

## CS 314 FINAL REVIEW — MAXIMUM IN-DEGREE

### Graphs

Write an instance method for the provided `Graph` class which finds the maximum in-degree out of all the vertices in the graph. The in-degree of a vertex is the number of edges which are directed into it.

The graph for this problem is directed and stored using adjacency lists.

Complete the following instance method.

```
// Finds the maximum in-degree in the graph
// pre: vertices.size() > 0
// post: the structure of the graph is not altered by this operation
public int maxInDegree() {
```

Use the following `Graph` implementation.

```
public class Graph {
    // The vertices in the graph.
    private Map<String, Vertex> vertices;

    // Sets scratch to 0 for all vertices
    private void clearAll(){ /* ... */ }

    private static class Vertex {
        private String name;
        private List<Edge> adjacent;
        private int scratch;
    }

    private static class Edge {
        private Vertex dest;
    }
}
```

**You may not create any new data structures.  
Do not use any other Java classes or methods.**

```

// Finds the maximum in-degree in the graph
// pre: vertices.size() > 0
// post: the structure of the graph is not altered by this operation
public int maxInDegree() {
    clearAll();
    for(Vertex v : vertices.values()){
        for(Edge e : v.adjacent){
            Vertex neighbor = e.dest;
            neighbor.scratch++;
        }
    }

    int max = 0;
    for(Vertex v : vertices.values())
        if(v.scratch > max)
            max = v.scratch;
}

```