

Hands on - 3

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1) refer. Hands on 3 File

2) refer Hands on 3 File

(for code - Hands on 3 File)

(for graph - 2. Fitted - polynomial)

3) ~~polynomials~~ polynomials for the curves which are lower and upper bounds to the curves

from the 1st solution we know that

a) Big-Theta (upper & lower bound)

$\Theta(n^2)$ is the runtime of the function

b) Big-O (upper bound)

function = $f(n)$

$$\text{Big O} \Rightarrow 0 \leq f(n) \leq c \cdot g(n)$$

$$\Rightarrow n^2 \leq c \cdot n^2$$

\rightarrow here 'c' is a constant

eg: let $c=3$

then

$n^2 \leq 3n^2 \Rightarrow O(n^2)$ is the upper bound.

c) Big Omega (Ω)

function = $f(n)$

$$\text{Big } \Omega = 0 \leq c g(n) \leq f(n)$$

$$= c \cdot n^2 \leq n^2$$

\rightarrow "c" is a constant

eg: $c = 0.5$

$$0.5(n^2) \leq n^2 \Rightarrow \frac{n^2}{2} \leq n^2 = \Omega(n^2)$$

is the lower bound.

\rightarrow In this polynomial the upper bound, ~~upper~~ and lower bound are the same

\rightarrow thus the best case, average case and the worst case of this algorithm are ~~the~~ the same as it gets executed n-times anyways.

[For Further code and graph please refer to Hands on 3 File for code and for graph - upr - lower-bound - png]

4) Eye ball location of $N(0)$

→ refer Hands on 3 file

4) will it increase ^{how long} it takes the algorithm to run?

→ refer Hands on 3 file

5) will it effect your results from #1?

6) Implement merge sort

[refer ~~hands on~~ merge sort.py]