Algorithmic Analysis - 1

Q) Algorithm :-

An algorithm is step by step instructions to solve a given problem.

E.g :   Prepare biriyani

Algorithm :-
  1. Get a frying pan
  2. Take the oil, rice, veg
  3. Turn on the stove
  4. Cook it for 30 min.

Problem :- Reverse the arr.

arr - 1, 2, 3, 4, 5

O/P - 5, 4, 3, 2, 1

Algo :-
  1. Swap 1st & last elem
  2. Swap 2nd & 2nd last elem.

  1. Read the prob
  2. Devise algo
  3. Code algo

10% coding

90% algo

flight

(A) ——— Bus ——— (B)

train

Speed
→ Flight
→ train
→ Bus

Cost
Bus
train
flight

Comfort

Q. **Goal Of alogrithm analysis**

→ The goal of Algo anal. in term of
  → **Time**
  → **Memory & Space**

Time
Space

Coding Ground
① correct Sol^n
② Timing Complexity
③ Space Complexity

Q. How to go algo. anal.
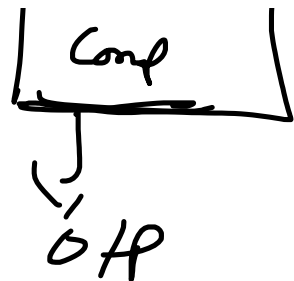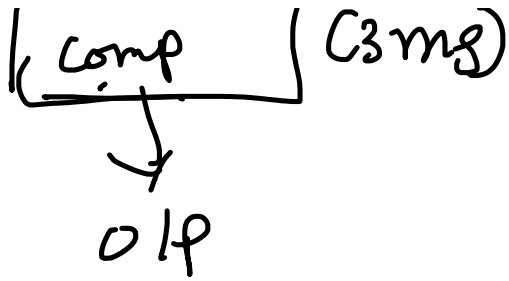
I. **Experimental analysis.**

Arudhiya   Joseph

Alg.1   Alg.2

                    (3.5) ms

[Comp] (C3mg)   [Comp]

↓   ↓
O/p   O/p

Disadvantages:- Aradhya → 16 gb ram

Joseph → 4 gb ram

Sol^n → Machine dependant

2. **Asymptotic analysis**

i ⇒ not rely on machine

→ Compare alogrithms based on the
input rate of growth.

Reverse an
array   Aradhya   Joseph
length Sol^n Sol^n
$n =$ Algo1   3mg   Algo2

n=5   3mg   n=5

Comp
Steps
3-1 mg

[n= 100]   3.1mg n=100

3-5mg   10min

n= 10000   n = 10000
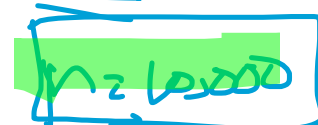
for(i=0; i<n; i++)
i<5

① Iterate an array :

② Compare two values ....(n<=y) →

$n = 5$

$1 \Rightarrow$ 5 Comp. Steps $\longrightarrow$ Comp. Step.

$2 \Rightarrow$ 1 Step