, merge, publish, distribute, sublicense, and/or sell copies of the Software, and to permit persons to whom the Software is furnished to do so, subject to the following conditions:

The above copyright notice and this permission notice shall be included in all copies or substantial portions of the Software.

THE SOFTWARE IS PROVIDED "AS IS", WITHOUT WARRANTY OF ANY KIND, EXPRESS OR IMPLIED, INCLUDING BUT NOT LIMITED TO THE WARRANTIES OF MERCHANTABILITY, FITNESS FOR A PARTICULAR PURPOSE AND NONINFRINGEMENT. IN NO EVENT SHALL THE AUTHORS OR COPYRIGHT HOLDERS BE LIABLE FOR ANY CLAIM, DAMAGES OR OTHER LIABILITY, WHETHER IN AN ACTION OF CONTRACT, TORT OR OTHERWISE, ARISING FROM, OUT OF OR IN CONNECTION WITH THE SOFTWARE OR THE USE OR OTHER DEALINGS IN THE SOFTWARE.

