

Problem set - 1

Taxi problem

Example - 1

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Solⁿ:

$P(\text{the witness see blue} \mid \text{the car is blue})$

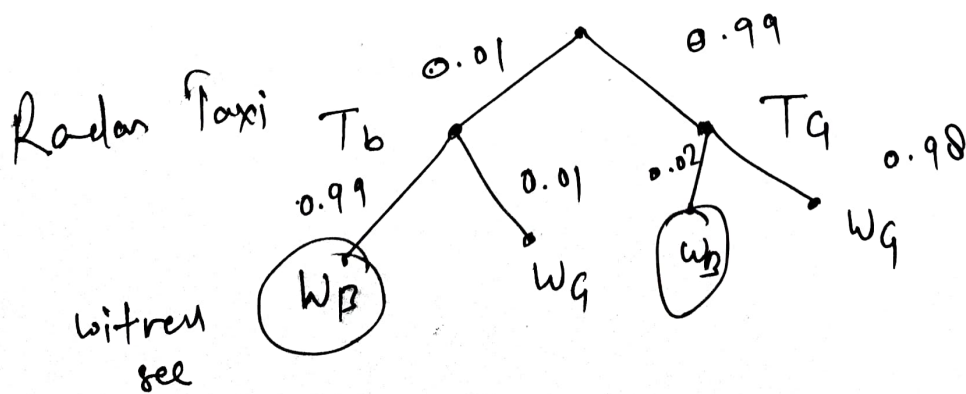
$P(\text{the car is blue} \mid \text{the witness see blue})$

let W_b = "witness see a blue taxi"
 W_g = "the witness see a green car"

T_b = "Taxi is blue"

T_g = "Taxi is green"

$$P(T_b \mid W_b) = \frac{P(W_b \mid T_b) \cdot P(T_b)}{P(W_b)}$$



$$P(T_b) = 0.01$$

$$P(T_g) = 0.99$$

$$P(W_b|T_b) = 0.99$$

$$P(W_b|T_g) = 0.02$$

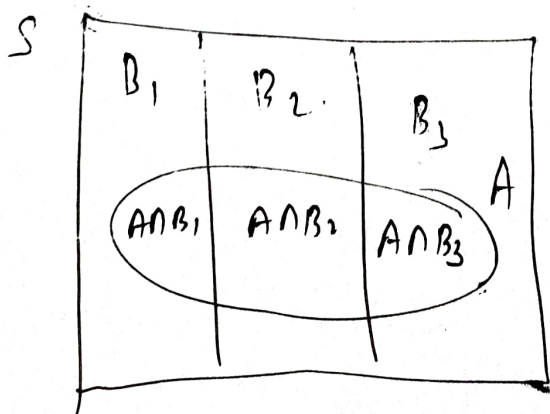
$$P(W_b) = P(W_b|T_b) \cdot P(T_b) + P(W_b|T_g) \cdot P(T_g)$$

$$= 0.99 \times 0.01 + 0.02 \times 0.99$$

$$= 0.99 \times 0.03$$

$$P(T_b|W_b) = \frac{0.99 \times 0.01}{0.99 \times 0.03} = \frac{1}{3}$$

Total Probability:



Mutually Exclusive

$$A = (A \cap B_1) \cup (A \cap B_2) \cup (A \cap B_3)$$