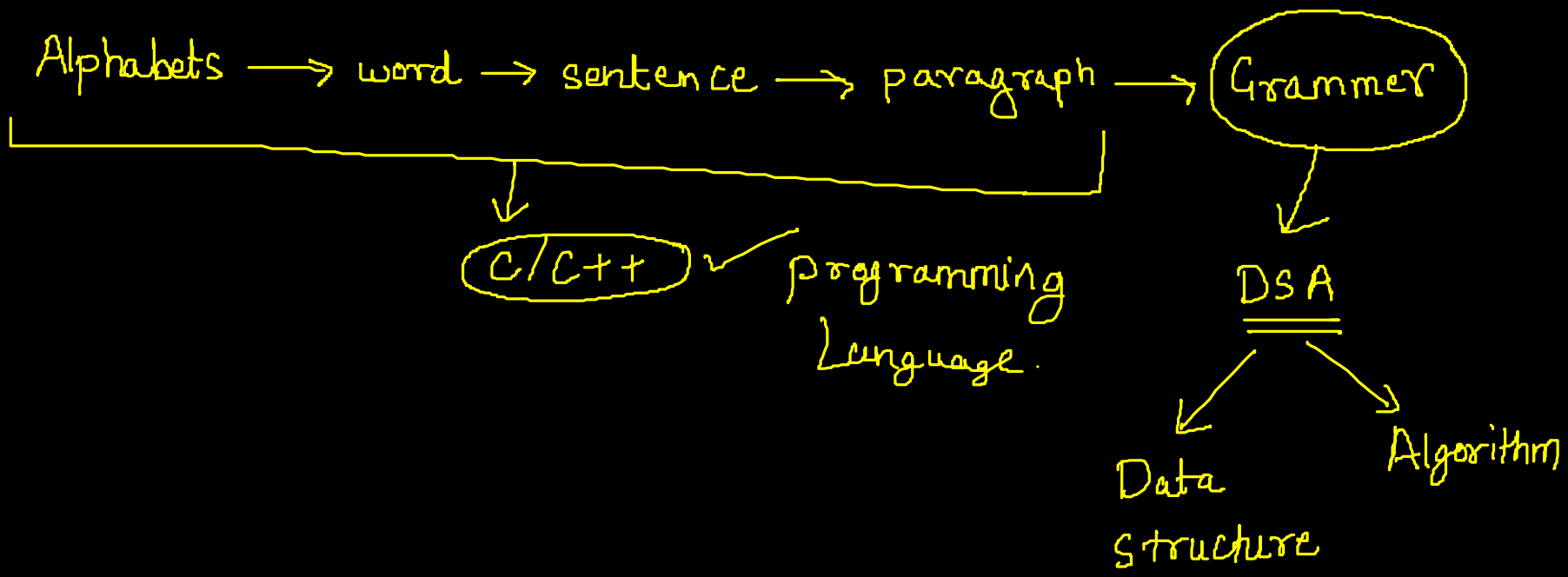
