Hichem Belhocine 18-206-722

Solution_01

Task 1

1. Compute the time complexity of finding whether two URLs are connected or not, for adjacency matrix, adjacency list and edge list:

• Adjacency Matrix: The presence of an edge can be checked O(1), directly access this information, given that you know the indexes of your vertices.

• Adjacency List: The time complexity would be O(|V|), a vertex can be connected to at most O(|V|) vertices.

• Edge List: The list should be searched for the particular edge, so the worst case we have to search in the whole list of edges, ==> Time complexity is O(|E|).

2. What is the most time efficient graph representation to find the number of links for a particular URL in the network:
Adjacency list is the most time efficient representation to find the number of links for a particular URL in the network.

3. Explain how to use the adjacency matrix representation to find out if the graph is directed or undirected:
Matrix is symmetric: adjacency matrix[A, B] must be the same as adjacency matrix[B, A] ===> the network is undirected. Example: Facebook
Directed network ===> is not symmetric. Example: Twitter