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Hands On - 3

1. Find the runtime of algoritm mathematically

Ans → So here outer runs n time

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

$$T(n) = 1 + (n+1)\ (n^2+n) + n^2$$
$$T(n) = 2 + 3n + 3n^2$$

2. In github code.

3. Find polynomials that are upper and down bounds on your curve from #2

Ans →
Big-O ⇒ the upper bound on graph shown by the graph dashed line, which slightly exceeds the pither curve.

Big-omega → So this represents the lower Bound on time complexity So at groowes atleast guaranticly repeat to n so $\Omega(n^2)$

Big theta: Since both the upper and closely follow the actual timing data runtime is $\Theta(n^2)$.

4. In github

```
x= f(n)
  x = 1;
  y = 1;
    for j = 1 : n
      for j = 1 : n
        x = x + 1;
        y = 1 + y;
```

4. will this increase new long it takes the algorithm to run.

Ans. Yes the modifier function will take slightly more time to run because of opretion y=i+y, within inner loop. However, this operation is constant ~~term~~ time O(1), and since it's executes same time as the other operation.

5. Will it effect your result from #1.

→ So it will not effect the results as the time ~~So~~ complexity will remain the same $o(n^2)$ So the ari teary doesnot affect the complexity.