

Baye's Thm - 2

If A and B are mutually exclusive,
then A and B cannot be
independent

ME \rightarrow $\underline{P(A \cap B) = 0}$ \rightarrow mutually exclusive

$\underline{P(A|B) = P(A)}$ \rightarrow independent event

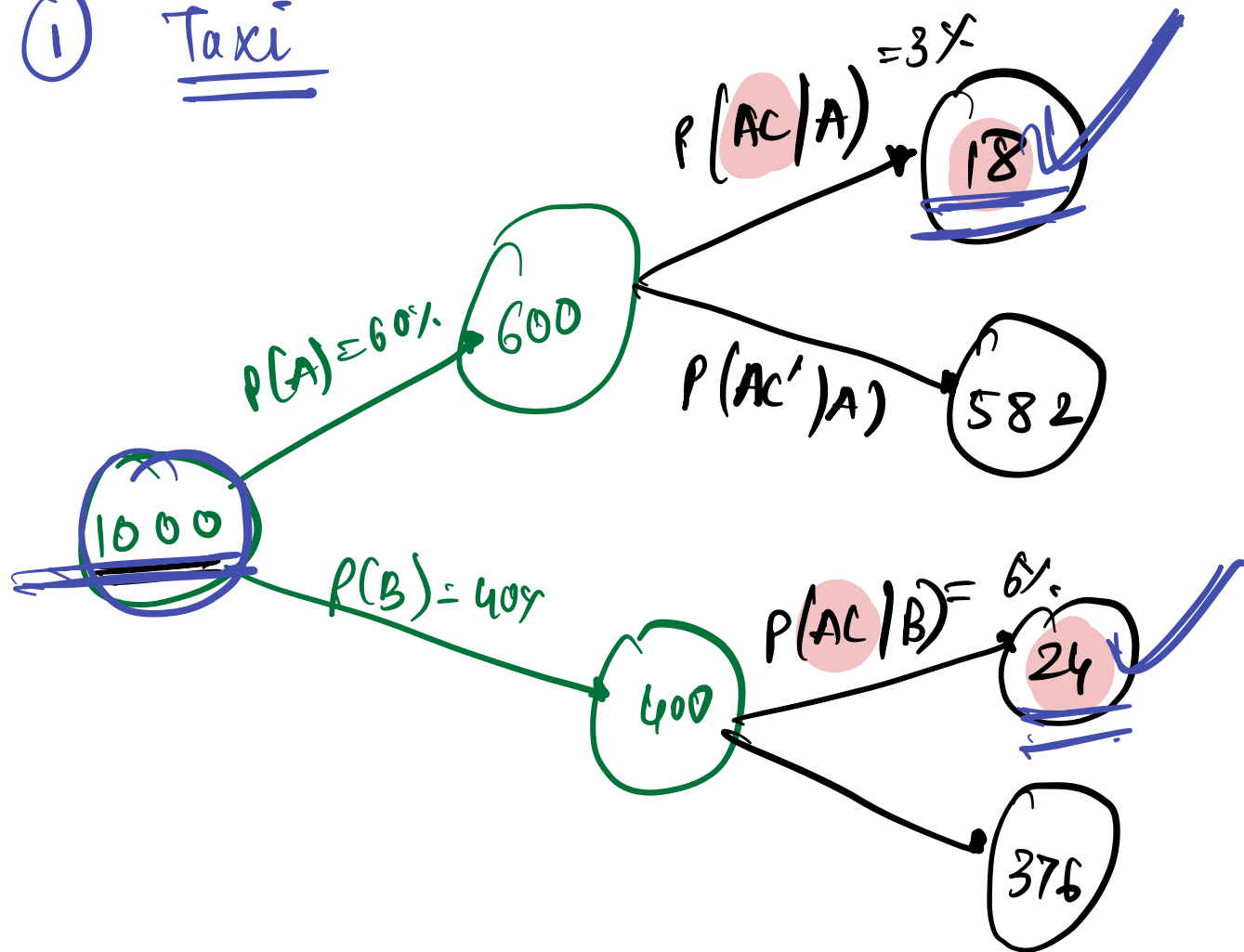
CP $P(A|B) = \frac{P(A \cap B)}{P(B)} = \underline{0} \neq P(A)$
not independent

