**Data Structure and Algorithms.**

**Midterm Project Final Report.**



**Project Title:**

Hotel Pricing Analytics

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**Section:**

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**Aims and Objectives**

Aims and objectives of this project are:

* To make a project that named as hotel pricing analytics. As the name indicate, this user friendly system will collect a large amount of data about hotels and display it to user who required this information.
* User Interface will be simple and user friendly.
* This project is especially helpful and useful for those who often go for hoteling for any reason whether for official or entertainment trip to other countries and they want information such as charges hotels in different countries of world.
* This system will sort data by applying different sorting algorithms such as counting sort, bucket sort, insertion sort, selection sort, quick sort etc.
* This system will also search data by applying different searching algorithms such as binary search and linear search.
* This project will work on data obtained by web scrapping. By which large amount of data is scrapped from a website named as Booking.com. Different sorting and searching algorithms will be applied on this data.

**Learning Outcomes**

In this section, we will throw light on learning outcomes that is what we learnt from this project names as hotel pricing analytics.

Following are the learning outcomes:

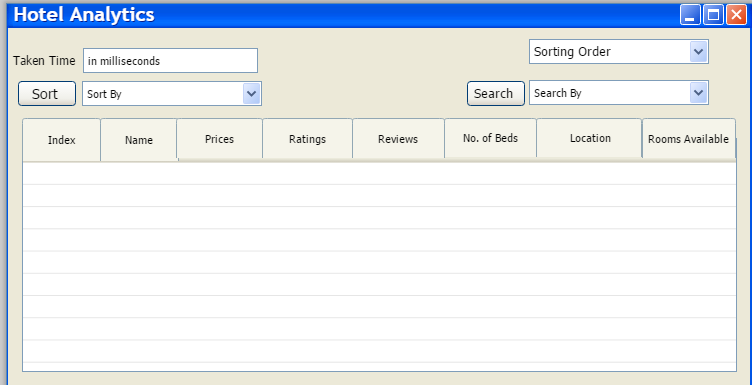
* Clear concepts of Data Structure
* Implementation of different sorting algorithms on large group of data
* Implementation of different searching algorithms on large group of data
* Implementation of multi-level sorting
* Implementation of composite filters
* Web Scrapping
* Python language
* UI using pyQt
* Integration of UI
* Designing a user friendly UI

**Data Scrapping**

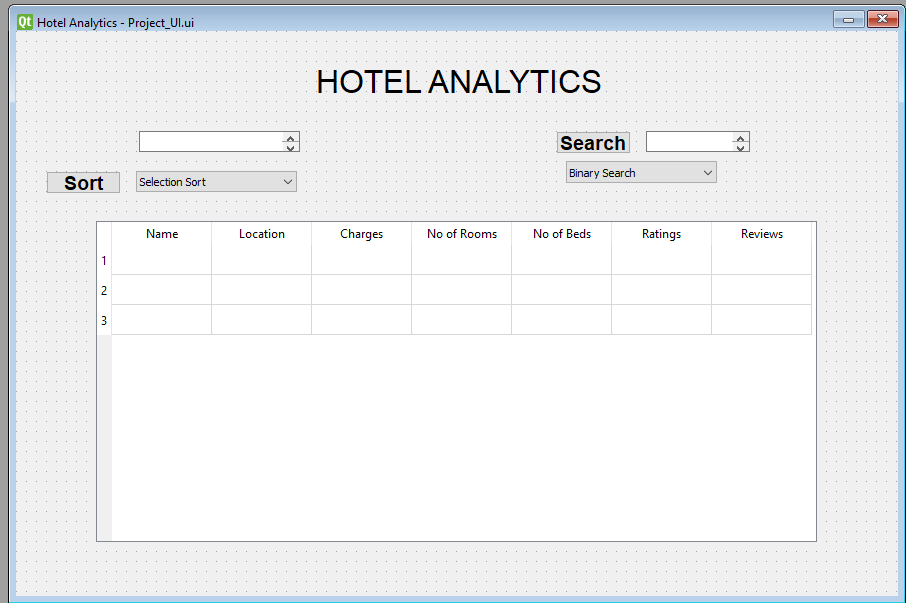
|  |  |
| --- | --- |
| **Details** | Data Scrapping is the first and most important step of this project.  Data scrapping is the best way to get a large amount of data from websites having huge amount of data.  In order to implement different sorting and searching algorithms, we require data. So in this project we scrapped a large group of data from Booking.com. This website contains data of worldwide hotels country and region wise. From this website we scrapped data about worldwide hotels, because this project is about hotels analytics. We gathered data about hotels in order to apply different algorithms on it as per requirements of this project.  Different types of sorting and searching algorithms are applied on this scrapped data having different attributes. |
| **Source** | Source of scrapping is:  <https://www.booking.com/index.en-gb.html?aid=100994;sid=35e8f7e4419f617e5860e97b5ccf72df;sig=v12tGK1KnU> |
| **Attribute Details** | |  |  |  | | --- | --- | --- | | Name | Data Type | Description | | Name of Hotel | String | This attribute is for storing name of hotel. | | Location | String | This attribute is for storing location of hotel. | | Prices | Integers | This attribute will store prices of hotels. | | Ratings | String | This attribute will store ratings of hotels. | | Reviews | String | This attribute will store reviews about hotels. | | No of rooms | Integers | This attribute will store no of rooms available in the hotel. | |

**Project UI**

* Pencil tool design is:



* pyQt UI is:



**Component Details:**

|  |  |  |
| --- | --- | --- |
| UI Component Name | Type of UI component | Purpose of UI Component/Other details |
| Data Showing Table | Table | Purpose of this component is to show data according to requirement of user. |
| Label for Time | Label | Purpose of this component is to label the time in milliseconds. |
| TextField for Time | TextField | Purpose of this text field is to show time taken in milliseconds. |
| Sorting order dropdown | Dropdown | Purpose of this component is to show  different options of sorting whether  ascending/descending or alphabetic  order to user. |
| Searching dropdown | Dropdown | Purpose of this component is to show  different options of searching algorithms  which to select. |
| Sorting algorithms dropdown | Dropdown | Purpose of this component is to show  different options of sorting algorithms  which to select. |
| Label for Sorting | Label | Purpose of this component is to label the  sotings. |
| Label for Search | Label | Purpose of this component is to label the  searching. |
| Button to load Data | Button | Function of this button is to load data. |

**Algorithms**

In this project, when large amount of data will be collected by scrapping, then different type of algorithms will be applied on it in order to perform operations.

Following algorithms will be applied on scrapped data:

* Sorting algorithms
* Searching algorithms
* Multi-level Sorting
* Composite filters

**Sorting Algorithms:**

* Insertion Sort
* Merge Sort
* Quick Sort
* Selection Sort
* Hybrid Sort
* Counting Sort
* Bucket Sort
* Radix Sort