20.18. TIME COMPLEXITY CALCULATION NESTED FOR LOOP (MORE THAN TWO LOOP).

EXAMPLE 4

```
for(i = 1; i ≤ n; i++){
    for(j = 1; j ≤ n; j++){
        for(k = 1; k ≤ n; k++){
            for(l = 1; l ≤ n; l++){
            c = c + 1;
        }
    }
}
```

ANSWER

The loop runs like:

$This\ loop\ will\ definitely\ execute\ n^4 = O(n^4) times.$
$As\ inner\ most\ run\ n^3\ times\ n = n \times n^3 = n^4. or$

$$n \times n \times n = n^3 = O(n^3)$$

where i run upto n times makes j to run n times n i.e. n^2 and j makes k to run n^2 times $n = n^3$ and k makes l to run n^3 times $n = n^4$ and c = c + 1
will get printed n^4 times .

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