Homework_2 - Notepad

File Edit Format View Help

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Homework_2

1)

```
void swapNodes(){
        Node *p = B;
        Node *tmp = B->next; //store B

        B->next = B->next->next; //point to C
        tmp->next = D->next; //move C to after D
        D->next = tmp; //make D point to C
}
```

2)

I)

```
unsigned int f1(unsigned int m, unsigned int n){
        unsigned int s = 0;                             //c1    1
        for(unsigned int i = 0;                         //c2    1
                i < 2 * m;                              //c3    2m + 1
                i++)                                    //c4    2m
                for(unsigned int j = n;                 //c5    2m
                        j > 0;                          //c6    2m(n + 1)
                        j--)                            //c7    2m(n)
                        s += i * j;                     //c8    2m(n)
        return s;                                       //c9    1
}
```

a) T(m, n) = c1 * 1 + c2 * 1 + c3 * 2m+2 + c4 * 2m + c5 * 2m + c6 * 2m(n+1) + c7 * 2m(n) + c8 * 2m(n) + c9 * 1
b) O(m,n) = O(m*n)

II)

```
unsigned int f2(unsigned int n){
        unsigned i = 1;                                 //c1    1
        for(unsigned int j = 1;                         //c2    1
                j <= n;                                 //c3    n + 1
                j++)                                    //c4    n
                for(unsigned int k = 1;                 //c5    n
                        k <= n;                         //c6    (n+1) * log(n)
                        k *= 2;                         //c7    nlog(n)
                        i = i * j;                      //c8    nlog(n)
        return i;                                       //c9    1
```

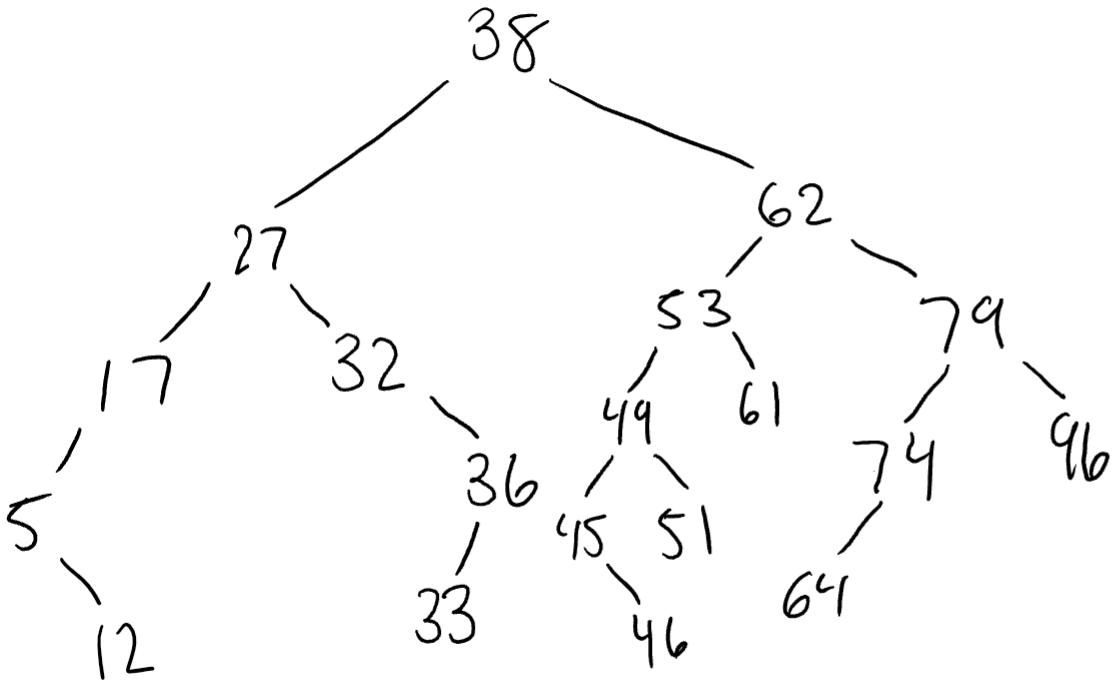
a) T(n) = c1 * 1 + c2 * 1 +c3 * n+1 + c4 * n + c5 * 1 + c6 * n(n+1) + c7 * n(log(n)) + c8 * n(log(n)) + c9 * 1
b) O(n) = O(nlog(n))

3) An algorithm takes 0.5 ms for input size 100. How long will it take for input size 500 if the running time is the following (assume low-order terms are negligible)?

a) linear -> (100/0.5ms) = (500/x)
   x = 2.5ms
b) O(NlogN) -> 100*log(100)/0.5ms = 500*log(500)/x
   x = 3.37ms
c) quadratic -> 100^2/0.5ms = 500^2/x
   x = 12.5ms
d) cubic -> 100^3/0.5ms = 500^3/x
   x = 62.5ms

4) On seperate PNG

Before



Final