CS 561, HW2

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Please use no outside references in solving these problems.

1. Consider the recurrence $T(n) = 3T(n/4) + \log^2 n$
   
   (a) Use the Master method to get a general solution to this recurrence.
   
   (b) Now use annihilators (and a transformation) to get a tight upper bound on the solution to this recurrence. Show your work. (Note that your two bounds should match)

2. Consider the following function:

   ```
   int f (int n){
      if (n==0) return 3;
      else if (n==1) return 5;
      else{
         int val = 3*f (n-1);
         val = val - 2*f (n-2);
         return val;
      }
   }
   ```

   (a) Write a recurrence relation for the value returned by $f$. Solve the recurrence exactly. (Don’t forget to check it)

   (b) Write a recurrence relation for the running time of $f$. Get a tight upperbound (i.e. big-O) on the solution to this recurrence.

3. Exercise 6.1-4

4. Exercise 6.1-5
5. Exercise 6.4-2
6. Exercise 6.5-5
7. Problem 6-3
8. Exercise 7.1-3
9. Problem 7-1
10. Problem 7-2
11. Problem 7-3