|  |  |
| --- | --- |
| AIN SHAMS UNIVERSITYFACULTY OF ENGINEERINGi-CREDIT HOURS ENGINEERING PROGRAMS *Computer Engineering and Software Systems Program* | Logo  Description automatically generated |

|  |  |
| --- | --- |
| ***Spring 2021*** | **Course Code: *CSE 472*** |
| **Artificial Intelligence** | |

**Course Project**

Submitted by

|  |  |  |
| --- | --- | --- |
|  | **Name** | **ID** |
| **1** | **Yousef Mohamed Shafik Khalil** | **18P8661** |
| **2** | **Mahmoud Mohsen Mahmoud** | **18P2365** |
| **3** | **Mahmoud Maged Mahmoud Mahmoud Hafez** | **18P2847** |
| **4** | **Mohamed Ahmed Mohamed Badr** | **18P8994** |

**Pre requirements to run the program:**

1. Python shell installed on the PC.
2. Kivy GUI module imported to the IDE.  
   Link for installation: [Kivy: Cross-platform Python Framework for NUI Development](https://kivy.org/#home)

**Program buttons explained:**

Graphical user interface, text

Description automatically generated



1.  button: Used to browse through system files to save the path where you want.
2.  button: Save a screenshot of the path in default path.
3. button: Used to clear selected node.
4.  button: Used to create a new node.
5.  button: Used to create a directed edge.
6.  button: Used to create undirected edge.
7. White box: used to enter heuristic, cost or maximum depth.
8.  Spinner: Used to choose between algorithms where the default is BFS algorithm.
9.  button: Used to run the algorithm.
10.  button: Used to reset the canvas.
11.  slider: If you slide to the right, it makes the sequence visualization slower. If you slide to the left, it makes the sequence visualization faster.

Program Demo:

Chart

Description automatically generated with low confidence

Chart, line chart

Description automatically generated

In the 2nd figure: output using A\* search algorithm

**Steps to run the Program:**

1. To create nodes: Press anywhere on the canvas.
2. If you want to create a heuristic, after creating a node, write the heuristic value in the white box.
3. After creating nodes, you can select two nodes to create an edge between them by pressing on the directed or undirected button.
4. After choosing type of edge, enter the cost value in the white box.
5. Press on algorithms list to choose the suitable algorithm.
6. After choosing the algorithm, press the run button to run the algorithm.

**Nodes colors explained:**

1. Green Node: Initial state (Start)
2. Red Nodes: Intermediate nodes.
3. Blue Nodes: Final state (end). (To create final node, press right click)
4. Purple Nodes: Nodes on the path.
5. Yellow Nodes: Visited nodes but not in the path.