Graph definitions and implementation

10 вопросов

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

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

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?

25

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

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

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.

0 2 2 3 4

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.

- [x] From 0 to 1
- [x] From 1 to 4
- [ ] From 4 to 0
- [x] From 1 to 0
- [x] From 3 to 4

8.

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

- (o) 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!

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