**Data Structures and Algorithms [23ECSC205]**

**Course Project – Phase I**

**Functionality Identification**

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| Problem Title: | | | | |
| **SI. No.** | **Functionality Identified** | **Description** | **Owner** | **Probable Tools** |
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Data collection:

* Explain here how you will gather data. What kind of data is available is online and for which place?
* You are expected to work on large and manageable data set
* Look for government sites (most stat data is available)

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| **Information and Communication** | | | |
| **Sl no** | **Function** | **Description** | **Tools** |
| 1 | Recommendation Engine | An application to recommend to the passengers, optimal hotels, restaurants etc. | Hash map |
| 2 | Streamlining Booking and Boarding Process | Making it easier and more convinient for the prospective passenger to aquire train tickets. | Queue |
| 3 | Crowd Management | Using CCTV cameras to monitor crowd movements and do crowd management | Arrays |
| 4 | LED Screening of Easily Accessible Info | Making it easier for passengers to get relevent information about things such as next incoming train times, platform numbers etc. | Linked List |
| 5 | Information Fetching | Fetching data sets from various sources | Hash map/Dictionary |
| 6 | Comfortable Seats | Providing better seating for the passengers | Arrays |
| 7 | Personalized Recommendations | Recommendation engine's functionality to provide recommendations relevant to the user | Arrays, Hash Maps |
| 8 | Proper Windows Placement | Optimal placement of windows within a train compartment | Linked List |
| 9 | Upcoming Stations Information | Providing the passengers, information about next stations | Linked List |
| 10 | Real-Time Monitoring | Real-Time Monitoring of passengers to provide additional functionality for the application | Graphs, Trees |

Om Muddapur

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| Problem Statement: Infrastructure and Facilities | | | |
| S.Num | Fuctionality | Description | Tools |
| 1 | Efficient Announcement Speaker | Announcing information to passengers about train timings at different platforms. | Arrays, Queues |
| 2 | Communications Between stations | Stations communication to provide information about train’s departing time, etc. | Linked list |
| 3 | Information Organization | Organization of required information to represent it to the suitable users. | Trees , Structure |
| 4 | Multilingual Features | Information at stations should be in English, national language, home language. | Trees |
| 5 | Entertainment Facilities | As journeys will be long some entertainments like T.V., etc can be installed in trains. | Queues |
| 6 | Proper lighting facilities in train | Bulbs that consume less power and also give illuminations should be installed. | Linked Lists |
| 7 | Displaying city maps | City maps at stations help people to navigate their desired location easily. | Graphs |
| 8 | Parking space efficiency in stations | As we know Indian families, to send one person many people come to just send him. So, we should make proper arrangements for car, bike, etc parking space. | Sorting Algorithms |
| 9 | City promotions | Providing city information like what it is famous for, etc at respective stations. | Heaps |
| 10 | Work space provisions | Ensuring the provision of adequate facilities and workspace for individuals during their waiting period for trains, as needed. | Linked Lists |

Anirudh R H

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| Problem Statement: Passenger comfort and Amenities | | | |
| S.Num | Fuctionality | Description | Tools |
| 11 | Platform Assistance | Helping passengers find their way around the train station, providing real-time updates and guidance through digital signs, apps, or staff. | hash map |
| 12 | Passenger Accommodation | Ensuring comfortable seating, sufficient legroom, and amenities like charging ports for a pleasant travel experience. | linked lists |
| 13 | Shop Location Generator | Simplifying shopping at the station by offering tools like apps or kiosks that guide passengers to nearby shops. | Hash Map |
| 14 | Toilets and Toiletries | Maintaining clean and well-equipped restrooms on trains and at stations, with essential toiletries for passenger hygiene. | linked lists |
| 15 | Drinking water facilities | Installation of water dispensers at strategic locations in stations and within train cars to provide passengers with convenient access to clean drinking water. | linked lists |
| 16 | Rest Areas | Designating comfortable spots within stations for passengers to relax, featuring seating, charging stations, and possibly recreational facilities. | trees |
| 17 | Person-to-Person Assistance | Providing real-time assistance to passengers through station staff or digital platforms for inquiries and guidance. | queues |
| 18 | Lounges for Long Journey trains | Establishment of exclusive lounges featuring comfortable seating, refreshments, and entertainment options for passengers on extended train journeys. | arrays/lists |
| 19 | Dormitories for accomodations at stations | Provision of budget-friendly sleeping accommodations within or near stations for passengers requiring overnight stays or layovers. | Linked lists |
| 20 | City Promotions | Collaboration with local businesses and tourism boards to promote city attractions and services at train stations, enriching the passenger experience with destination-related information | linked lists |

Abhishek B R