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Hands on-3

1. Given

```
function x = f(n)
  x=1
  for i = 1:n
    for j = 1:n
      x = x+1
```

1. find the runtime of the algorithm mathematically (~~i should see~~ (summations)

Sol// from the given function

x is intialized with 1

loops

Outer loop runs i = 1:n where i=1 to i=n times. So It iterates n times

Where as Inner loop j = 1:n It runs j=1 to n. So It iterates n times

Operation:

→) In the Inner loop the operation x=x+1. where It is constant operation. It performs for i and j

mathematically

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

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

$$= n \cdot n 1 = n^2$$

$$\boxed{T(n) = n^2}$$

The runtime ~~operator~~ of algorithm is

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