

# HW07 for ECE 9343

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## 1 Question 1: Huffman Code Running

## 2 Question 2: CLRS Problem Set 16.1

## 3 Question 3: CLRS Exercise 24.3-6

Consider the modification of Dijkstra's algorithm, growing the reliable tree from one root:

INITIALIZE( $G, root$ )

```
1 for each  $v \in G.V$ 
2    $v.d = 0$ 
3    $v.\pi = nullptr$ 
4  $root.d = 1$ 
```

RELAX( $u, v, r$ )

```
1 if  $u.d < v.d * r(u, v)$ 
2    $u.d \leftarrow v.d * r(u, v)$ 
3    $v.\pi \leftarrow u$ 
```

RELIABLE-PATH-SEARCH( $G, root$ )

```
1 INITIALIZE( $G, root$ )
2  $Q \leftarrow G.V$ 
3 while  $!Q.empty$ 
4    $u = \text{EXTRACT-MAX}(Q)$ 
5   for each  $v \in G.E(u)$ 
6     RELAX( $u, v, G.r$ )
```

```

PRINT-PATH( $G, root, v$ )
1  if  $v = root$ 
2      return
3  else
4      if  $v.\pi = nullptr$ 
5          PRINT(NO SUCH PATH)
6      else
7          PRINT-PATH( $G, r, v.\pi$ )
8          PRINT( $v$ )

```

#### 4 Question 2: CLRS Problem Set 16.1