

TIME COMPLEXITY QUESTIONS

Question: Find the Time Complexity of the following:

a)

```
a int i, j, k = 0;
b for (i = n / 2; i <= n; i++) {
    for (j = 2; j <= n; j = j * 2) {
        k = k + n / 2;
    }
}</pre>
```

- A. O(n)
- B. O(N log N)
- C. O(n^2)
- D. O(n^2Logn)

APNA

b)

```
for(int i=0;i<n;i++)
i*=k
```

Here, k is some constant value

- A. O(n)
- B. O(k)
- C. O(logkn) (= logn of base k)
- D. O(lognk) (= logk of base n)

c)

Algorithm A and B have a worst-case running time of O(n) and O(logn), respectively. Therefore, algorithm B always runs faster than algorithm A.

- A. True
- B. False
- d) Find the time & space complexity of floorSqrt function in the following code to calculate square root of a number :

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```
class SqrtNum {
    static int floorSqrt(int x)
    {
        if (x == 0 || x == 1)
            return x;
        int i = 1, result = 1;

        while (result <= x) {
            i++;
            result = i * i;
        }
        return i - 1;
    }

    public static void main(String[] args)
    {
        int x = 11;
        System.out.print(floorSqrt(x));
    }
}</pre>
```

e) Find the time & space complexity of the following code:

```
int a = 0;
for (int i = 0; i < n; ++i) {
   for (int j = n; j > i; --j) {
      a = a + i + j;
   }
}
```