1	2
3	4
5	6

A → even ✓

B → odd ✗

① Taxi



$$P(B|AC) = \frac{24}{24 + 18}$$

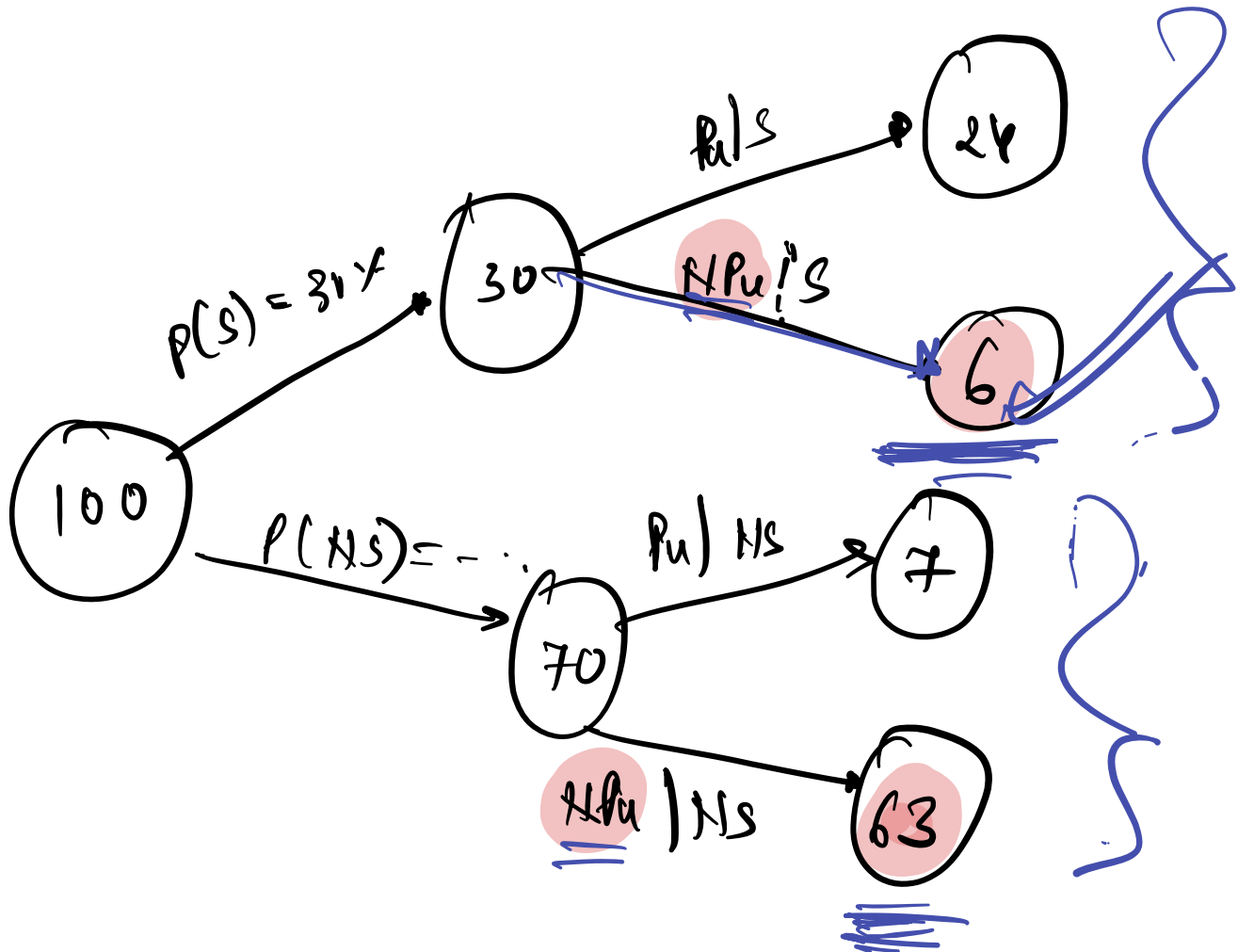
$$= \underline{\underline{57\%}}$$

Prob of Acc →

$P(\text{Acc})$

$$\frac{18 + 24}{1000}$$

② Spam/Not Spam



$$P(S | \underline{NS})$$

How many emails does not have the "purchase"?

