

**T.A. Help Session: Union Find**

**1. a. Show the resulting up Up-Tree data structure after the following unions:**

union(1,5), union(3,7), union(5,6), union(1,4), union(6,2), union(5,3)

**b. Fill in the resulting up-tree array implementation with**

	1	2	3	4	5	6	7
up							
weight							

**What is the worst-case runtime of a union operation? \_\_\_\_\_**

**find operation? \_\_\_\_\_**

**c. Now show the resulting up-tree data structure after the following finds, utilizing path compression:**

find(7)

find(2)

## 2. Pseudocode

**a. Write pseudocode for a basic union operation:**

```
int[] up;  
public void union(int x, int y)
```

**b. Write pseudocode for a union-by-weight operation:**

```
int[] up;  
int[] weight;  
public void unionByWeight(int x, int y)
```

**c. Write pseudocode for a basic find operation:**

```
int[] up;  
public int find(int x)
```

**d. Write pseudocode for a find operation, implementing path compression:**

```
int[] up;  
public int findWithPathCompression(int x)
```