1. What is the big-Oh space complexity of an adjacency list? Justify your answer.

Because we only need to store the information about the vertexes and all the existing edges, the space complexity of an adjacency list is O(E+V) where E is the number of edges and V is the number of vertexes.

2. What is the big-Oh space complexity of an adjacency matrix? Justify your answer.

Because we need to store the information on the relationships between all the pairs of nodes, even though some of the nodes are not related, the time complexity is O(V^2)

3. What is the big-Oh time complexity for searching an entire graph using *depth-first search* (DFS)? Does the representation of the graph make a difference? Justify your answer.

The complexity of DFS for the adjacency list is O(V+E) because we traverse the adjacency list for every node then we finish DFS.

The complexity of DFS for the matrix is O(V^2), as each position in the matrix is visited once and there are V^2 positions.

4. What is the big-Oh time complexity for searching an entire graph using *breadth-first search* (BFS)? Does the representation of the graph make a difference? Justify your answer.

The answer is the same as question 3 because we still need to traverse all the related nodes or positions for the adjacency list or matrix. The complexity of DFS for the adjacency list is O(V+E), and the complexity of DFS for the matrix is O(V^2).