

Graph definitions and implementation



9/10 questions correct

Quiz passed!

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1.

Consider the following adjacency matrix representation of a directed graph (represented as code for nicer formatting):

```
1 0 0 1
0 1 0 1
0 0 1 0
0 1 1 1
```

How many edges are in this graph?

8

Well done!

Great! The sum of the entries in the matrix represents the number of edges in the graph.



2.

Consider the same adjacency matrix representation of a directed graph (represented as code for nicer formatting):

```
1 0 0 1
0 1 0 1
0 0 1 0
0 1 1 1
```

How many vertices in this graph have a self-loop, i.e. an edge that starts in a vertex and ends at the same vertex it started at?

4

Well done!

Great! The 1's on the diagonal represent edges that start in one vertex and go back to the same vertex.



3.

If you have a graph with 5 vertices and 2 edges, how many entries are there in the matrix with an adjacency matrix representation of this graph?

4

Sorry, that's not what we're looking for.

Review the lecture on the graph adjacency matrix representation if you need to. Remember you need one entry in the matrix for each *possible* edge in the graph.



4.

Consider the following adjacency list representation of a directed graph:

```
0 -> {}  
1 -> {2, 3}  
2 -> {1}  
3 -> {0, 2, 3}  
4 -> {0, 1, 3, 4}
```

How many edges does this graph have?

10

Well done!

Great! The numbers in the lists on the left represent the edges in the graph.



5.

Consider the following adjacency list representation of a directed graph:

```
0 -> {}  
1 -> {2, 3}  
2 -> {1}  
3 -> {0, 2, 3}  
4 -> {0, 1, 3, 4}
```

Which vertex in this graph has the highest *in*-degree?

3

Well done!

Great! 3 has three edges coming into it (from 4, 3, and 1).



6.

Consider the following adjacency list representation of a directed graph (note: this graph is slightly different from the graph in the previous two questions):

```
0 -> {}  
1 -> {2, 3}  
2 -> {1, 3}  
3 -> {0, 2, 3}  
4 -> {0, 1, 3, 4}
```

What is the degree sequence for this graph? Make sure you put a single space between each number in the sequence. There should be no commas or additional spaces in the sequence.

Hint: make sure you list the degrees in the correct order.

7 5 4 4 2

Well done!

Great! This is the correct answer.



7.

Consider the following adjacency list representation of a directed graph:

```
0 -> {}  
1 -> {2, 3}  
2 -> {1}  
3 -> {0, 2, 3}  
4 -> {0, 1, 3, 4}
```

Which of the following pairs of vertices have paths from the first vertex to the second. Select all that apply.

☐

From 1 to 0

Well done!

Review the lecture Core: Graph Definitions

Hint: remember that a path can have more than one hop.

☐ From 3 to 4

Well done!

Review the lecture Core: Graph Definitions

Hint: remember that a path can have more than one hop.

☐ From 4 to 0

Well done!

Review the lecture Core: Graph Definitions

Hint: remember that a path can have more than one hop.

☐ From 0 to 1

Well done!

Review the lecture Core: Graph Definitions

Hint: remember that a path can have more than one hop.

☐ From 1 to 4

Well done!

Review the lecture Core: Graph Definitions

Hint: remember that a path can have more than one hop.



8.

How many hours did you spend on the programming assignment this week?

☐ Less than 1

☐ 1-2

- ☐ 2-3
 - ☐ 3-4
 - ☐ 4-5
 - ☐ More than 5
-



9.

How difficult did you find the programming assignment?

- ☐ Very easy
 - ☐ Pretty easy
 - ☐ Neither easy nor difficult
 - ☐ Pretty difficult
 - ☐ Very difficult
-



10.

How much did you enjoy the programming assignment?

- ☐ I really enjoyed it!
 - ☐ I enjoyed it.
 - ☐ I'm neutral about my enjoyment
 - ☐ I did not enjoy it.
 - ☐ I really did not enjoy it!
-

