

Design and Analysis of Algorithms

Assignment-1

1. What do you understand by Asymptotic notations. Define different Asymptotic notation with examples.
2. What should be time complexity of – `for(i=1 to n){ i=i*2;}`
3. $T(n) = \{3T(n-1) \text{ if } n>0, \text{ otherwise } 1\}$
4. $T(n) = \{2T(n-1)-1 \text{ if } n>0, \text{ otherwise } 1\}$
5. What should be time complexity of -

```
int i=1, s=1;
while(s<=n){
    i++;
    s=s+i;
    printf("#");
}
```

6. Time complexity of -

```
void function(int n){
    int i, count=0;
    for(i=1; i*i<=n; i++)
        count++
}
```

7. Time complexity of -

```
void function(int n){
    int i, j, k, count=0;
    for(i=n/2; i<=n; i++)
        for(j=1; j<=n; j=j*2)
            for(k=1; k<=n; k=k*2)
                count++
}
```

8. Time complexity of -

```
function(int n){
    if(n==1) return;
    for(i=1 to n){
```

```

        for(j=1 to n){
            printf("*");
        }
    }
function(n-3);
}

```

9. Time complexity of -

```

void function(int n){
    for(i=1 to n){
        for(j=1; j<=n; j=j+i)
            printf("*")
        }
    }
}

```

10. For the functions, n^k and c^n , what is the asymptotic relationship between these functions?

Assume that $k \geq 1$ and $c > 1$ are constants. Find out the value of c and n_0 for which relation holds.