Course No:CSE 2100

Course Title:Software Development Project I

Date of Submission:20 August 2022

Submitted To:

Dr. Boshir Ahmed

Professor,

Department of Computer Science & Engineering

Rajshahi University of Engineering & Technology

Submitted by:

Name: A.S.M.Montashir Fahim

Roll:1903110

Section: B

Project Title : Algorithm Visualizer in Windows.

Objective : In mathematics and computer science, an **algorithm** is a finite sequence of rigorous instructions, typically used to solve a class of specific problems or to perform a computation. Algorithms are used as specifications for performing calculations and data processing.

Sorting Algorithms are used to sort data according to a specific criteria.Here I used Insertion Sort and Bubble Sort.Both algorithms have Complexity of O(n^2),here n is number of elments in the list.We can sort data in ascending and Descending Order both.

Graph (sometimes called an *undirected graph* to distinguish it from a directed graph, or a *simple graph* to distinguish it from a multigraph) is a pair $G = (V, E)$, where V is a set whose elements are called *vertices* (singular: vertex), and E is a set of paired vertices, whose elements are called *edges* (sometimes *links* or *lines*).

The vertices x and y of an edge $\{x, y\}$ are called the *endpoints* of the edge. The edge is said to *join* x and y and to be *incident* on x and y. A vertex may belong to no edge, in which case it is not joined to any other vertex.
Depth First Search and Breadth First Search are used to traverse a graph.BFS is used to traverse the graph levelwise.Complexity of both algorithm is O(V+E) where V is number of nodes/vertices and E is number of Edges.

Our Objective is to visualize how these Algorithms work using animations to understand and learn the algorithm easily and visualize it.

Features:

1)Visualize Sorting Algorithm.

2)Count the complexity of Sorting Algorithm.

3)Visualize Depth First Search

4)Visualize Breadth First Search

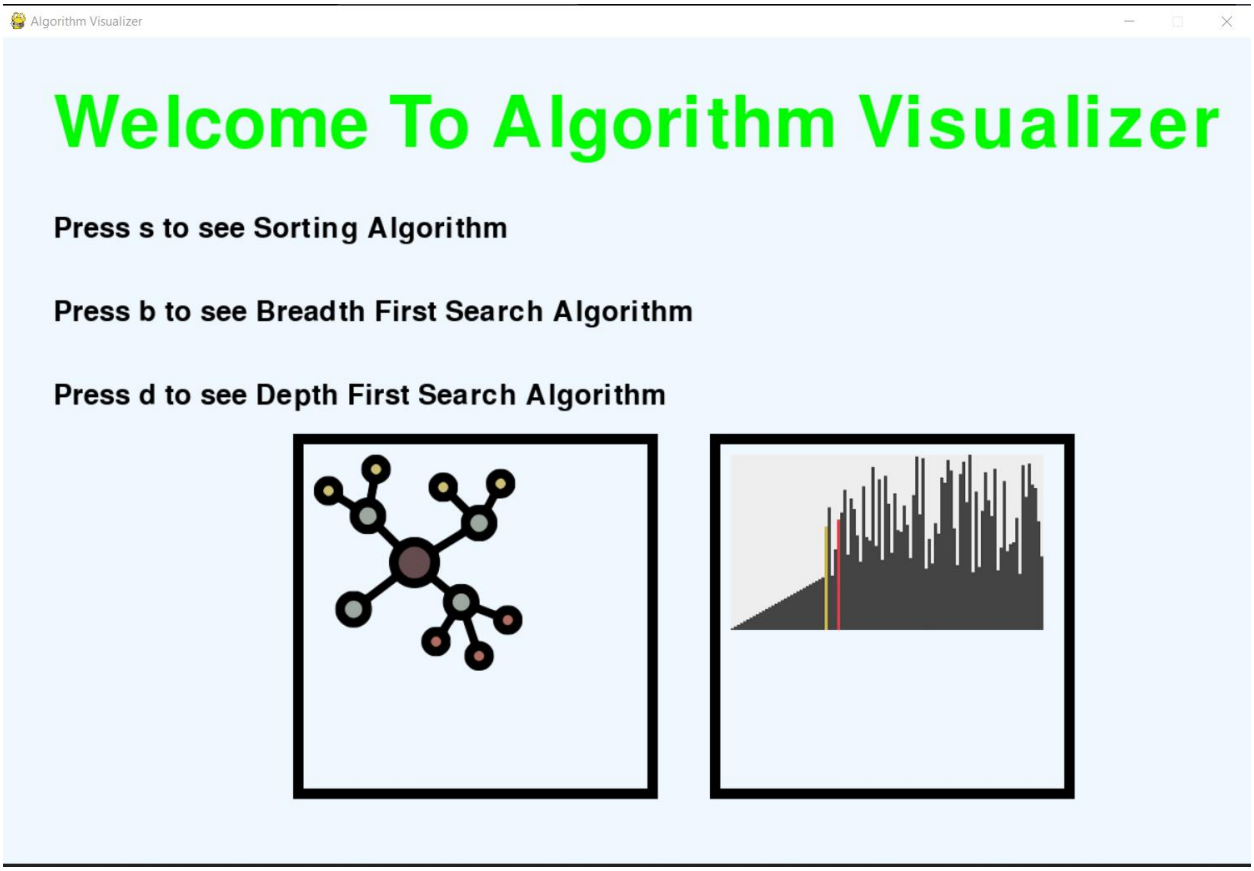
Tool:

