Math 376: Graph Theory
Algorithms Handout

Outline an algorithm to solve the following problems, and determine the running time of your algorithm. You do not need to find the fastest algorithm to solve the problem.

1. Input a simple graph G, and output whether G is complete.
2. Input a simple graph G, and output the minimum degree of G.
3. Input a simple graph G, and output whether G is regular (every vertex has the same degree).
4. Input two simple graphs G and H, and output whether G and H are isomorphic.
5. Input a simple graph G, and output whether G is bipartite.
6. Input a simple graph G, and output whether G is connected.
7. Input a simple graph G, and output the size of the largest independent set in G.
8. Input a simple connected graph G and two vertices v and w in G, and output a path from v to w.
9. Input a simple connected graph G and two vertices v and w in G, and output the distance between v and w (the length of the shortest path between them).
10. Input a simple connected graph G, and output the diameter of G (the largest distance between any two vertices in G).
11. Input a simple graph G, and output whether G is Eulerian.
12. Input a simple graph G, output whether G is Hamiltonian.