

Started on	Tuesday, 11 April 2023, 9:24 AM
State	Finished
Completed on	Tuesday, 11 April 2023, 10:10 AM
Time taken	46 mins 47 secs
Marks	20/25
Grade	4 out of 5 (80%)

Question **1**
Incorrect
Mark 0 out of 1

Match the stepwise order of identifying the strongly connected components of a Directed Graph

Step 1

Compute DFS of the Graph with decreasing finishing time

✖

Step 3

Compute the Transpose of given Graph

✖

Step 2

Compute DFS of the Transpose with decreasing finishing time

✖

Your answer is incorrect.

The correct answer is: Step 1 → Plot the finishing time of each vertex,
Step 3 → Compute DFS of the Transpose with decreasing finishing time,
Step 2 → Compute the Transpose of given Graph

Question **2**
Correct
Mark 1 out of 1

Graph Theory is the study of

- Select one:
- ☐ a. Four quadrants of an axis based framework
 - ☒ b. Relationships between Objects ✔
 - ☐ c. solutions to solve community classifications
 - ☐ d. Interconnections of nodes

Your answer is correct.

The correct answer is: Relationships between Objects

Question **3**
Correct
Mark 1 out of 1

dfs_visit() is a subroutine called under *dfs()*

- Select one:
- ☒ True ✔
 - ☐ False

The correct answer is 'True'.

Question **4**

Correct

Mark 1 out of 1

Dijkstra's algorithm can handle negative weighted edges in a graph

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Question **5**

Correct

Mark 1 out of 1

Pick ALL the right answers about Dijkstra's algorithm

Select one or more:

- ☒ a. Dijkstra solves for S-S-S-Ps on +ve weighted edges ✓
- ☒ b. Dijkstra's algorithm cannot deal with negative weights edges ✓
- ☒ c. Dijkstra's algorithm uses a Greedy Strategy to solve to shortest paths ✓
- ☐ d. Path relaxation is not required in Dijkstra's algorithm
- ☒ e. Dijkstra's algorithm's running time varies with the type of Data type used to implement the Queues ✓

Your answer is correct.

The correct answers are: Dijkstra solves for S-S-S-Ps on +ve weighted edges , Dijkstra's algorithm uses a Greedy Strategy to solve to shortest paths, Dijkstra's algorithm cannot deal with negative weights edges , Dijkstra's algorithm's running time varies with the type of Data type used to implement the Queues

Question **6**

Correct

Mark 1 out of 1

Following are the 3 most famous ways to design algorithms (Pick 3 that you are aware of)

Select one or more:

- ☐ a. Algorithmic hardening
- ☒ b. Dynamic Programming ✓
- ☒ c. Divide and Conquer ✓
- ☒ d. Greedy Strategy ✓
- ☐ e. Naive method

Your answer is correct.

The correct answers are: Dynamic Programming, Greedy Strategy, Divide and Conquer

Question **7**

Incorrect

Mark 0 out of 1

What is "Network Flow" problem?

Select one:

- ☐ a. Problem associated with flow of packets within a network
- ☐ b. Problem that deals with finding most efficient methods to traverse edges
- ☒ c. Computational problem to determine "flow" in a network ✖
- ☐ d. Problem that deals with connecting vertices with or without weights

Your answer is incorrect.

The correct answer is: Problem that deals with finding most efficient methods to traverse edges

Question **8**

Incorrect

Mark 0 out of 1

6 vertices in a graph with degree 3 each will give you a minimum of how many edges?

Answer: ✖

The correct answer is: 18

Question **9**

Correct

Mark 1 out of 1

In Shortest Path algorithms, the key step of adjusting the edge weights as per the known parameters in order to attain the shortest path is called Edge

Answer: ✔

The correct answer is: relax

Question **10**

Correct

Mark 1 out of 1

A Graph can have more than one Minimum Spanning Tree with same cost but different paths

Select one:

- ☒ True ✔
- ☐ False

The correct answer is 'True'.

Question **11**
Correct
Mark 1 out of 1

Match the elementary logic of Graph algorithms with the reasoning words appropriately

- | | | |
|------|--|---|
| WHY | visit the vertices of the Graph | ✓ |
| HOW | Systematically follow the edges of the Graph | ✓ |
| WHAT | need to derive some info from the Graph | ✓ |

Your answer is correct.