Pygame module of **Python** to make animation and UI.

Algorithms and others made using **Python**.

Instruction:

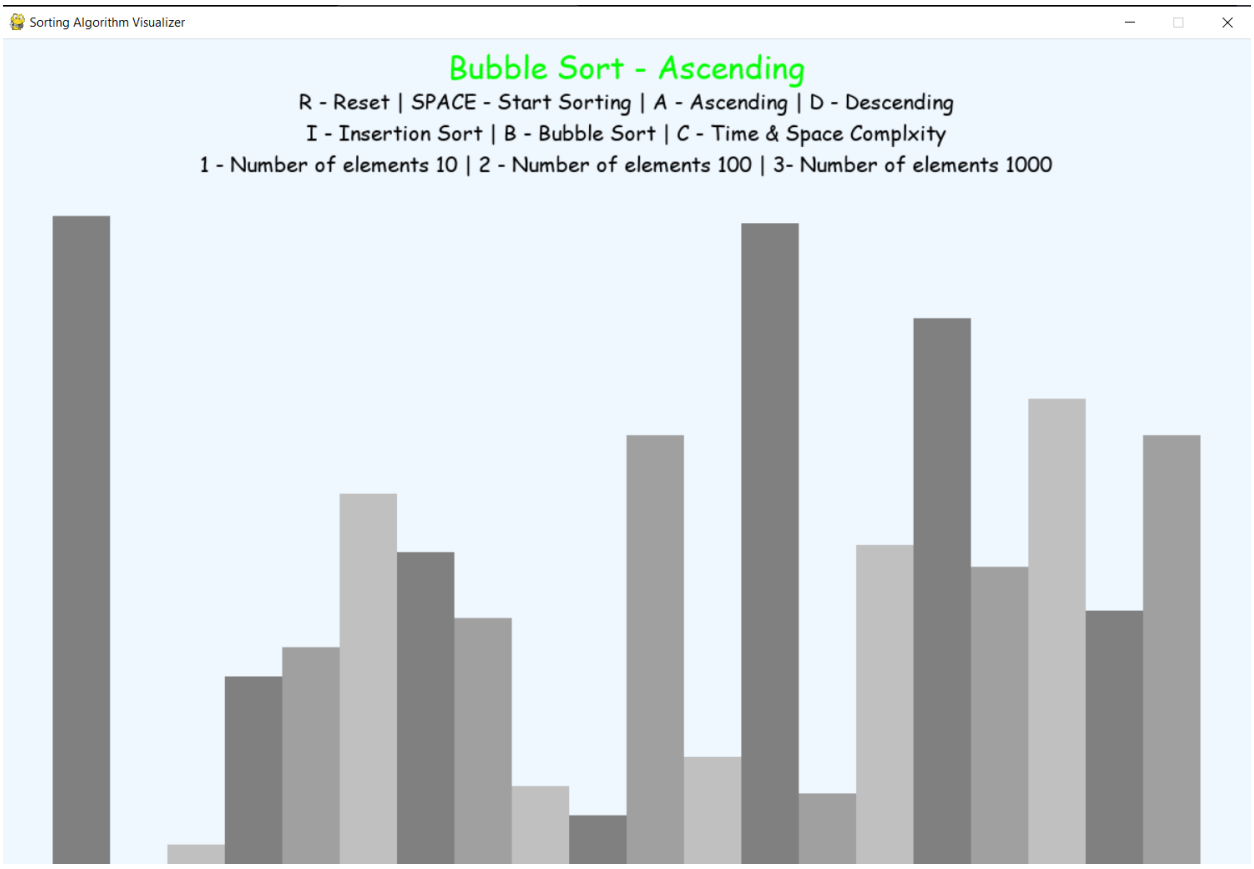
1)Press ‘s’ to see sorting,’b’ to see BFS,’d’ to see DFS



