|  |
| --- |
| **Data Structures and Algorithms** |
| Visualizer for Patient Routing and Ambulance Dispatch |
| **Course Project Report** |

|  |
| --- |
| **School of Computer Science and Engineering**  **2022-23** |

**Contents**

|  |  |
| --- | --- |
| **Sl. No.** | **Topics** |
| 1. | Course and Team Details |
| 2. | Introduction |
| 3. | Problem Definition |
| 4. | Functionalities |
| 5. | Project Tools |
| 6. | Learning and Takeaway |
| 7. | References |

**1. Course and Team Details**

**1.1 Course details**

|  |  |
| --- | --- |
| **Course Name** | Data Structures and Algorithms  (Theory and Lab) |
| **Course Code** | 20ECSC205 and 19ECSP201 |
| **Semester** | III |
| **Division** | E |
| **Year** | 2022-23 |
| **Instructor** | Bhagya Sunag |

**1.2 Team Details**

|  |  |  |
| --- | --- | --- |
| **Si. No.** | **Roll No.** | **Name** |
| 1. | 541 | Pranav Bhat |
| 2. | 543 | Vats Mishra |
| 3. | 553 | Darshan Mudakavi |
| 4. | 512 | Manjunath Madar |

**2. Introduction**

Data Structures and Algorithms course helps in viewing real world problems in a more logical way. It helps in creating a bridge between the person and computer. DSA course lays a foundation for further studies in the field of Algorithms and the efficient ways of carrying out the tasks.

**3. Problem Statement**

Transferring Patients and Organs in immediate need of care and transport is a hassle with today’s traffic. To ensure that all the patients are rescued as soon as possible would be to find a route such that it has the least traffic and time required to reach the patient. The patients would be sorted based on their critical condition/priority. Higher the priority, the sooner the patient needs to be rescued.

**4. Functionalities**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **SI. No.** | **Function Name** | **Description** | **DS and Algorithm Used** | **Efficiency** |
|  | onClickGen() | Listen to button clicks on frontend and run respective functions based on input | JavaScript DOM |  |
|  | generateNodes() | Generate nodes or locations compatible with the graph plotting function | Array and Loop | O(n) |
|  | sortpatients() | Sort patients based on priorities and set destination to the highest priority patient | Selection Sort and Array | O(n2) |
|  | createMatrix() | Read input from user and create matrix suitable for program | Strings | O(n2) |
|  | createEdges() | Create edges suitable for program | Array | O(n) |
|  | createRandomMatrix() | Create matrix with changing traffic(weights) every 1.5 seconds | Math.Random() function used | O(n2) |
|  | Dijkstra() | Find shortest path from user defined source and destination | Dijkstra and Arrays | O(n2) |
|  | generateGraphNew() | Depict the input graph visually using the library D3.js | D3.js library used |  |
|  | displayPatientDet() | Display patient details of rescued patients | JavaScript DOM and Arrays | O(n) |
|  | Searchpatient() | Search database for patients in the admitted section | Naïve String Search and strings | O(n) |
|  | Getroomno() | Get the room number of the admitted patient | Simple fetch | O(n) |
|  | dischargePatient() | Discharge patient from the database | Simple delete | O(n) |

**5. Project Tools**

|  |  |  |
| --- | --- | --- |
| **Si. No.** | **Measure** | **Value** |
|  | Total Functions in Project | **16** |
|  | Total number of lines of code  (Including comments, newlines etc.) | **1014** (including HTML, CSS and Database) |
|  | Number of Errors | None |
|  | Number of Warnings | None |
|  | Team Satisfaction about Project | 95 |

**6. Learning and Takeaway**

What are you taking away as learning from the project? Describe your learning and project takeaways. Also complete the contribution table below.

|  |  |  |  |
| --- | --- | --- | --- |
| **Si. No.** | **Roll** | **Name** | **Contribution**  **Rank** |
|  | 541 | Pranav Bhat | 1 |
|  | 543 | Vats Mishra | 2 |
|  | 553 | Darshan Mudakavi | 2 |
|  | 512 | Manjunath Madar | 2 |

**7. References**

[1] D3.js Library: Data Driven Documents.

Link: https://d3js.org/

[2] JavaScript DOM handling: Integrating HTML and JavaScript

Link: https://devdocs.io/javascript/

**~\*~\*~\*~\*~\*~\*~\*~**