CS2233 Assignment Report

CS18BTECH11042

Details of libraries used and I/O for each question.

PS. Please check the individual C++ programs for detailed comments on each aspect including I/O format of the program.

Q1

- **Libraries Used**:
    - iostream and sstream for I/O functionalities
    - string.h for string usage

- **Sample Input**: (Please refer program comments for I/O format details)
  SSSKKBBBBHHHJJJJKKKK
  Print
  Store
  Print
  Ascend/Sort
  Remove 3
  Print
  Ascend

- **Sample Output**:
  Please Store First
  S K
  S 3 K 6 B 4 H 3 J 4
  KBJSH
  SSSKKBBBHHHJJJKKK
  S 3 K 5 B 3 H 3 J 3
  KSBHJ

Q2

- **Libraries Used**:
    - iostream and sstream for I/O functionalities
    - string.h for string usage

- **Sample Input**: (Please refer program comments for I/O format details)
  25 20 36 10 22 30 40 5 12 28 38 48 1 8 15 45 50
  M 10
  M 40
  M 12
  P 10
  P 38
  S 10
  S 36
  C 38 50
  C 25 38

- **Sample Output**:
  1 15
  38 50
  12 15
  8
  36
  12
  38
  40
  25

Note: For Q3, Q4, Q5 please enter number of vertices first

Q3

- **Libraries Used**:
  - iostream and sstream for I/O functionalities
  - string.h for string usage

- **Sample Input**: (Please refer program comments for I/O format details)
  17
  E 0 2 5
  E 0 1 11
  E 2 1 3
  E 2 3 7
  E 1 4 1
  E 4 3 2

E 4 5 7
E 3 5 3
E 6 7 7
E 6 8 11
E 7 8 5
E 7 9 5
E 8 9 3
E 8 10 5
E 16 11 5
E 16 14 3
E 11 12 11
E 11 15 7
E 12 13 5
n 4
N 2
V 18
V 12
W 3 4
W 4 3
c 2 4
C 2 3
r
Y

- **Sample Output**:
  3 5 1
  1 3 0
  NO
  YES
  No edge exists
  2
  NO
  YES
  0 1 2 3 4 5 6 7 8 9 10 11 12 13 14 15 16
  Wrong Input Format

Q4

- **Libraries Used**:
  - iostream and sstream for I/O functionalities

    - string.h for string usage
    - vector for storing all the adjacency lists
    - queue for implementation of shortest path algorithm
    - limits.h for initializing the distances to INFINITY(INT_MAX)

- **Sample Input**: (Please refer program comments for I/O format details)
  17
  E 0 2 5
  E 0 1 11
  E 2 1 3
  E 2 3 7
  E 1 4 1
  E 4 3 2
  E 4 5 7
  E 3 5 3
  E 6 7 7
  E 6 8 11
  E 7 8 5
  E 7 9 5
  E 8 9 3
  E 8 10 5
  E 16 11 5
  E 16 14 3
  E 11 12 11
  E 11 15 7
  E 12 13 5
  Find
  SP 0
  SP 5
  sp 2

- **Sample Output**:
  3 component(s)
  0 2 1 4 3 5
  6 7 8 9 10
  11 16 14 12 13 15
  0 0 0
  0 1 8
  0 2 5
  0 3 11
  0 4 9
  0 5 14

5 5 0
2 1 3
2 2 0
2 3 6
2 4 4
2 5 9

Q5

- **Libraries Used**:
  - iostream and sstream for I/O functionalities
  - string.h for string usage
  - vector for storing all the adjacency lists

- **Sample Input**: (Please refer program comments for I/O format details)
  - Input 1:
    17
    E 0 2 5
    E 0 1 11
    E 2 1 3
    E 2 3 7
    E 1 4 1
    E 4 3 2
    E 4 5 7
    E 3 5 3
    E 6 7 7
    E 6 8 11
    E 7 8 5
    E 7 9 5
    E 8 9 3
    E 8 10 5
    E 16 11 5
    E 16 14 3
    E 11 12 11
    E 11 15 7
    E 12 13 5

  - Input 2:
    5
    E 0 1 3
    E 2 4 7

E 2 3 1
E 1 4 2
E 1 3 2
E 0 4 9
E 2 1 12

- **Sample Output**:
  - Output 1:
    No MST exists

  - Output 2:
    (2,3) (1,4) (1,3) (0,1)