Team Name: The Phoenix

Team Email: ahmed.zedan01@eng-st.cu.edu.eg

Number of members: 4

**Members’ Info:**

|  |  |  |
| --- | --- | --- |
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**Project Data Structures**

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| --- | --- | --- |
| List Name | Chosen DS | Justification |
| All Missions and Rovers | Bag ADT. | Clear () -> before the end of the program.  Add () -> O(1) |
| 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 the first element from one list to another. |
| In-Execution Rovers. | List ADT | Move without shifting.  Delete from anywhere.  Searching -> O(n) when cancelling a mission or if The Mission has been completed. |
| 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.  -Traversal |
| Waiting Polar Missions | Queue ADT | FIFO |
| In-Execution Missions. | List ADT | -Traversal  - Searching, in case of a Cancellation Request or  in case a Mission has failed. (BONUS) |
| Completed Missions | List ADT | -Traversal to print it every day |

- 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.