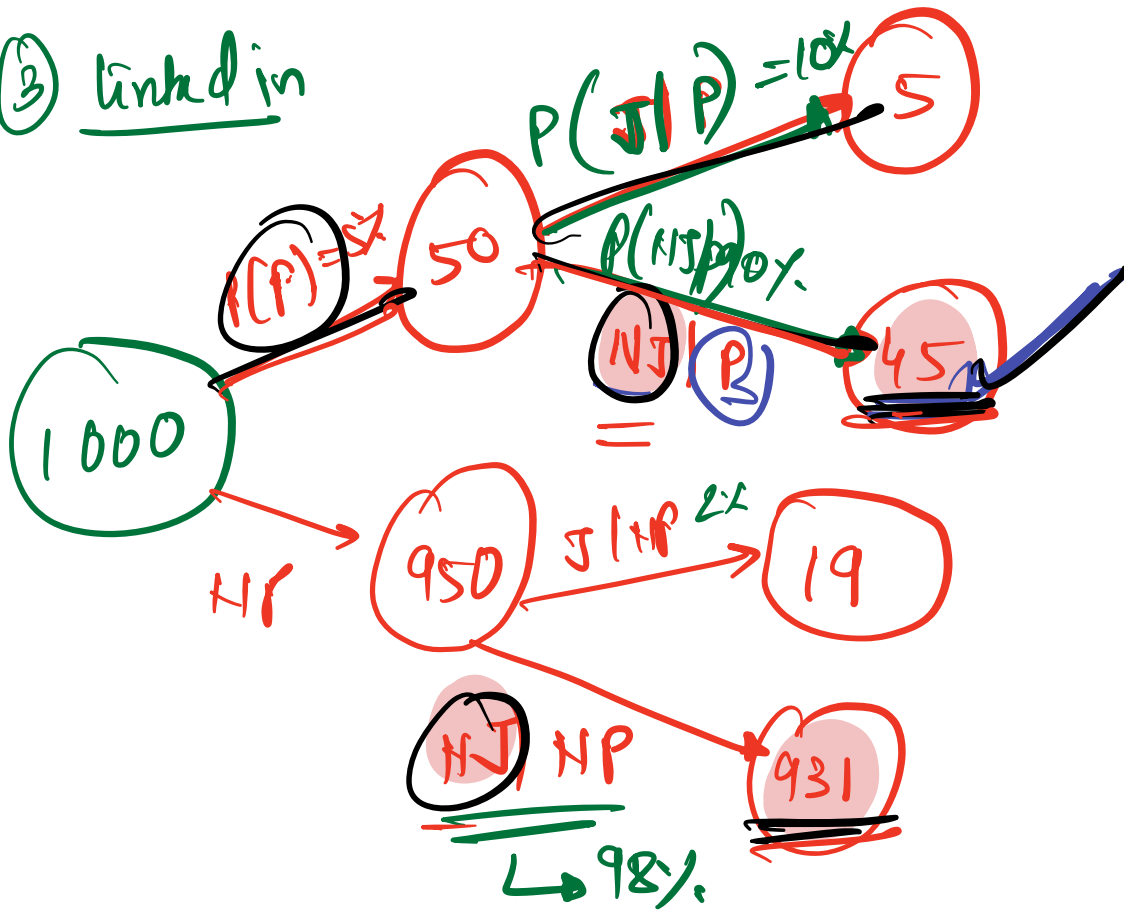
$$6 + 63 = \underline{69}$$

Among them, how many are
spams $\rightarrow 6$

$$P(S | \text{HPu}) = \frac{6}{69} = \underline{\underline{0.08}}$$

$$P(\text{HS} | \text{HPu}) = \frac{63}{69}$$

③ linked in



$$P(P | NS) =$$

$$45$$

$$45 + 931$$

