CS 206 Data Structures Spring 2015

Homework 3

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1. Write concise pseudocode or program code that gives the approximate number of digits in a positive integer. The integer is written in base 10.

2. Why is the order of an algorithm generally more important than the speed of the processor?

3. Convert each time formula to the best possible big-O notation. Do not include any spurious constants in your big-O answer.

Time Formula	Big-O
10n	.
$2n^2$	.
3 times log (base 2) of n	.
$2n^2 + 10n$	.

5. What will be the big-O expression for 1+2+3+...+n?

6. What formula in big-O notation will represent the expression $n^2+35n+6$?

7. Here is some code for an *integer* variable n:

```
while (n > 0)
{
   n = n/10; // Use integer division
}
```

What is the worst-case time analysis for the above loop?

8. Express the formula (n - 2)*(n - 4) using the big-O notation.

9. Write a recursive function that prints out the sequence of moves needed to accomplish the task of the Towers of Hanoi problem discussed in class.