Undirected Graphs

Back to Week 1

3/3 points earned (100%)

Quiz passed!

1 / 1 points

1.

```
(seed = 489125)
Consider the adjacency-lists representation of a graph with 8 vertices and 9
    edges:

    A:  E B F
    B:  A C
    C:  G B H F D
    D:  H C
    E:  A
    F:  C A
    G:  C
    H:  D C


Here is a graphical representation of the same graph:

    (A)-------------(B)-------------(C)-------------(D)
     |\                             /|\             |
     | \                           / | \            |
     |  \                         /  |  \           |
     |   \                       /   |   \          |
     |    \                     /    |    \         |
     |     \                   /     |     \        |
     |      \                 /      |      \       |
     |       \               /       |       \      |
     |        \             /        |        \     |
     |         \           /         |         \    |
     |          \         /          |          \   |
     |           \       /           |           \  |
     |            \     /            |            \ |
     |             \   /             |             \|
     |              \ /              |              |
    (E)             (F)             (G)             (H)


```

Run depth-first search (using the adjacency-lists representation) from vertex A. Give the sequence in which depth-first search discovers (marks) the vertices. This is known as the preorder.

Your answer should be a sequence of 8 uppercase letters, with each letter separated by whitespace.

1 / 1
points

2.

```
(seed = 50828)
Consider the adjacency-lists representation of a graph with 8 vertices and 10
    edges:

    A:  B E
    B:  C F E A G
    C:  B D
    D:  C H G
    E:  B A
    F:  B G
    G:  F D B
    H:  D


Here is a graphical representation of the same graph:

    (A)-------------(B)-------------(C)-------------(D)
     |             /|\                            /|
     |            / | \                          / |
     |           /  |  \                        /  |
     |          /   |   \                      /   |
     |         /    |    \                    /    |
     |        /     |     \                  /     |
     |       /      |      \                /      |
     |      /       |       \              /       |
     |     /        |        \            /        |
     |    /         |         \          /         |
     |   /          |          \        /          |
     |  /           |           \      /           |
     | /            |            \    /            |
     |/             |             \  /             |
    (E)            (F)-------------(G)            (H)

```

Run breadth-first search (using the adjacency-lists representation) from vertex A. Give the sequence in which the vertices are dequeued from the FIFO queue.

Your answer should be a sequence of uppercase letters (starting with A) separated by whitespace.

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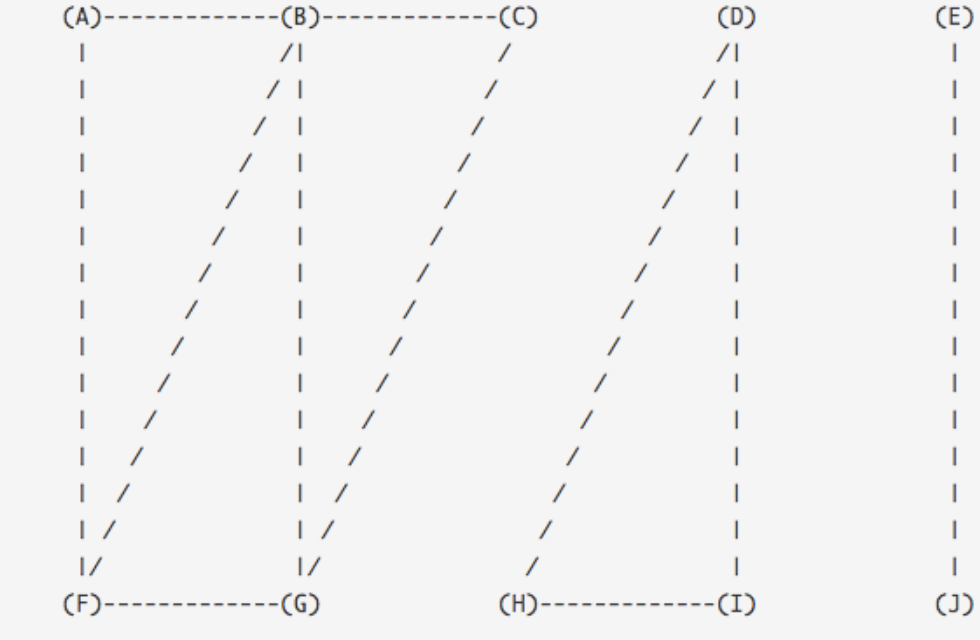
1 / 1
points

3.

```
(seed = 68492)
Consider the adjacency-lists representation of a graph with 10 vertices and
    11 edges:

    A:  F B
    B:  C G A F
    C:  B G
    D:  H I
    E:  J
    F:  A G B
    G:  C B F
    H:  D I
    I:  D H
    J:  E
```

Here is a graphical representation of the same graph:




```
      v   A  B  C  D  E  F  G  H  I  J
   -----------------------------------
   id[v]
```

Compute the connected components of the graph using the depth-first search algorithm (and start numbering connected component ids with 0). Give the sequence of the 10 integers in the id[] array (shown above) for the vertices A through J.