① find highest NF of R(A, B, C, D, E)

with FDs { A → D, B → A, BC → D, AC → BE }

Checking 1NF

- Since no MVA, ⇒ in 1NF

Checking 2NF it's in 1NF

$(CD)^+ = \{C, D\}$

check PD: find keys: {AC, BC}

A → D ⇒ P.D occurs

not in 2NF ✓

Ans: highest NF: 1NF ✓

(2) find highest NF of R(A, B, C, D, E) with

$\alpha \rightarrow \beta$

FD { BC → D , AC → BE , B → E }

in INF , since no MVA

$A \rightarrow E$

Checking 2 NF

C.K. = {AC}

$C \rightarrow D$ $BC \nsubseteq AC$

Prime Attr. = {A, C}

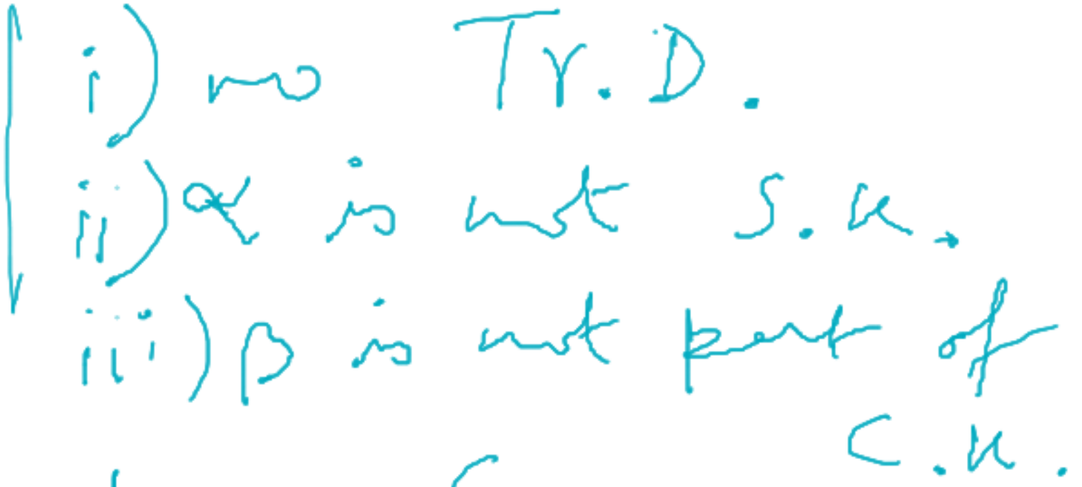
B is not proper subset of C.K.

non-prime attri. = {B, D, E}

BC-> D is in 2NF , since BC is not a proper subset of c.k. AC

AC--> BE is in 2NF, since AC is CK

B--> E is in 2NF, since B is not proper subset of c.k. AC



DATA:

(understand)

