CSE 208 (Data Structures and Algorithms II Sessional)

Offline Assignment 4

Submission deadline: Week 6

Section A1, A2, B2:

You have to implement the **Kruskal's** minimum spanning tree algorithm for an undirected weighted graph $G = (V, E)$ as the fourth offline assignment of CSE 208. Please consider the following requirements:

1) Implement necessary code for graph representation without using standard template libraries.
2) Make sure the running time of the algorithm is **O (E lg V)**.
3) Use file operations for input and output.
4) You may need to use your implementation for the online assignment. So make sure your code is well-organized so you can use it for solving other problems.

Sample Input	Sample Output
10 16 0 1 4 0 7 8 1 7 10 1 2 8 2 3 7 2 8 2 2 5 3 5 6 2 6 7 1 8 6 6 3 5 15 3 4 10 4 5 10 7 8 8 9 7 2 9 5 1	Added edges: **[edges can vary]** (6, 7) (9, 5) (2, 8) (5, 6) (2, 5) (0, 1) (2, 3) (0, 7) (3, 4) MST weight: 38

Section B1:

You have to implement the **Prim's** minimum spanning tree algorithm for an undirected weighted graph $G = (V, E)$ as the fourth offline assignment of CSE 208. Please consider the following requirements:

1) Implement necessary code for graph representation without using standard template libraries.
2) Make sure the running time of the algorithm is $\mathbf{O}(V \lg V)$.
3) Use file operations for input and output.
4) You may need to use your implementation for the online assignment. So make sure your code is well-organized so you can use it for solving other problems.

Sample Input	Sample Output
10 16 0 1 4 0 7 8 1 7 10 1 2 8 2 3 7 2 8 2 2 5 3 5 6 2 6 7 1 8 6 6 3 5 15 3 4 10 4 5 10 7 8 8 9 7 2 9 5 1	Added edges: **[edges can vary]** (0, 1) (1, 2) (2, 8) (2, 5) (9, 5) (5, 6) (6, 7) (2, 3) (5, 4) MST weight: 38