**Time Complexity**

**##Worst case consider korte hbe…..**

Write the time complexity of each of the code segments shown below.

**1. int k=1;**

**while(k<=n){**

**cout<<k<<endl;**

**k=k\*2;**

**}**

Answer:

Time Complexity: O(n)

Space Complexity: O(1)

**2. for (int i = 0; i < n; i++)**

**for (int j = i; j > 0; j--)**

**cout << i << j;**

Answer:

Time Complexity: O(n^2)

Space Complexity: O(1)

I=0 , j=0, ---🡪0

I=1, j=1; ----🡪1

I=2,j=2;-----🡪2

………..

I=n, j=n;-----🡪n\*n-🡪n^2

**3. for (int i = 0; i < n; i++)**

**for (int j = i; j > 0; j--)**

**for(int k=j; k > 0; k--)**

**cout << i << j << k;**

Answer:

Time Complexity: O(n^3)

Space Complexity: O(1)

I=0 , j=0, k=0---🡪0

I=1, j=1; k=1----🡪1

I=2,j=2;k=2-----🡪2

………..

I=n, j=n;k=n-----🡪n\*n\*n -🡪n^3

**4. for(int i=n/2;i<=n;i++){ n ber er jnne vitor er loop ta logn ber**

**Ghurbe….. jmn… 8 er jnne vitor er loop**

**ta 3 ber ghurbe… 8=log2^3=3**

**for(int j=1;j<=n;j=j\*2){**

**cout<<i<<j<<endl;**

**}**

**}**

Answer:

Time Complexity: O( (n/2) \*logn) = O(nlogn)

Space Complexity: O(1)

I=5 , j=1, ---🡪6

I=6, j=1; ----🡪6

I=7,j=1;-----🡪6

**5. for(int i=n/2;i<=n;i++){------n/2**

**for(int j=1;j<=n;j=j+i){--------n**

**cout<<i<<j<<endl;**

**}**

**}**

Answer:

Time Complexity: O( (n/2) \*n) = O(n^2)

Space Complexity: O(1)

I=5 , j=1, ---🡪1

I=6, j=1; ----🡪1

I=7,j=1;-----🡪1

**6. for(int i=1;i<=n;i++)**

**{**

**if(builtin\_popcount(i) == 1)**

**{**

**for(int j=1;j<=n;j++)**

**cout<<i<<j<<endl;**

**}**

**}**

Answer:

Time Complexity: O(n^2)

Space Complexity: O(1)

I=1 , j=1, ---🡪n----🡪n^2

I=2, j=1; ----🡪n----🡪n^2

I=3,j=1;-----🡪0----🡪n

I=4,j=1;-----🡪n----🡪n^2

I=5,j=1;-----🡪0----🡪n