Name: \_\_Katie Prescott\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Date: 3/11/16\_\_\_\_\_\_\_

I pledge my honor that I have abided by the Stevens Honor System.

1. Adjacency Matrix:

|  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | ***1*** | ***2*** | ***3*** | ***4*** | ***5*** | ***6*** | ***7*** | ***8*** | ***9*** | ***10*** |
| ***1*** | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***2*** | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***3*** | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***4*** | 0 | 1 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***5*** | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 1 | 0 |
| ***6*** | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 1 | 0 | 0 |
| ***7*** | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |
| ***8*** | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 | 0 |
| ***9*** | 0 | 0 | 0 | 0 | 0 | 0 | 1 | 0 | 0 | 1 |
| ***10*** | 0 | 0 | 1 | 0 | 1 | 0 | 0 | 0 | 0 | 0 |

3. Breadth First Search order: **1, 2, 4, 5, 9, 7, 10, 3, 6, 8**

4. Depth First Search order: **1, 2, 5, 4, 9, 7, 10, 3, 6, 8**

5. a) Run time BFS on matrix:

b) Run time BFS on list:

6. a) Run time DFS on matrix:

b) Run time DFS on list:

2. Adjacency List:

|  |  |  |
| --- | --- | --- |
| **From:** | **To:** | |
| 1 | 2 | 4 |
| 2 | 5 |  |
| 4 | 2 |  |
| 5 | 4 | 9 |
| 9 | 7 | 10 |
| 7 | 5 |  |
| 10 | 3 | 5 |
| 3 | 5 |  |
| 6 | 6 | 8 |

7. Explain when an adjacency list is a better choice in efficiency of algorithm?

**Better when there aren’t as many edges, because it doesn’t need as much memory.**

**Fast to iterate through the edges, slow to determine the presence of an edge.**

8. Explain why topological sort is not possible on the graph above.

**Not possible because the 6 cycles back to itself.**

9. Topological sort order: **1, 4, 2, 5, 6, 8, 9, 7, 10, 3**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 2 | 3 | 4 | 5 | 6 | 7 | 8 | 9 | 10 |
| 0x | 2 | 2 | 1 | 2 | 0x | 1 | 1 | 1 | 2 |
|  | 1 | 1 | 0x | 1 |  | 0x | 0x | 0x | 1 |
|  | 0x | 0x |  | 0x |  |  |  |  | 0x |