

Birla Institute of Technology and Science-Pilani, Hyderabad Campus
First Semester 2020-2021
Lab Sheet-10
CS G526: Advanced Algorithms and Complexity
Date: 30/12/20

General Instructions: Argue logically. Write it in a manner that explains your logic very clearly. Do not miss steps in between.

Problem-1: [60 pts] Implement Union-Find Data Structure with union-by-rank.

Problem-2: [40 pts] Implement incremental connectivity algorithm from the class. The input to your program will be intermixed of edge insertion and query. The structure of the input file will be the following:

I: a,b
Q: c,d

Where “I” denotes the insertion and “Q” denotes the query. First line indicates it is an insertion of an edge (a, b) and the second line indicates a query that asks if the two vertices “c” and “d” are connected. Your program should return “Yes” if connected and “no” if not connected. For each query, write your output to the file in the format:

Q: c, d: Yes
Q: x, y: No.