$$= 0.046$$

$$\frac{1}{6}$$

$$P(P_8) = \underline{\underline{0.05}}$$

$$P(J|P_8) = 10\% \\ = \underline{\underline{0.1}}$$

$$P(NP_8) = 0.95$$

$$P(NJ|P_8) = \underline{\underline{0.9}}$$

$$P(J|NP_8) = 0.02$$

$$P(NJ|NP_8) = 0.98$$

$$P(P_8 | NJ) = \frac{P(P_8 \cap NJ)}{P(NJ)}$$

1

$$P(NJ|P\delta) = P(NJ \cap P\delta)$$

$$P(P\delta)$$

$$P(NJ \cap P\delta) = P(NJ|P\delta) \times P(P\delta)$$

$$= 0.9 \times 0.05$$

$$P(P_r | NS) = \frac{P(P_r \cap NS)}{P(NS)}$$

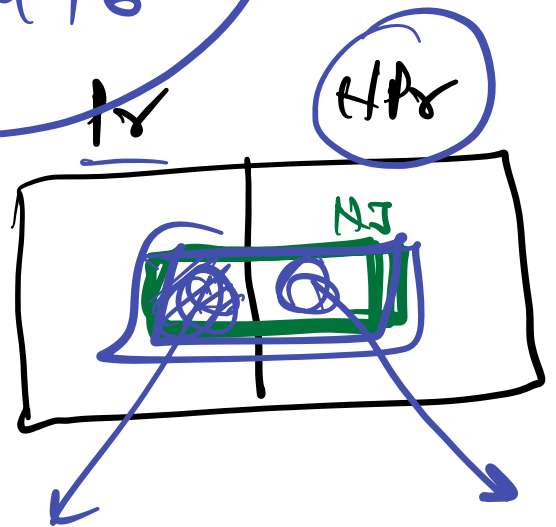
$$= \frac{0.9 \times 0.05}{0.976}$$

$$= 0.046$$

