

CSC 345
Sample Final Exam Questions
Fall 2014

In Lab 5, problem 30.1, we had the following code that would read a data file and create an Unweighted graph:

```
Scanner input = new Scanner(System.in);
System.out.print("Enter the filename that contains the graph: ");
String filename = input.next();
ArrayList<AbstractGraph.Edge> list = new ArrayList<AbstractGraph.Edge>();
Scanner infile = new Scanner( new File( filename ) );
int n = Integer.parseInt(infile.nextLine());
for(int i = 0; i < n; i++)
{
    String[] line = infile.nextLine().split("[\\s+]");
    int u = Integer.parseInt(line[0]);
    for( int j = 1; j < line.length; j++)
    {
        int v = Integer.parseInt( line[j] );
        list.add( new AbstractGraph.Edge(u, v) );
    }
}
UnweightedGraph<Integer> g = new UnweightedGraph<Integer>( list, n );
```

Given data file, draw the graph.

Give the adjacency matrix for this graph.

Draw a depth first search tree starting at a given vertex.

Draw a breadth first search tree starting at a given vertex.

Find the shortest path (fewest edges) between two given vertices.

Find a Hamiltonian path starting at a given vertex, if one exists.

In Lab 7, problem 31.9, we had the following code that would read a data file and create a Weighted graph:

```
Scanner input = new Scanner(System.in);
System.out.print("Enter name of file to read: ");
String filename = input.nextLine();
Scanner infile = new Scanner( new File( filename ) );
int n = Integer.parseInt( infile.nextLine() );
ArrayList list = new ArrayList<WeightedEdge>();
while( infile.hasNext() )
{
    int u = infile.nextInt();
    int v = infile.nextInt();
    double w = infile.nextDouble();
    list.add( new WeightedEdge( u, v, w ) );
    list.add( new WeightedEdge( v, u, w ) );
}
WeightedGraph g = new WeightedGraph( list, n );
```

Given a data file, draw the weighted graph.

Draw a Minimal Spanning Tree for this weighted graph.

Find the shortest path (least total weight) between two given vertices.

You might also get a problem similar to a Programming Contest problem (as easy as I can find!)