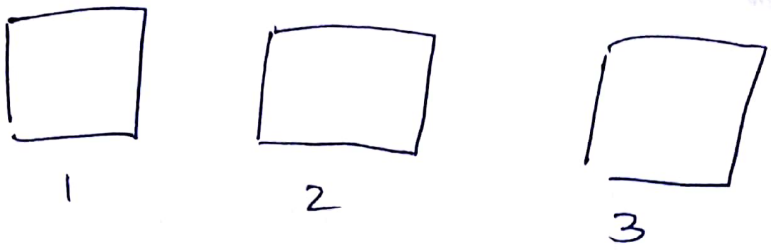
Monty Hall's problem.



1- ~~door~~ car

2- goats.

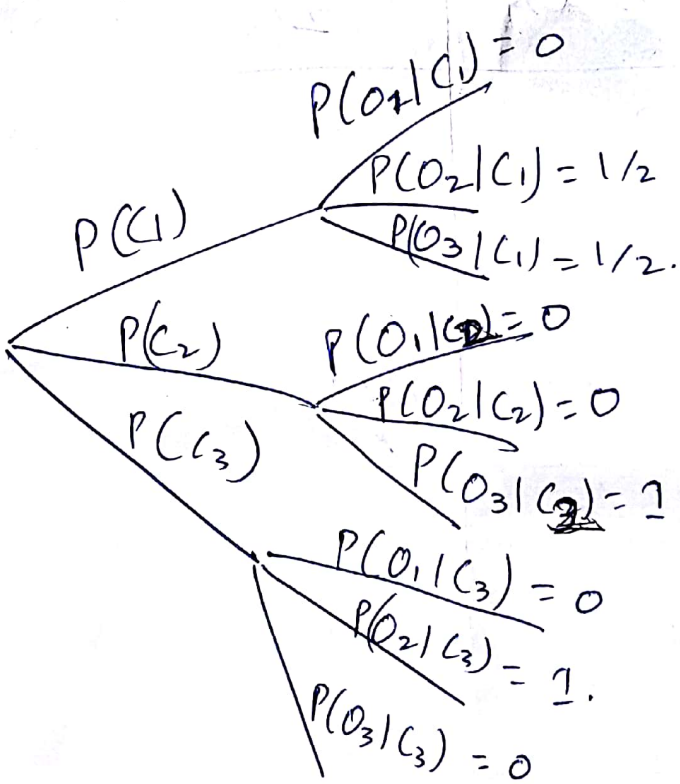
All doors equally likely.

Monty know what is behind what!!

Prior

$P(C_1) = 1/3$; $P(C_2) = 1/3$; $P(C_3) = 1/3$.

P(car behind door 1).



You have chosen door 1.
and host opens door 2.

$$P(C_1|O_2) = \frac{P(O_2|C_1) \times P(C_1)}{P(O_2|C_1) \times P(C_1) + P(O_2|C_2) \times P(C_2) + P(O_2|C_3) \times P(C_3)}$$

$$= \frac{1/2 \times \frac{1}{3}}{1/2 \times \frac{1}{3} + 0 + 1 \times \frac{1}{3}} = 1/3.$$

$$P(C_2|O_2) = \frac{P(O_2|C_2) \times P(C_2)}{P(O_2)} = 0$$

$$P(C_3|O_2) = \frac{P(O_2|C_3) \times P(C_3)}{P(O_2)}$$

$$= \frac{1 \times \frac{1}{3}}{\frac{1}{2}} = \frac{2}{3}.$$