

Q4:

```
for (int i = 1; i <= n; i += c) {  
    // some O(1) expressions  
}
```

=>  $\frac{O(1)+O(1)+O(1)\dots+O(1)+O(1)}{\text{total } N \text{ times}}$

=>  $N \cdot O(1) = O(N)$

Q5:

```
// c is constant  
for (int i = 1; i <= n; i += c) {  
    for (int j = 1; j <= n; j = pow(i, c)) {  
        // some O(1) expressions  
    }  
}
```

```
for (int i = n; i > 0; i += c) {  
    for (int j = i+1; j <= n; j *= c) {  
        // some O(1) expressions  
    }  
}
```

=> 1<sup>st</sup> for loop:

=> inner loop:  $\frac{O(1)+O(1)+O(1)\dots+O(1)+O(1)}{\text{total } \log\log N \text{ times}}$

=> outer loop: total  $N/c$  times;

=>  $\log\log N \cdot O(1) \cdot N/c = O(\log\log N) \cdot N = O(N\log\log N)$

=> 2<sup>nd</sup> for loop:

=> inner loop:  $\frac{O(1)+O(1)+O(1)\dots+O(1)+O(1)}{\text{total } \log N \text{ times}}$

=> outer loop: total  $N/c$  times;

=>  $\log N \cdot O(1) \cdot N/c = O(\log N) \cdot N = O(N\log N)$

Compare  $O(N\log\log N)$  and  $O(N\log N)$ , and use the larger one;  **$O(N\log N)$**  is larger.