# Worst Case Equation

Find the worst-case runtime f(n) for the following algorithms.

- Specify the number of operations executed for an input size n, for the worst case run time as a function of n.
- Surround the statement(s) with a box and draw a line to the right side specifying the number of operations.
- If statement(s) are a part of an iteration of n, specify the total number of iterations as a function of n.

1. Algorithm-01

   Find the worst case run time function f(n) of the following algorithm.

```
int sum = 0;

for (int i = 1; i <= n; i++)

    for (int j = 1; j <= n; j++)

         sum++;


for (int i = 1; i <= n; i++)

    for (int j = 1; j <= 10; j++)

        sum--;
```

2. Algorithm-02

Find the worst case run time function f(n) of the following algorithm and show that this algorithm has an order of log n.

```
int sum = 0;

int j = 1;

while (j <= n) {

   sum++;

   j = j * 2;

}
```