1) Function $x = f(n)$

```
x=1;
for i=1:n
  for j=1:n
    x=x+1
```

1) find the runtime of algorithm mathematically

sol)

-> Outer loop runs from i=1 to n ('n' iteration)

-> Inner loop runs from j=1 to n ('n' iterations)

-> constant operation in Innerloop = x ± 1

$$T(n) = \sum_{i=1}^{n} \sum_{j=1}^{n} 1$$

$$= \sum_{i=1}^{n} n \cdot 1$$

$$= n \cdot n \cdot 1$$

$$\therefore T(n) = n^2$$

=> Runtime of algorithm is $O(n^2)$