

CSE 202 Midterm 3

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I. QUESTION (PRIORITY QUEUE) (20 POINTS)

Write a method to find the k 'th largest element of an integer array (Hint: Use a priority queue).

```
int kthlargest(int[] A)
```

II. QUESTION (PRIORITY QUEUE) (15 POINTS)

Write a method which returns the largest child of a priority node given its index.

```
Node largestChild(int index)
```

III. QUESTION (DISJOINT SET) (15 POINTS)

Write a method which finds the depth of a node given its index.

```
int depth(int index)
```

IV. QUESTION (DISJOINT SET) (15 POINTS)

Write a method which returns the number of disjoint sets in a disjoint set data structure.

```
int numberOfSets()
```

V. QUESTION (GRAPH) (20 POINTS)

Write a method to find the out-degree of a node given its index. You should write the code for both adjacency matrix and adjacency list representation.

```
int outdegree(int index)
```

VI. QUESTION (GRAPH) (15 POINTS)

Write a method which returns true if the graph is undirected, false otherwise. Solve the problem for adjacency matrix representation.

```
boolean isUndirected()
```