CSCI 2270
Review for final exam. All 3 previous review sheets are also important.

Given the graph with vertices A, B, C, D, E, and F, and the following edges:

A: F, B
B: A, C
C: B, D
D: C, E
E: D, F
F: E, A

1. Draw the graph as vertices and edges.

2. In a depth first search of the above graph, what vertices will it pop off the stack in a search starting at A and ending at F?

3. In a breadth first search of the above graph, what vertices will it pop off the queue in a search starting at C and ending at D?

4. What's better about breadth first search than depth first search?

5. Which takes longer, breadth first or depth first search?

6. Given a hash table of size 17 (this tells you the hash function to use) that uses open addressing plus a search for the next open slot, add the pairs:

138, "Frodo"

241, "Pippin"

070, "Merry"

104, "Tom Bombadil"

106, "Dick Cheney"

Draw the final table when you are done.

What problem is getting worse here?

How would your answer change if you used double hashing with a second hash function of modulo 5?

How would your answer change if you used chained hashing?

7. Explain, in simple English, how a buffer overrun hack works.

8. What is the difference between a deep copy and a shallow copy? How can you write a test to tell which one you have? How do pointers and shallow copies relate to each other?

9. How can you tell if 2 heaps in array form have all of the same elements?

10. Why do big_numbers benefit from a trim() function? When is such a function useful in HW2?

11. If we didn't write big_number's operator =, but we used the default version that C++ gives us instead, will we leak memory?

12. Give me an example of the scenario in question 11 causing a crash at runtime.

13. Why do we have the rule that heaps must be complete trees?

14. Given the array 1 4 6 8 3 2 7 5 9 0, show me how quicksort could degrade to quadratic performance in the first 3 partition steps.

15. Given a load factor of 25%, what is the general performance (in terms of expected slots checked) of a doubly-hashed hash table?

16. When can a load factor exceed 100%? Why does this happen?