Week 3 Quiz

TOTAL POINTS 10

1. Let G = (V,E) be a simple graph consisting of a set of vertices V and a set of (undirected) edges E where each edge is a set of two vertices. Which one of the following is not a simple graph? 1 point

   - G = (V = (a,b,c), E = ((a,b)))
   - G = (V = (a,b,c), E = ((a,b), (a,c), (b,a), (b,c), (a,c), (b,c)))
   - G = (V = (a,b,c), E = ())
   - G = (V = (a,b,c), E = ((a,b),(b,c),(a,c)))

2. For a simple graph with n vertices, what is the worst case (largest possible) for the number of edges? 1 point

   - O(n log n)
   - O(2^n)
   - O(n^2)
   - O(n)

3. Which graph representation has a better worst-case storage complexity than the others for storing a simple graph of n vertices? 1 point

   - Edge List
   - Adjacency Matrix
   - Adjacency List
   - All three graph representations have the same worst-space storage complexity for a simple graph of n nodes.

4. Suppose you have a rapid data feed that requires you to add new data point vertices quickly to a graph representation. Which graph representation would you NOT want to utilize? 1 point

   - Edge List
   - Adjacency Matrix
   - Adjacency List
   - All three graph representations have the same time complexity for adding vertices to a simple graph.

5. Suppose you have a rapid data feed that requires you to remove existing data point vertices (and any of their edges to other vertices) quickly to a graph representation. Which graph representation would you WANT to utilize? 1 point

   - Edge List
   - Adjacency Matrix
   - Adjacency List
   - All three representations have the same time complexity for removing a vertex from a simple graph of n vertices.

6. Suppose you want to implement a function called neighbors(v) that returns the list of vertices that share an edge with vertex v. Which representation would be the better choice for implementing this neighbors() function? 1 point

- Edge List
- Adjacency Matrix
- Adjacency List
- All three representations result in the same time complexity for the neighbor() function.

7. Suppose you want to implement a function called neighborsQ(v1,v2) that returns true only if vertices v1 and v2 share an edge. Which representation would be the better choice for implementing this neighborsQ() function? 1 point

- Edge List
- Adjacency Matrix
- Adjacency List
- All three representations support the same time complexity for implementing the neighborQ() function.

8. Which of these edge lists has a vertex of the highest degree? 1 point

- (a, c), (e, g), (c, e), (g, a)
- (a,b), (b, c), (d, b), (g, b)
- (d,b), (g,a), (h,f), (c, e)
- (a, b), (a, c), (a, d), (b, d)

9. Which adjacency matrix corresponds to the edge list: (1,2), (2,3), (3,4), (1,4) (where the rows/columns of the adjacency matrix follow the same order as the vertex indices)? 1 point

0	0	1	1
	0	1	1
		0	0
			0

1	0	0	1
	1	0	0
		1	0
			1

0	1	1	0
	0	1	1
		0	1
			0

0	1	0	1
	0	1	0
		0	1
			0

10. Which graph representation would be the best choice for implementing a procedure that only needs to build a graph from a stream of events. 1 point

- Edge List
- Adjacency Matrix
- Adjacency List
- All three representations would share the same storage and time complexity for the procedure.

I, **Jiarong Yang**, understand that submitting work that isn't my own may result in permanent failure of this course or deactivation of my Coursera account.

Learn more about Coursera's Honor Code

Save Submit