Information ≃ data + instruction

 Image data ⟶ $\begin{bmatrix} 2,5 & 125 \\ 0 & 1 \end{bmatrix}_{\text{matrix}}$

- Good / need to improve ⟶ 0 / 1

  0 — 1

[I teach Datebase] ⟶ Text

0/1

High

low

decimal ⟷ Binary

0, 1, ... 9 0, 1

Numerical

I → 6013

Teach → 7033

Database → 1053

Dictionary

A 1

Aaron 2

3

5

r

Cat

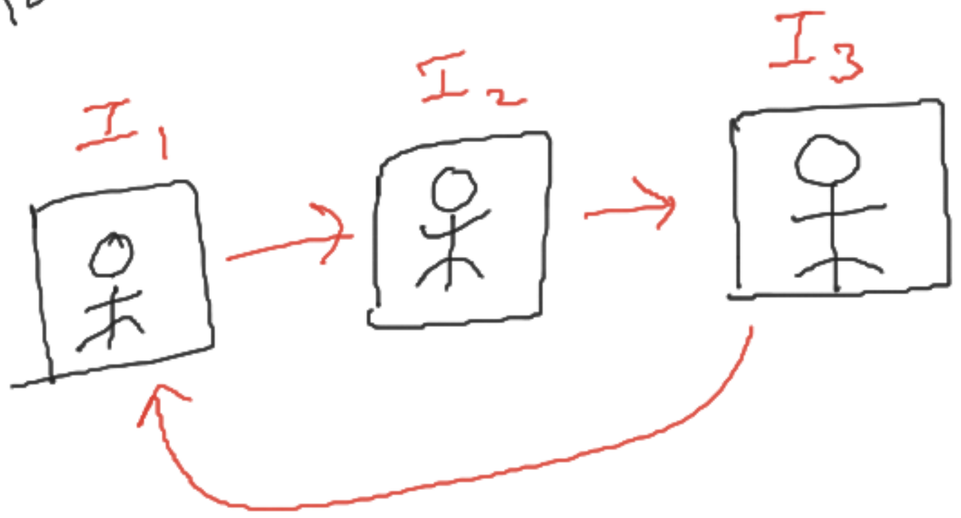
Dog 5010

I

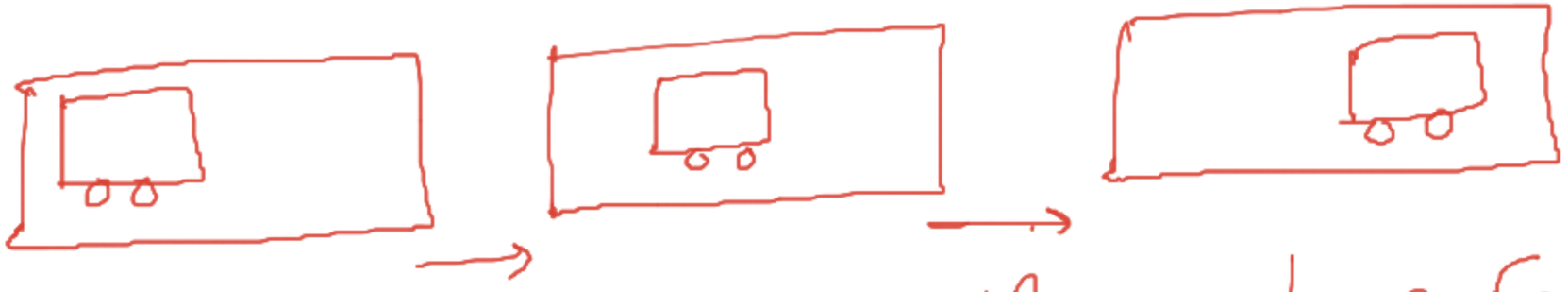
Zebra 10152

Video → Numerical