The correct answer is: WHY → visit the vertices of the Graph, HOW → Systematically follow the edges of the Graph, WHAT → need to derive some info from the Graph

Question **12**
Incorrect
Mark 0 out of 1

In Breadth First Search technique, post initialisation, BFS

Select one:

- ☐ a. never whitens a vertex
- ☐ b. does not bother about colors of vertices
- ☒ c. whitens a vertex atleast once ✗
- ☐ d. always whitens a vertex

Your answer is incorrect.

The correct answer is: never whitens a vertex

Question **13**
Incorrect
Mark 0 out of 1

A Undirected Graph is ALWAYS connected if all pairs of vertices are connected by a path between them

Select one:

- ☒ True ✗
- ☐ False

The correct answer is 'False'.

Question **14**
Correct
Mark 1 out of 1

To programmatically solve a rubix's cube problem, what would be a better approach to adapt?

Select one:

- ☐ a. Rubix's cube problem cannot be solved by adapting a graph based approach
- ☐ b. Depth First Search
- ☒ c. Breadth First Search ✓
- ☐ d. Any approach will just do fine

Your answer is correct.

The correct answer is: Breadth First Search

Question **15**
Correct
Mark 1 out of 1

What is the expansion of the term DAG ?

Tip: Answer is Case insensitive but do not add special characters or leave more than one space between the words. Tool's decision about the answer is final.

Answer: Directed Acyclic Graph



The correct answer is: directed acyclic graph

Question **16**
Correct
Mark 1 out of 1

What are the valid edge types in a Graph?

Tip: Select ALL choices that are valid

Select one or more:

- ☐ a. Free Edges
- ☒ b. Direct Edges ✖
- ☒ c. Forward Edges ✔
- ☒ d. Tree Edges ✔
- ☒ e. Cross Edges ✔

Your answer is correct.

The correct answers are: Tree Edges, Cross Edges, Forward Edges

Question **17**
Correct
Mark 1 out of 1

The standard representations of a Graph are

Tip: choose more than one right answer if applicable

Select one or more:

- ☒ a. Adjacency Lists ✔
- ☐ b. Adjugate List
- ☐ c. Adjacency Spaces
- ☒ d. Adjacency Matrices ✔
- ☐ e. Adjacency Curves

Your answer is correct.

The correct answers are: Adjacency Lists, Adjacency Matrices

Question **18**
Correct
Mark 1 out of 1

SRTBOT is a technique used in Divide and Conquer algorithm design

Select one:

- ☐ True
- ☒ False ✔

The correct answer is 'False'.

Question **19**

Correct

Mark 1 out of 1

Dynamic Programming is a method to create and execute programs that can be modified run time

Select one:

- ☐ True
- ☒ False ✓

The correct answer is 'False'.

Question **20**

Correct

Mark 1 out of 1

Adjacency Matrix representation of a Graph is better when the Graphs are reasonably small

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Question **21**

Correct

Mark 1 out of 1

The sub-concept in an optimal substructure methodology that the cumulative weights of 2 paths connecting 3 vertices is always more than or equal to the 3 path involved is called

Select one:

- ☒ a. Triangular inequality ✓
- ☐ b. Subpath manipulation
- ☐ c. Brute-force concept
- ☐ d. Edge relaxation

Your answer is correct.

The correct answer is: Triangular inequality

Question **22**

Correct

Mark 1 out of 1

3 Valid Disjoin set operations that you an recollect. Pick all 3 to get full marks

Select one or more:

- ☒ a. MAKE-SET ✓
- ☒ b. FIND-SET ✓
- ☐ c. DEL-OBJECTS
- ☐ d. FIND-SUBSET
- ☒ e. UNION ✓

Your answer is correct.

The correct answers are: FIND-SET, MAKE-SET, UNION

Question **23**

Correct

Mark 1 out of 1

A DAG (Directed Acyclic Graph) is acyclic If and Only If a depth First Search of the Graph yields no back edges

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

Question **24**

Correct

Mark 1 out of 1

Pick all the right type of edge weight types

Tip: select ALL that are valid types

Select one or more:

- ☒ a. Real Weights ✓
- ☐ b. Imaginary Weights
- ☒ c. Negative Weights ✓
- ☒ d. Positive Weights ✓

Your answer is correct.

The correct answers are: Positive Weights, Negative Weights, Real Weights

Question **25**

Correct

Mark 1 out of 1

Negative weights are discouraged in Graphs because usage of those can lead to negative infinity issues

Select one:

- ☒ True ✓
- ☐ False

The correct answer is 'True'.

[◀ Lab assignment - 4](#)

[Lab assignment 5 ▶](#)