2)If you pressed ‘s’ first:

Than this window will appear

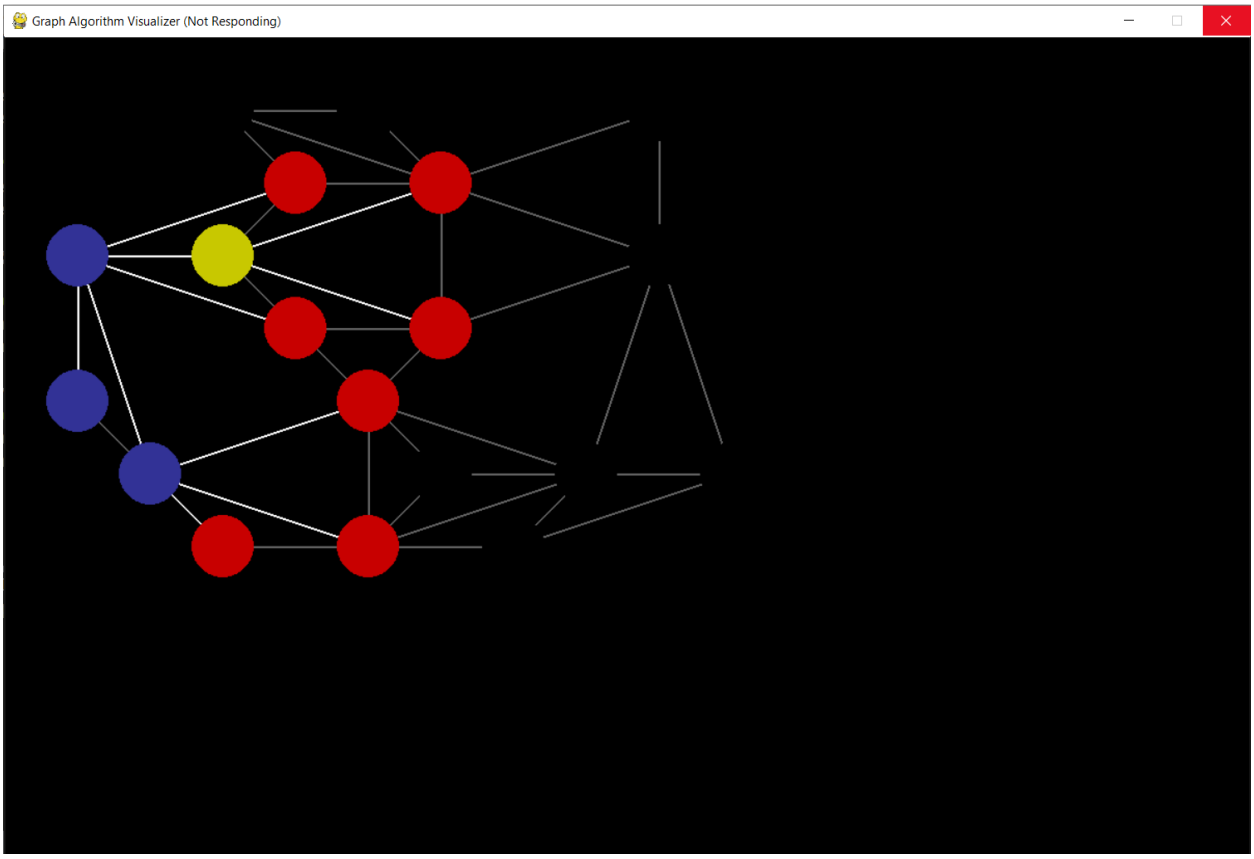
Than press s button and main sorting algortihm visualizer window will appear.



Follow the instructions written in the window.

2)If you pressed’b’:

Than the main BFS visualizer window will appear and you can see the animations:



3)If you Pressed’d’ than the DFS window will appear: