Fundamentals of Algorithms Fall 2012 Homework 2 Due: Tuesday September 4 at 10 AM

1. (a) Implement Bubble sort in your favorite programming language

(b) Implement Merge sort in your favorite programming language

(c) Use both programs to sort a reversed list of integers of lengths 10,000, 50,000 and 100,000

And fill in the following table

|  |  |  |
| --- | --- | --- |
| Length of list | Bubble sort running time (ms) | Merge sort running time(ms) |
| 10,000 |  |  |
| 50,000 |  |  |
| 100,000 |  |  |

Please show your source code

1. What are some advantages of the Big-OH notation?
2. It gives the exact number of operations that an algorithm takes
3. It shows the constant factors
4. It shows how the computation time will grow as the input size grows
5. It is different on each type of machine

Solve the following recurrences AND use proof by induction to VERIFY your solution

1. T(n)= T(n-1) + 2, T(1)=1
2. T(n) = 3\*T(n-1), T(1)=1
3. T(n) = T(n-1) + n, T(1)=1