Question 1 :-

tuesday 17
(48-317)

1) Find the time complexity for the following scenarios

a) for(i=1 ; i<=n ; i++) // n times
for(j=1 ; i<=n ; j++) // n times infinite time
print("Hi");

→

T(n) = 1st for loop 'n' * 2nd for loop 'n'
= $T_1(n) \times T_2(n)$
$T(n) = n^2$ (without infinite loop)

Conclusion :- There is no Time complexity as 2nd for loop goes in infinite loop because of 'i' condition

for i=1 , j=1 , 1,2 ← 5 , = 5 times
i=2 , j=2 , 2-5 = 4 time
i=3 , j=3 3-5 = 3 time
i=4 , j=4 4 5 = 2 time
i=5 , j=5 5 = 1 time.

notes

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6) for(i=1; i<n; i*=3)
    for(j=1; i<n; j++)
        print("Hello");

Ans →

1st for loop - will execute $\log_3 n$ times

i.e. step=6 $i = (3)^0 = 1$

Let $n = (3)^6$

$\therefore \log_3 n = 6$

$T_1(n) = \log n$

2nd for loop goes in infinite loop if condition 'i<n' change to 'j<n' Then Time complexity will 'n'

$T_2 = (n)$ if $j<n$

$T(n) = T_1(n) * T_2(n)$

$= \log n * n$

$= n \log n$

without infinite loop

notes