CSE332 Week 2 Section Worksheet

1. Find values for c and n_0 (according to the definition of O( )) for f(n) is O(g(n)), where
   a.
      $f(n)=7n^2+3n$
      $g(n)=n^4$
   b.
      $f(n)=n+2n\log n$
      $g(n)=n\log n$
   c.
      $f(n)=1000$
      $g(n)=3n^3$
   d.
      $f(n)=7n$
      $g(n)=n/10$

2. True or false?
   a. f(n) is $\Theta(g(n))$ implies f(n) is O(g(n))

   b. f(n) is $\Theta(g(n))$ implies g(n) is $\Theta(f(n))$

   c. f(n) is $\Omega(g(n))$ implies f(n) is O(g(n))

3. Find functions f(n) and g(n) such that f(n) is O(g(n)) and the constant c for the definition of O( ) must be >1. That is, find f & g such that c must be greater than 1, as there is no sufficient n_0 when c=1.

4. Write the O( ) run-time of the functions with the following recurrence relations
   a. T(n)=3+T(n-1), where T(0)=1

   b. T(n)=3+T(n/2) , where T(1)=1

   c. T(n)=3+T(n-1)+T(n-1) , where T(0)=1

5. What's the O( ) run-time of this code fragment in terms of n:

```
int x=0;
for(int i=n;i>=0;i--)
     if((i%3)==0) break;
     else x+=i;
```