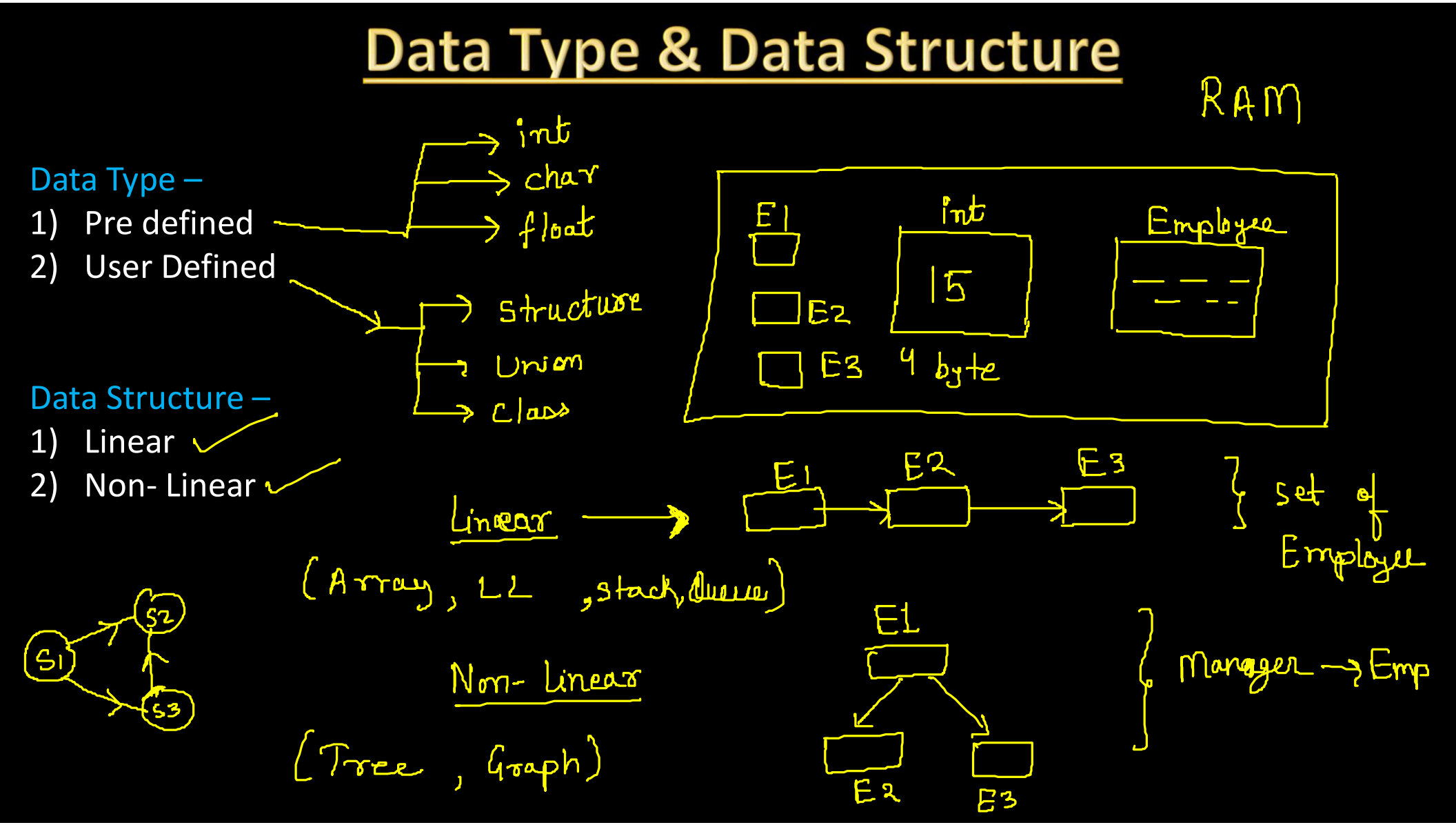
Introduction to DS and Algorithms



Data Type & Data Structure



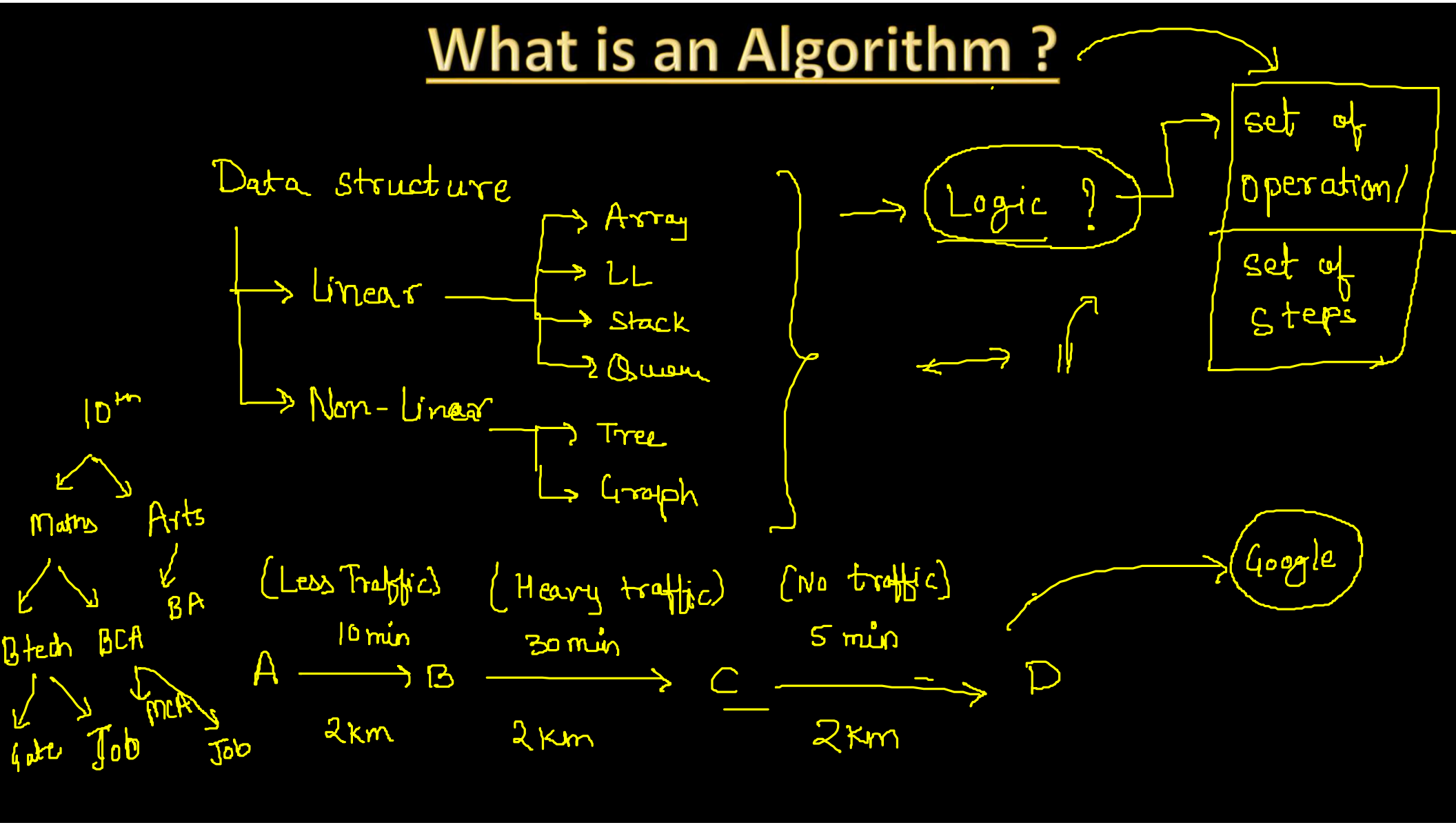
Abstract Data Type (ADT)

1) Data Type
2) Set of Operations

```
class ABC
{   int x, y;
        +
    add(), sub(), multi() div(), ...

};
```

What is an Algorithm ?



Analysis of Algorithm

A1 A2

1) Space ✓
2) Time ✓

P1 → C1 (5 min) T1 Q1 P1

P2 → C2 (10 min) T2 Q2 P2

P3 → C3 (2 min) T3 Q3 P3

Comp → memory ✓ / Time ✓

Comparision

P1	P2	P3
1000	300	100 → execution Time
100	200	150 → line
10	5	(30) → variable

Chai

- ✗ no. of Question
- ✗ no. of hour
- ✗ face
- ✓ Quality
- ✗ Job
- ✗ fees

Rate of Growth

$n = 2, 3, 4, 5, \ldots$

t_1 t_2 t_3

2,4,8,16 , ... 32, 64 ⟶ multiply by 2. ⟶ $2 \times t_n$

~~**1,3,9,12 , ...**~~ 1, 3, 6, 9, 12 ⟶ $\times 3$ ⟶ $3n$

2,4,8,16, ... ⟶ $2^1, 2^2, 2^3, 2^4$ ⟶ 2^n

1 2 3 4

equation

Types of Equation –

- **Linear**
- **Quadratic**
- **Cubic**
- **Bi-Quadratic etc**

$y = ax^2 + bx + c$

$y = 2x^2 + 3x - 5$

$y = ax^3 + bx^2 + cx + d$