Sequence of images



FPS: frames / second

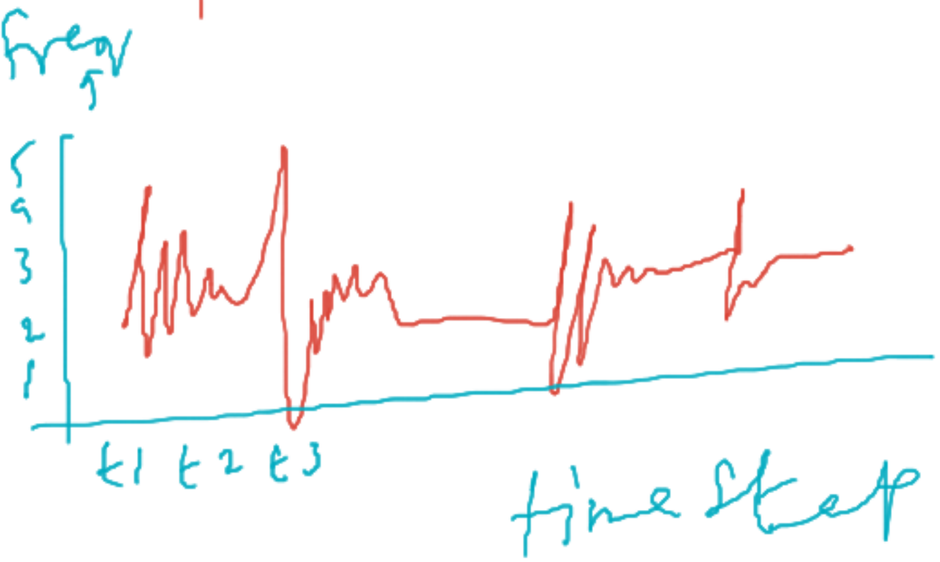


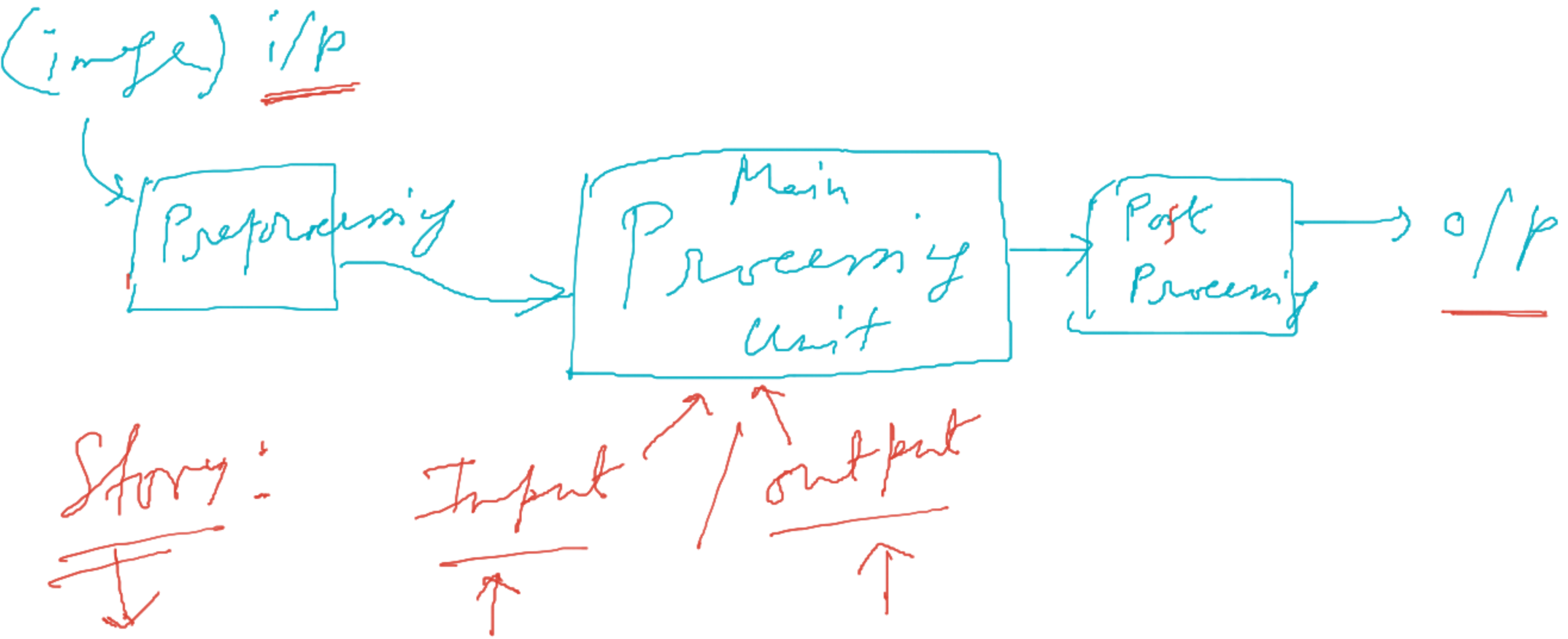
5 second video | 2 FPS

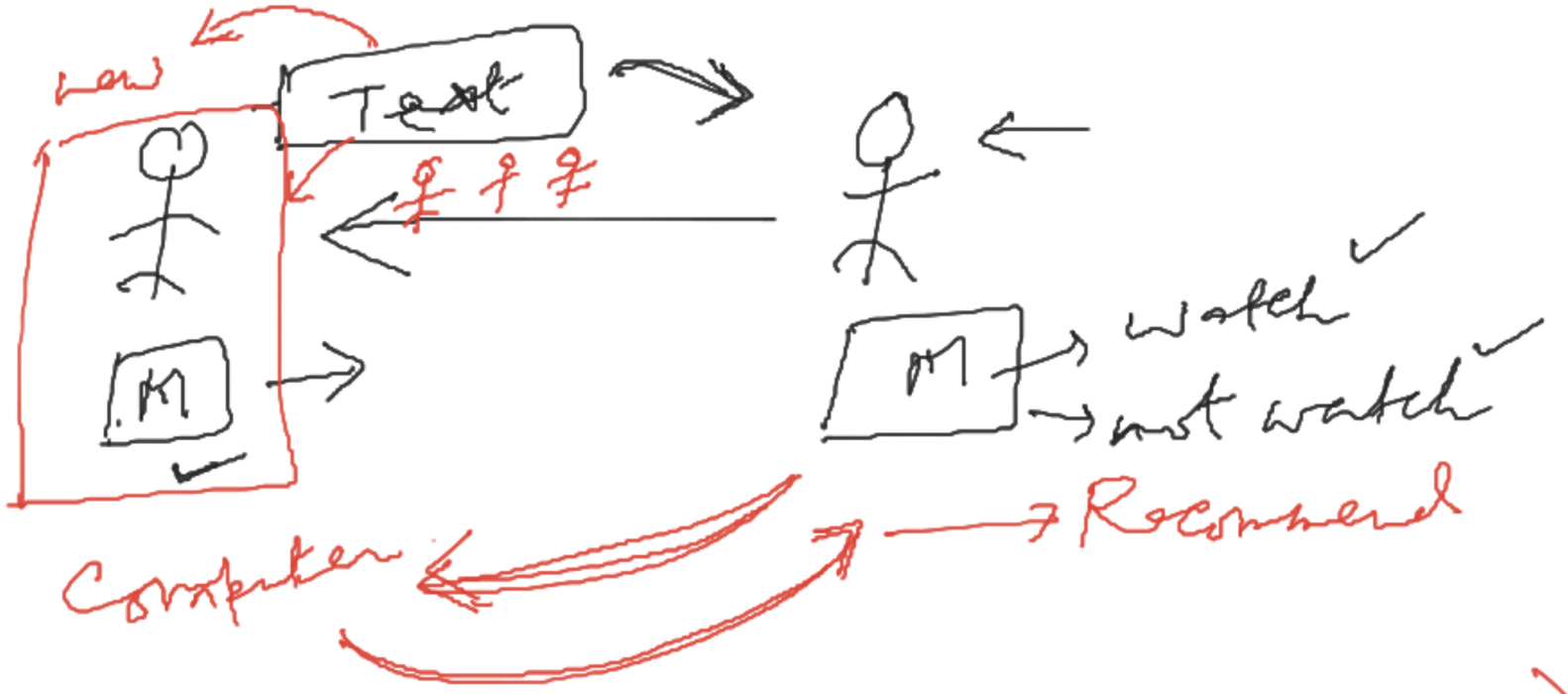
$\#\ \text{Images} = 5 \times 2 = 10$

Time	Freq.
