PE424001 Algorithm and Data Structure
Assignment 2
(25% of the module score)

1. (10 Marks) Run Dijkstras algorithm on the weighted graph below (Figure 1), using vertex A as the source. Write the vertices in the order which they are marked and compute all distances at each step

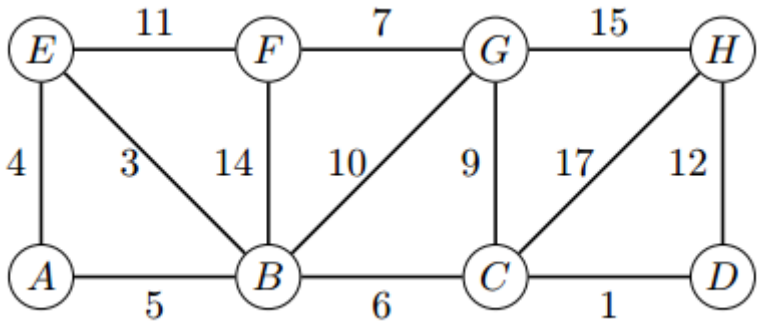

Figure 1

2. (7 Marks) Write down the total cost of the following code segments:

A) (2 Marks)

```
a=b;
for(i=0;i<n;i++)
 x= x+2
```

B) (4 Marks)

```
a=b;
z=2;
for(i=0;i<n;i++)
{
 x= x+2
 for(j=0;j<n;j++)
        y=y+1
}
```

C) (1 Mark, 0.5 each) Indicate the running time of each algorithm below:

i)

```
for(i=1;i < n;i++)
    for(j=n-i;j < n ;j++)
        count++;
```

ii)

Executing the Binary Search on an array containing V elements;

3. (8 Marks)

A) (4 Marks) Give an adjacency list representation for a complete binary tree on 7 vertices (see Figure 2). Show an equivalent adjacency matrix and list representation.

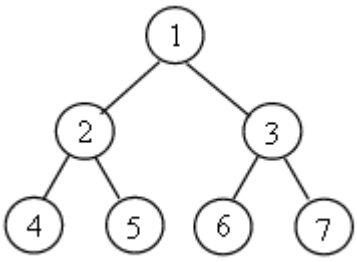

Figure 2

B) (4 Marks) Use proper data structure to show the BFS/DFS final path of the following graph (see Figure 3) starts from node 'u'.

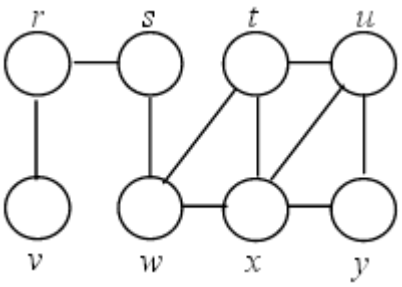

Figure 3

Submission

- **DEADLINE: 22:00:00 10th August 2021**

- **Submission method:**

1. Zip up all the files and name the zip file to **"[Last name]_[First name].zip".** (E.g. Chan_Peter.zip)
2. Send the zip file to alexng88@vtc.edu.hk
3. Enter "ADS Assignment 2 Submission – [Last name] [First name]" in the subject.
4. Marks will be deducted if you don't follow the submission method.

Marks will be deducted on late submission.

1 week	Your marks x 90%
2 weeks	Your marks x 80%
More than 2 weeks	Your marks x 0%

Marking Scheme

This assignment contributes 25% of the final grade of PE424001
The full mark for this assignment is 25 marks, which break down into:

- Question 1 contributes 10 marks.
- Question 2 contributes 7 marks.
- Question 3 contributes 8 marks.

- End -