Team Name:

Team Email:

Number of members: 4

**Members’ Info:**

|  |  |  |
| --- | --- | --- |
| Member Name | ID | Email |
| Ahmed Atta Abdallah Abdelhay | 9202139 | Ahmed.abdallhay01@eng-st.cu.edu.eg |
| Doaa Magdy Ibrahim Mohamed | 9202521 | doaa.mohamed01@eng-st.cu.edu.eg |
| Rufaida Muhammad Sayed Ahmed | 9202550 | Rufaidah.ahmed01@eng-st.cu.edu.eg |
| Ahmed Alaa El-Sayed Arabi Zidan | 9202141 | ahmed.zedan01@eng-st.cu.edu.eg |

**Project Data Structures**

|  |  |  |
| --- | --- | --- |
| List Name | Chosen DS | Justification |
| All Missions and Rovers | Bag ADT. | Clear ()  Add () |
| Events. | Queue ADT | FIFO.  - The Events are entered in ascending order, so we execute them in that order |
| Available Rovers (Emergency, Mountainous, and Polar). | 3 Priority Queues ADT (Sorted by the Speed) | Searching O(1)  Move O(1), we will need to move it from one list to another. |
| In-Execution Rovers. | List ADT | Move without shifting.  Delete from anywhere.  Searching O(n). |
| Check-Up Rovers. | List ADT | Move O (1)  Traversal O(n) |
| Waiting Emergency Missions | Priority Queues ADT | Dequeue According to the priority of each Mission. |
| Waiting Mountainous Missions | List ADT | - Searching O(n) : for Cancellation and Promotion Requests. |
| Waiting Polar Missions | Queue ADT | FIFO |
| In-Execution Missions. | List ADT | -Traversal  - Searching, in case of a Cancellation Request and  in case a Mission has failed. (BONUS) |
| Completed Missions | List ADT | -Traversal |

- All the Implementations will be Using Linked List, as There is a lot of delete and move operations and to get rid of the overhead of the Size.

- We decided to make 2 main Linked Bags to store all the missions and rovers, to make sure that there is just one copy of each mission and rover, and just manipulate them using pointers.