t_1	1
t_2	3
t_3	2
⋮	⋮

Speech



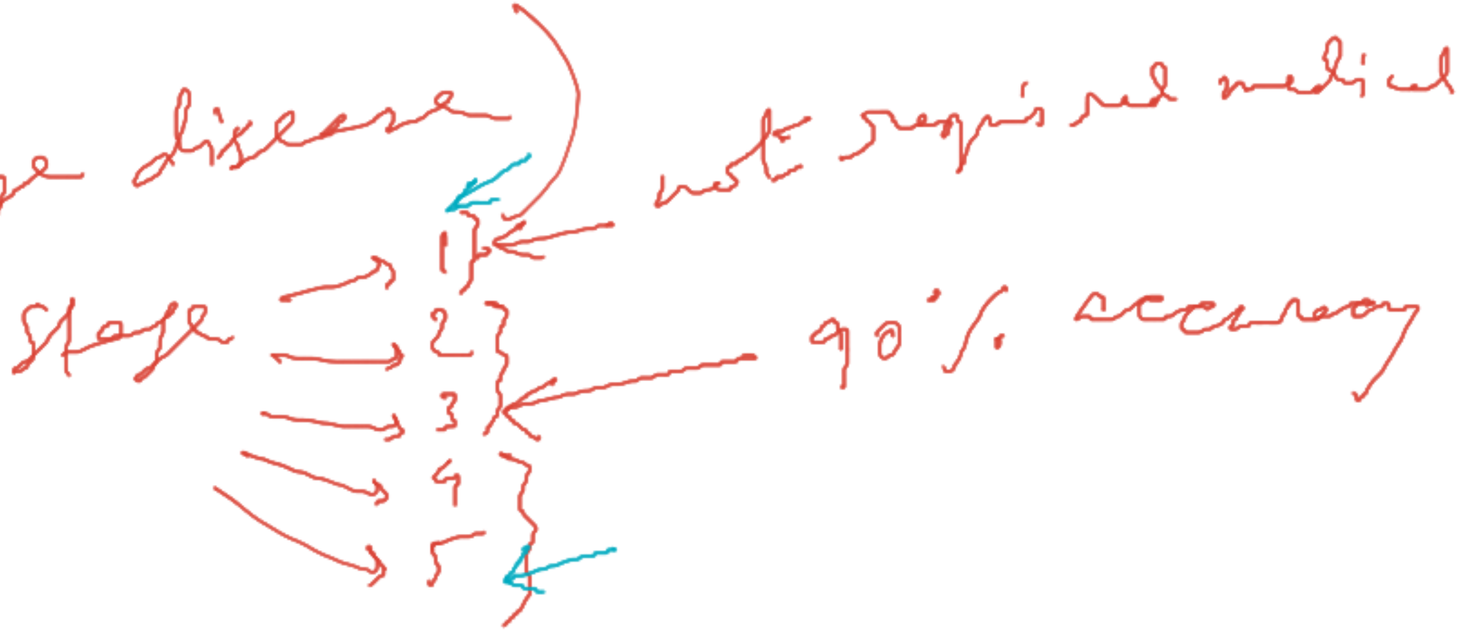

(image) i/p
Preprocessing
Main Processing Unit
Post Processing
o/p
Story :
Input
output



Data Mining
(knowledge)

Glaucoma (Eye disease)
(prevention)

Assisting



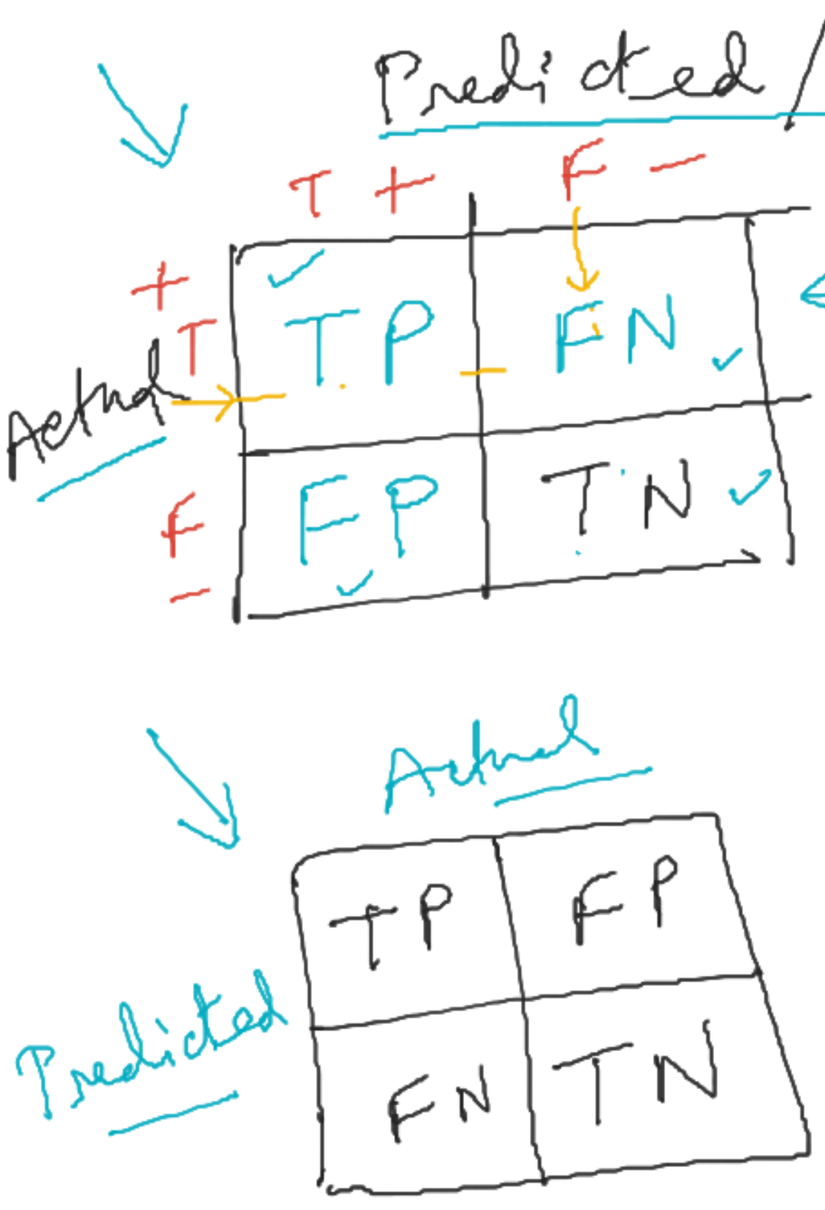
Severe (+ve) / Non-Severe (-ve)

FP: (false positive): Falsely it has been detected as +ve, although it is -ve

FN (false negative): falsely it has been detected as -ve, although it is +ve

TP: (True +ve): Actual +ve correctly detected as +ve

TN: (True -ve): " -ve, ----- -ve



Actually +ve, falsely detected as −ve

Confusion matrix

$$\text{Accuracy} : \frac{TP + TN}{TP + TN + FP + FN}$$

- P: TP + FN
- N: TN + FP

https://en.wikipedia.org/wiki/Precision_and_recall

Accuracy , Balanced Accuracy

F-measure / F score

Precision

✓Recall

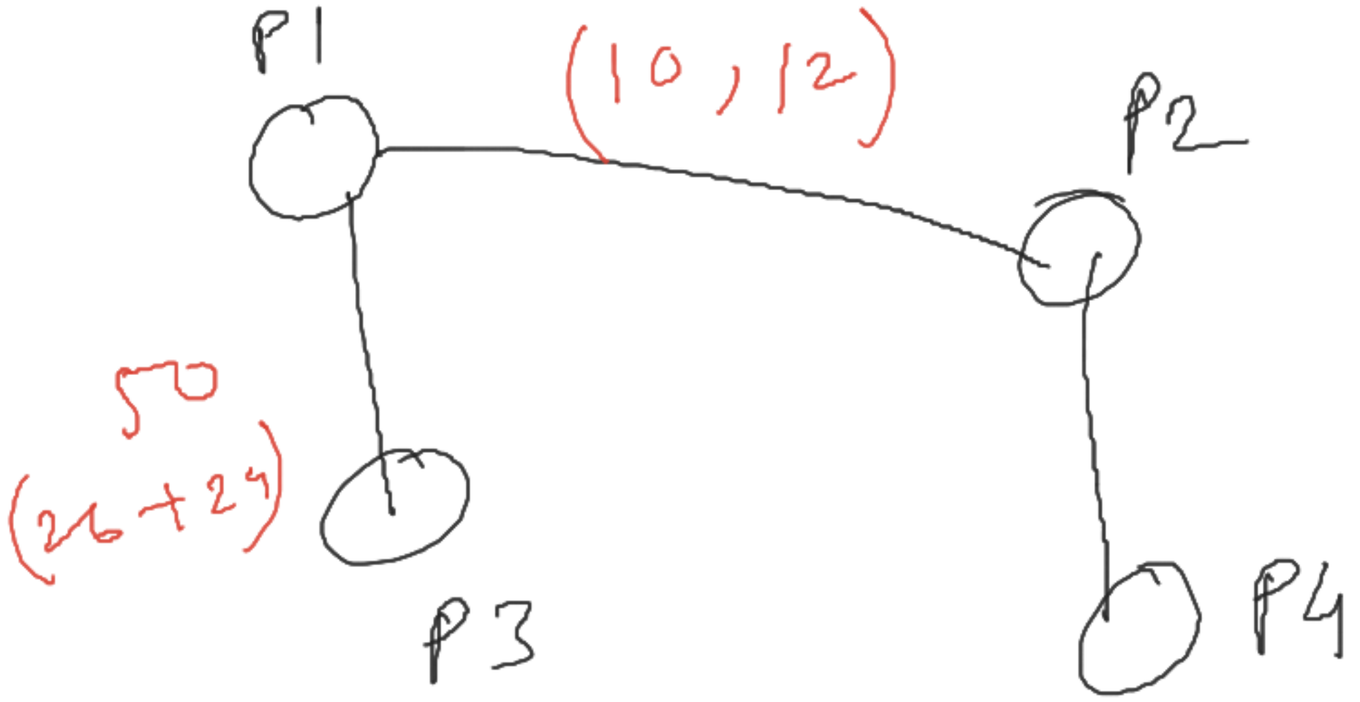
✓Sensitivity

Specificity

✓TPR

FPR

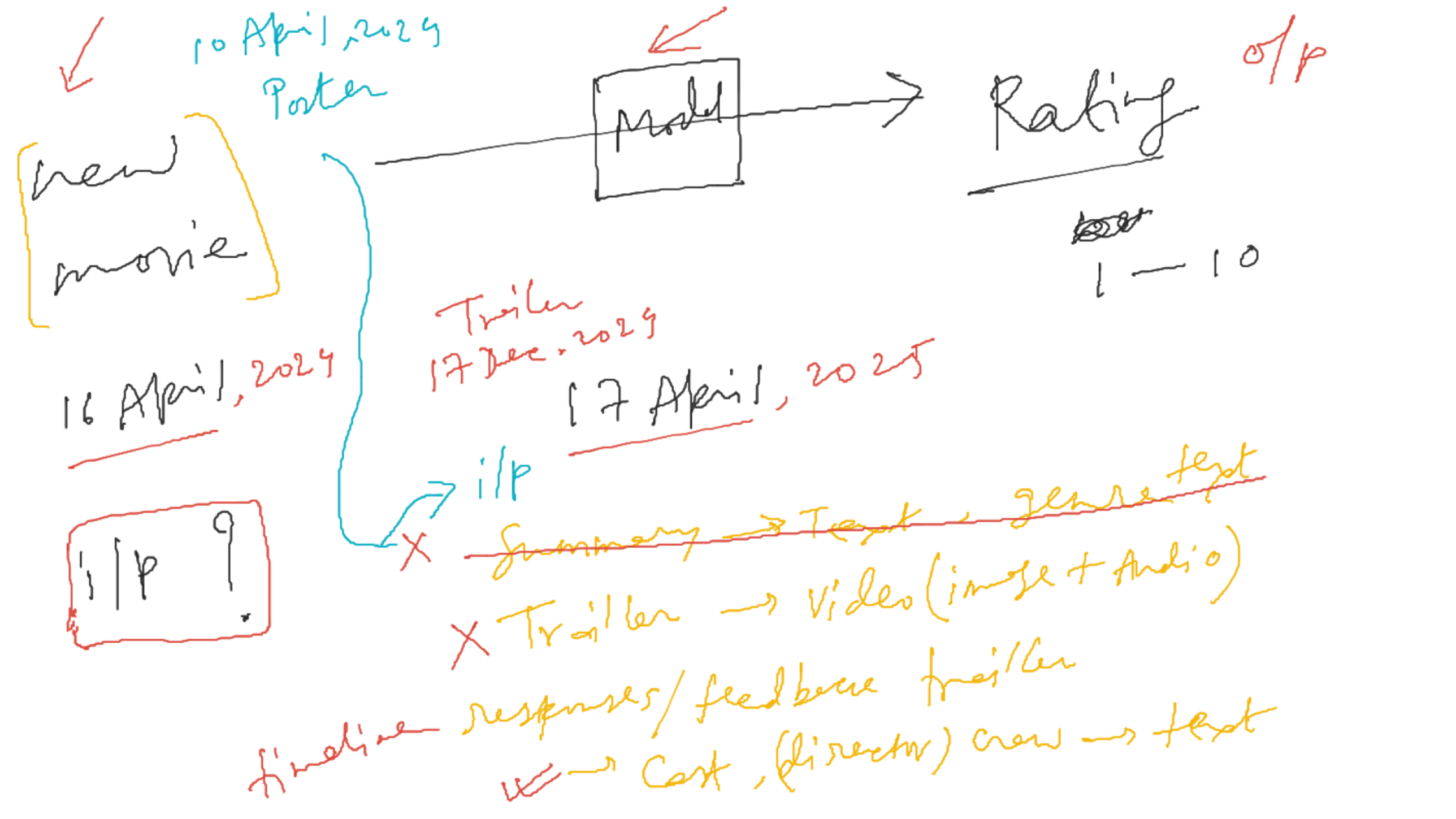
Social media



friendship(P1, P3) > friendship(P1, P2)?

#like, #message

+


10 April, 2024
Poster
new movie
16 April, 2024
Model
Rating
o/p
1 — 10
Trailer
17 Dec. 2024
17 April, 2025
i/p
i/p ?
Summary → Text, genre text
X Trailer → Video (image + Audio)
timeline responses/ feedback trailer
→ Cast, (director) crew → text

Quiz / Assign
↓ continuous internal eval.

DBDM

To make all pass

20/20

Q1

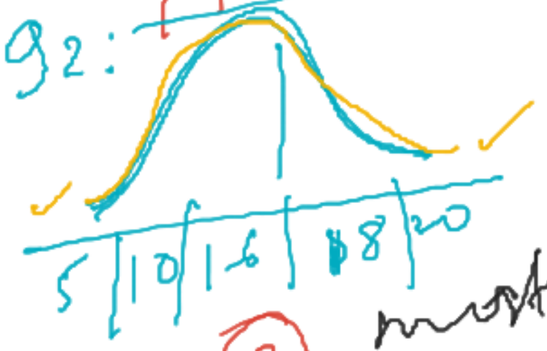
What ?

To prepare the questions

O | P

>90/100

Q2: Hardness



Constraints

① → IIT standard

mostly MCQ, objective

very tough

Gr1	Gr2	Gr3	Gr4
100%	80%	50%	(20% > 50%)

② 1 Ques → SQL