

Question 1

What is the time, space complexity of following code:

```
int a = 0, b = 0;

for (i = 0; i < N; i++) {

    a = a + 1;

}

for (j = 0; j < M; j++) {

    b = b + j;

}
```

Ans:

Lets see how many times **count++** will run.

When $i=0$, it will run 0 times.

When $i=1$, it will run 1 times.

When $i=2$, it will run 2 times and so on.

Total number of times **count++** will run is $0+1+2+\dots+(N-1)=N*(N-1)/2$. So the time complexity will be $O(N^2)$.

Question 2

What does it mean when we say that an algorithm X is asymptotically more efficient than Y?

- a) X will be a better choice for all inputs
- b) X will be a better choice for all inputs except possibly small inputs
- c) X will be a better choice for all inputs except possibly large inputs
- d) Y will be a better choice for small inputs

Ans: b) X will be a better choice for all inputs except possibly small inputs