Tutorial Sheet

Q1 compute the Big Oh of the algorithm involving one for loop.

Ans)

Time complexity of a loop is considered as $O(n)$ if the loop variables are incremented / decremented by a constant amount.

Example

	Cost	times
int n=100	C_1	1
for (int i=0; i<n; i++)	C_2	n+1
{		
cout << "Hello";	C_3	n
}		

Its Time Complexity will be

$$T_n = C_1 * 1 + C_2 * (n+1) + C_3 * (n)$$
$$= C_1 * 1 + C_2 n + C_2 + C_3 n$$
$$= (C_2 + C_3)n + (C_1 + C_2)$$

It is in the form of
$$T_n = an + b$$
So its Time complexity will be

$$\Rightarrow O(n)$$