$$P(NS)$$

$$= P(P_r \cap NS) +$$

$$P(NP_r \cap NS)$$

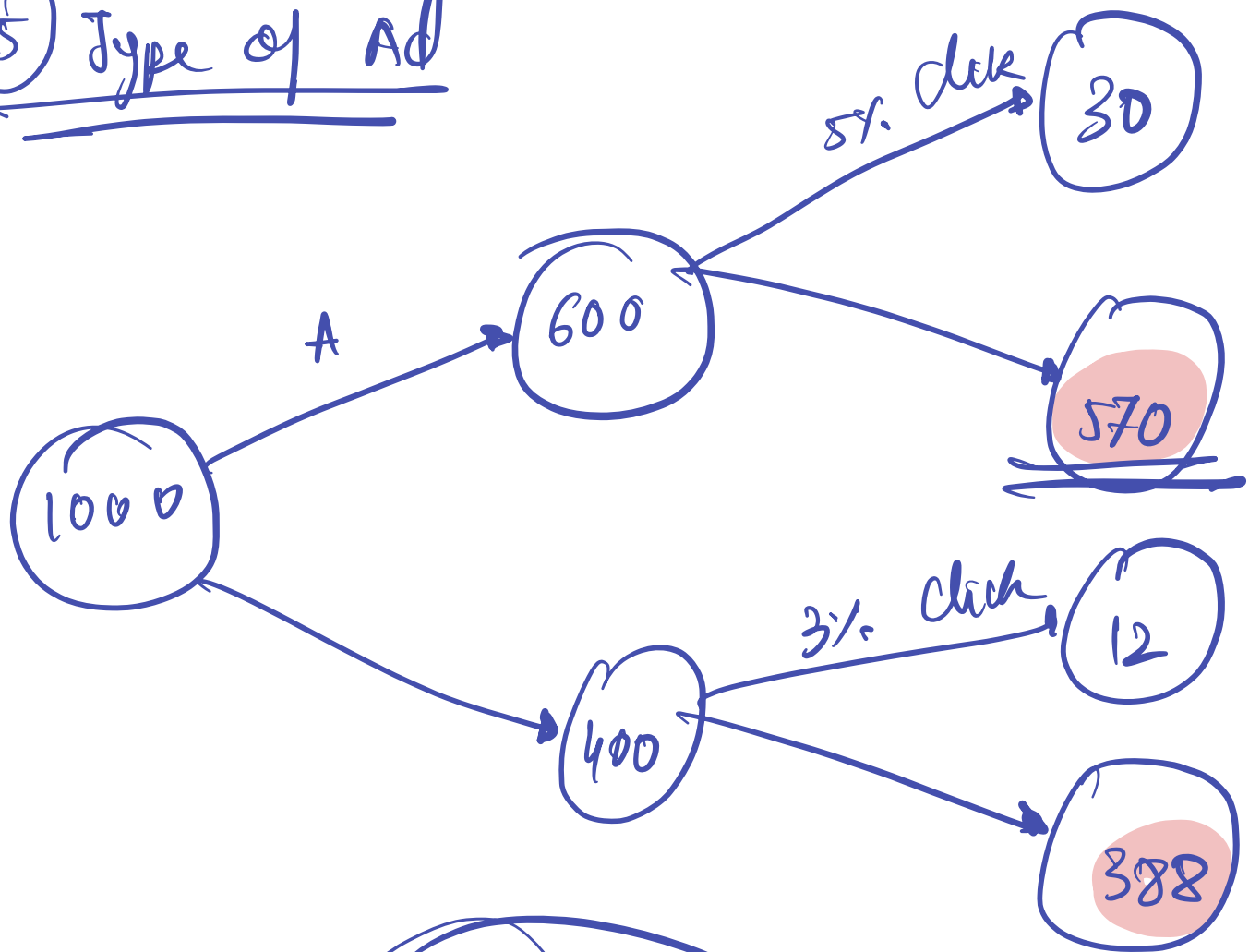


$$= 0.9 \times 0.05 + P(NS | NP_r) \times P(NP_r)$$

$$= 0.9 \times 0.05 + 0.98 \times 0.95$$

$$= \boxed{0.976}$$

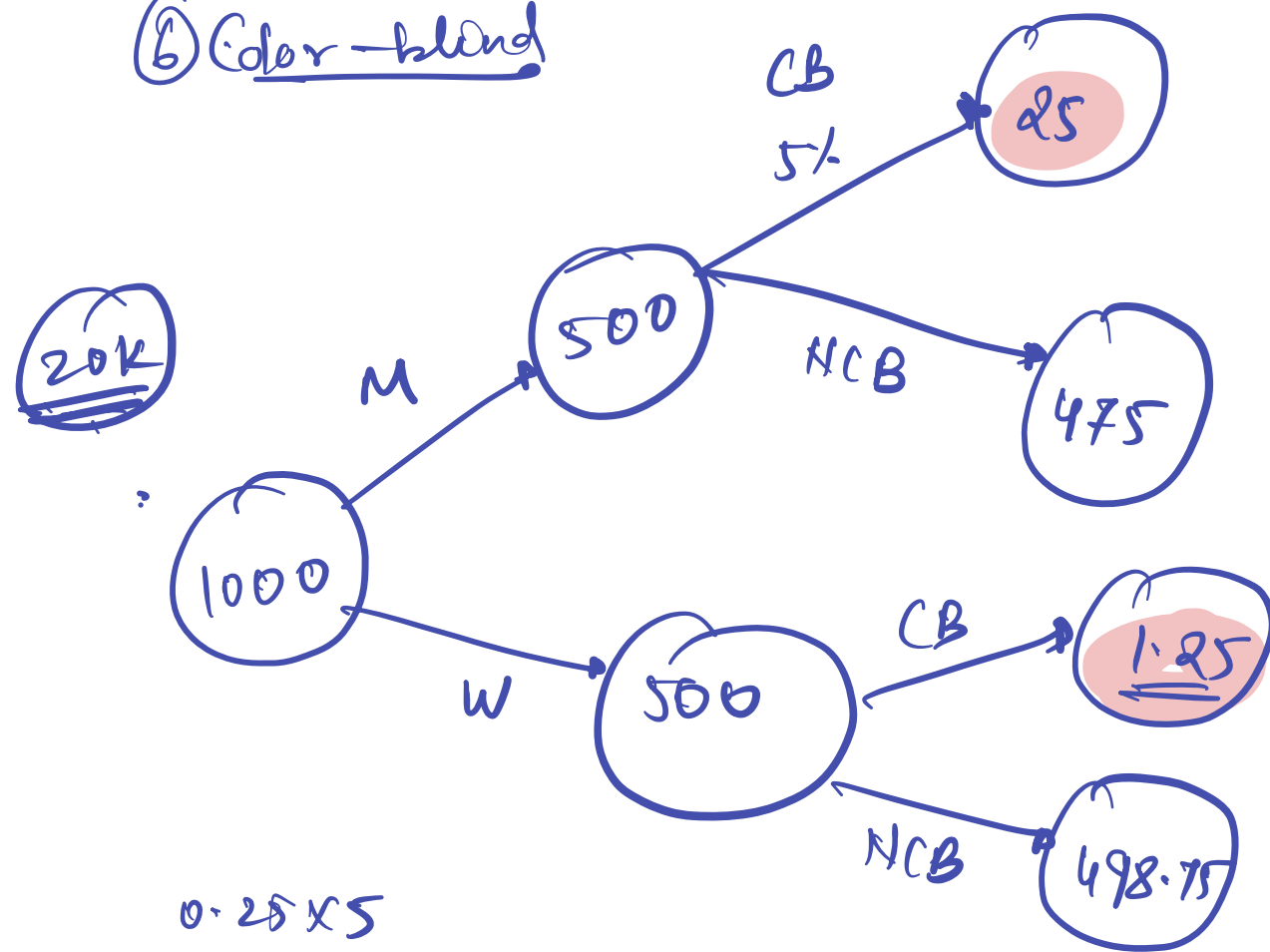
5) Type of Ad



$$\frac{570}{570 + 388}$$

