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| **Data Structures and Algorithms** |
| Train Problem |
| **Course Project Report** |

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| **School of Computer Science and Engineering**  **2023-24** |

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**1. Course and Team Details**

**1.1 Course details**

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| **Course Name** | Data Structures and Algorithms |
| **Course Code** |  |
| **Semester** | III |
| **Division** | A |
| **Year** | 2023-24 |
| **Instructor** | Mr. Prakash Hegade |

**1.2 Team Details**

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| --- | --- | --- |
| **Si. No.** | **Roll No.** | **Name** |
| 1. | 101 | Anirudh R. Hanchinamani |
| 2. | 154 | Om Muddapur |
| 3. | 158 | Sumedh S. Kaulgud |
| 4. | 159 | B. R. Abhishek |

**1.3 Report Owner**

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| --- | --- |
| **Roll No.** | **Name** |
| 101 | Anirudh R. Hanchinamani |

**2. Introduction**

The project began with the examination of a comprehensive document provided to our team—an insightful “Streets” paper that served as a repository of prevalent urban challenges. From the myriad of issues presented, our collective decision converged on a problem that resonated with both common experiences and personal observations. The focal point became addressing the challenges faced by individuals who are new to the city, particularly in the context of urban rail transportation—a multifaceted challenge.

Following are the Sub Modules that we have enlisted in this vast challenge of train problem,

* Information and Communication.
* Infrastructure and Facilities.
* Passenger comfort and assistance.
* Sustainability and Green Initiatives.

**3. Problem Statement**

The Train Problem: Seeking the most viable options to improve passenger mobility and provide better accommodations.

**3.1 Domain**

Introduce your problem statement here. What problem are you automating? A problem statement can be described in about 4-5 sentences. Explain why you selected as the need statement from the white paper? What motivated you?

**3.2 Module Description**

**Module** **Name**: Passenger comfort and assistance.

This module focuses on providing assistance to passengers, the primary objective is to address challenges encountered by individuals who are new to the platform and unfamiliar with the city they are in. The module aims to provide comprehensive solutions to common queries faced by such individuals.

One notable feature is "City Promotions," allowing users to access information about the top cities in the state with detailed descriptions. This feature assists newcomers in discovering appealing destinations within the region. Additionally, the module encourages user engagement by incorporating a feedback mechanism, enabling continuous improvement and customization of the assistance provided.

To enhance user support within the railway station premises, the module offers features like navigation assistance. Users, especially those unfamiliar with the layout of the railway station, can rely on the system to guide them within the station, ensuring seamless navigation to their desired platforms. Furthermore, the module incorporates a search functionality, allowing users to find specific places within the station and receive directions to the corresponding platforms.

Recognizing the need for accommodations, the module extends its functionality to include information about dormitory options within or near the station premises. Users can conveniently view available dormitory facilities and proceed to book them through the system.

Furthermore, the module offers users the opportunity to take notes, view their notes, and mark them as completed. This functionality enhances the user experience by providing a convenient way to organize and track tasks or important information during their journey. Whether it's jotting down reminders, making to-do lists, or noting essential details, this feature adds a personalized and efficient dimension to the overall assistance provided by the module.

In summary, this module within Passenger Comfort and Assistance is dedicated to creating a user-friendly interface addressing the unique challenges faced by individuals new to a city and its railway station. Through features such as City Promotions, user feedback, navigation assistance, and dormitory options, the module significantly enhances the overall comfort and experience of passengers in unfamiliar surroundings.

**4. Functionality Selection**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Si. No.** | **Functionality Name** | **Known** | **Unknown** | **Principles applicable** | **Algorithms** | **Data Structures** |
|  | Name the functionality within the module | What information do you already know about the module? What kind of data you already have? How much of process information is known? | What are the pain points? What information needs to be explored and understood? What are challenges? | What are the supporting principles and design techniques? | List all the algorithms you will use | What are the supporting data structures? |
| 1 |  |  |  |  |  |  |
| 2 |  |  |  |  |  |  |
| 3 |  |  |  |  |  |  |
| 4 |  |  |  |  |  |  |
| … |  |  |  |  |  |  |
| … |  |  |  |  |  |  |

**5. Functionality Analysis**

For each module you have implemented, describe your workflow and write its efficiency analysis. Create as many sub headings as necessary. It is compulsory to do efficiency analysis for each module.

**6. Conclusion**

What are you taking away as learning from the project? Describe your learning and project takeaways.

**7. References**

Cite your references. Examples are given below:

[1] Thomas H. Cormen, Clifford Stein, Ronald L. Rivest, and Charles E. Leiserson. 2001. Introduction to Algorithms (2nd ed.). McGraw-Hill Higher Education.

[2] lbackstrom. The Importance of Algorithms. Link: https://www.topcoder.com/community/data-science/data-science-tutorials/the-importance-of-algorithms/. Site last accessed on: 23 October 2017.

Notes:

* www.google.com or www.wikipedia.com etc cannot be a reference.
* References can be in IEEE, APA or any other standard format. But put all of them in one single format.
* Remove all the template data before submitting. Example: These notes should not be part of your report.
* Do not deviate from the template provided at any case.
* Submit report in .pdf format.
* Report submissions will be along with code and in soft copy only. NO HARD COPIES.
* Code and report copy has to be emailed to concerned faculty soon after the exam scheduled on 23 / 24th Jan 2024

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