$$\approx 0.59$$

⑥ Color-blind



0.25×5

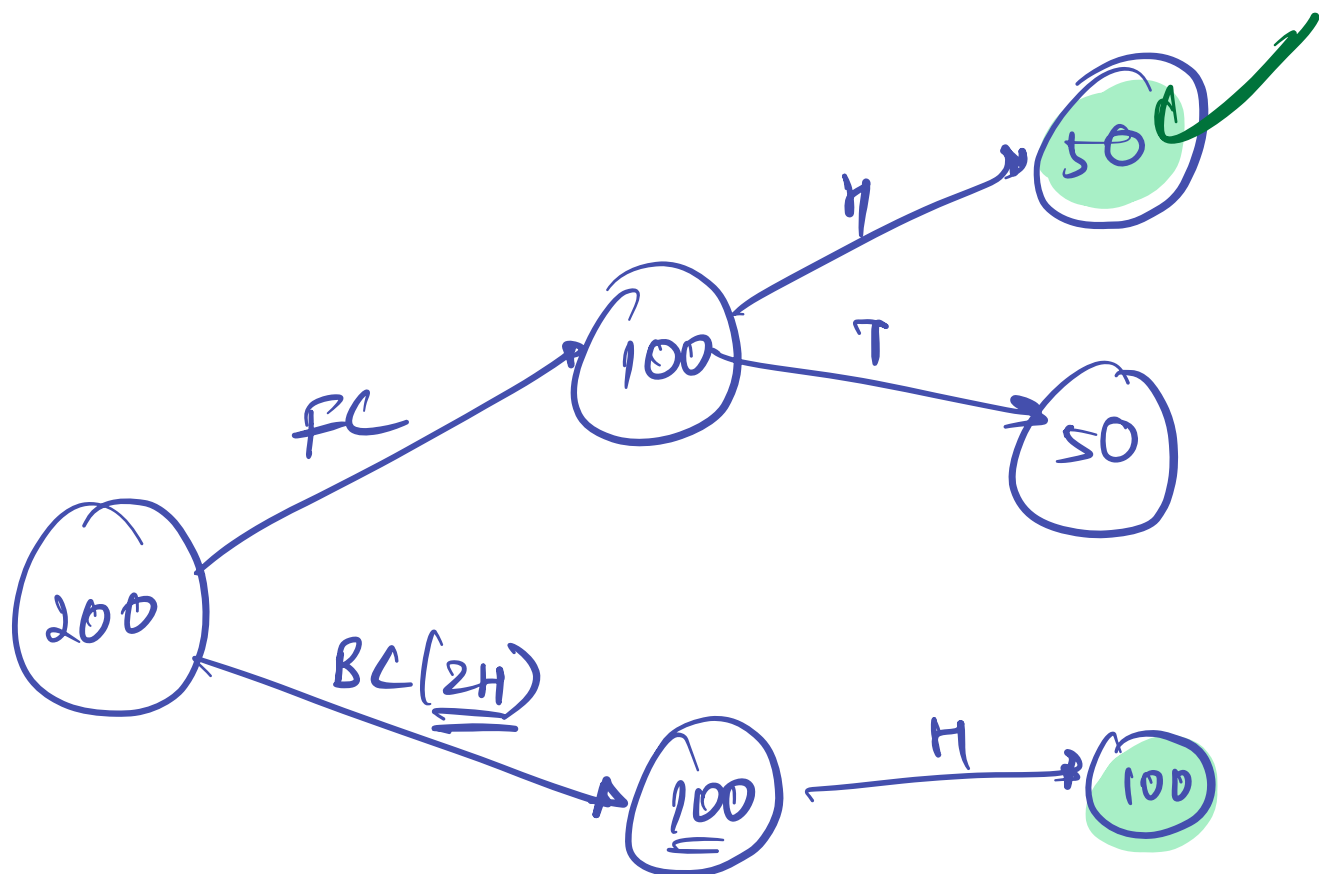
1.25

$P(M|CB)$

$\xrightarrow{25}$

$25 + 1.25$

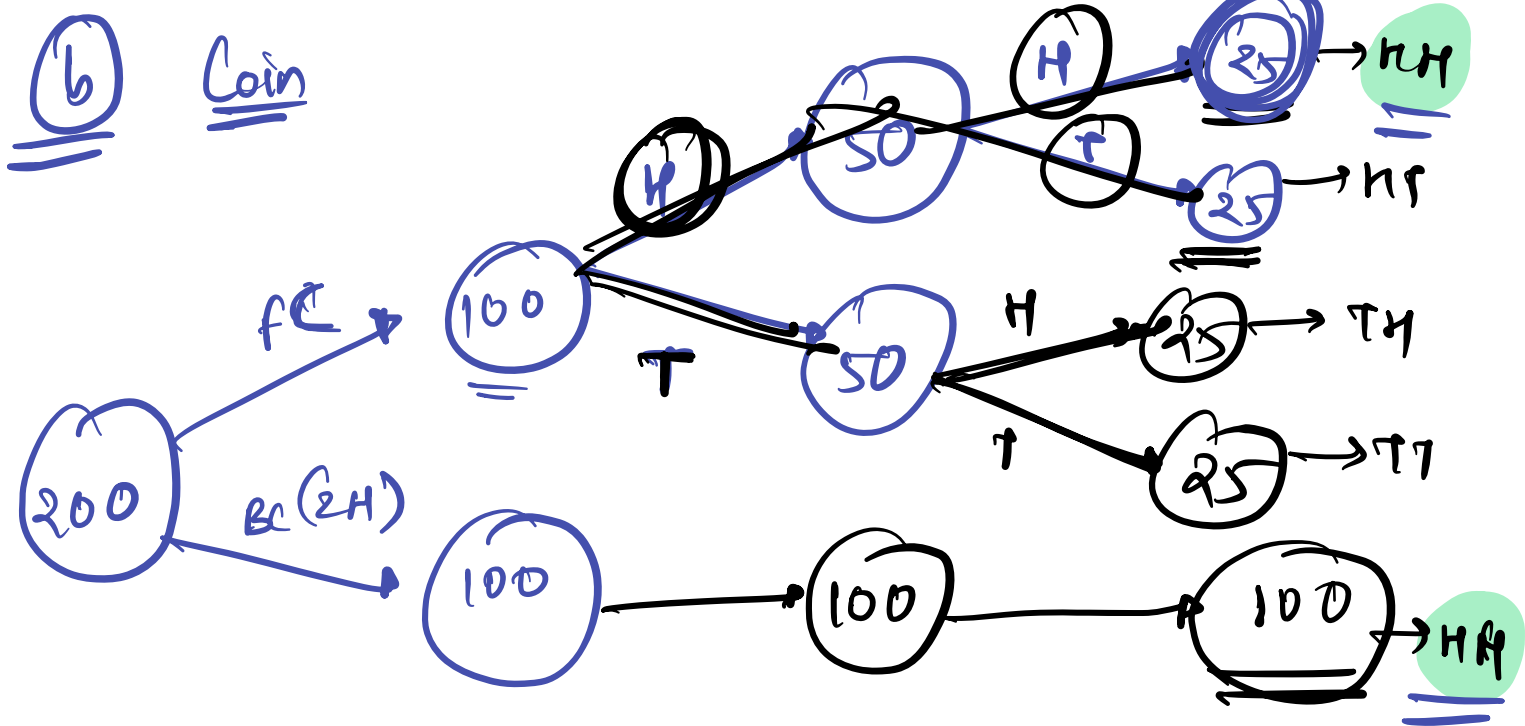
$= \underline{\underline{0.95}}$



$$P(FC | H) =$$

$$\frac{50}{100 + 50}$$

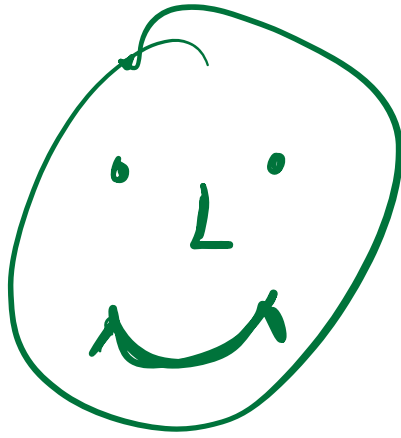
$$= \frac{1}{3}$$



$$P(FC | HH) = \frac{25}{25 + 100}$$

$$= \frac{1}{5}$$

①



100%

(Q.6)

family \rightarrow 2 child

$\{G, B\}$

given 1 girl

Prob of both G = ?

$S = \{BB, GG, BG, GB\}$

$\frac{1}{4}$?

given atleast 1G $\{GG, BG, GB\}$

$$\frac{1}{3}$$

