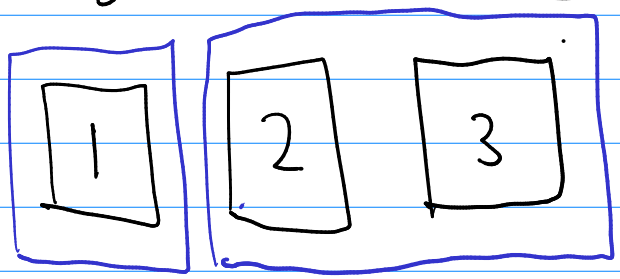
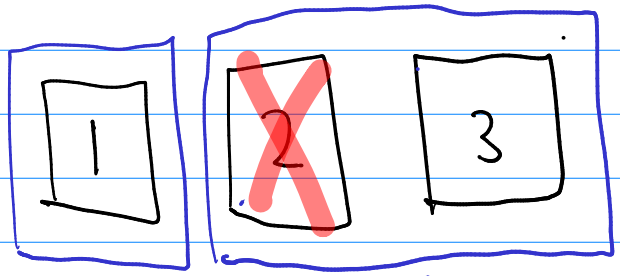
The Monty Hall Problem:



1/3 2/3



1/3 2/3

Doing rigorously:

A B C

Let my first choice be A

$$P(A = \text{Prize}) = \frac{1}{3}$$

The presenter chooses B.

$$P(B = \text{Prize}) = 0$$

$$P(A = \text{Prize} \mid B = \text{no prize}) = \frac{1}{3}$$

$$P(C = \text{Prize} \mid B = \text{no prize}) = \frac{P(C = \text{Prize} \text{ & } B = \text{no prize})}{P(B = \text{no prize})}$$

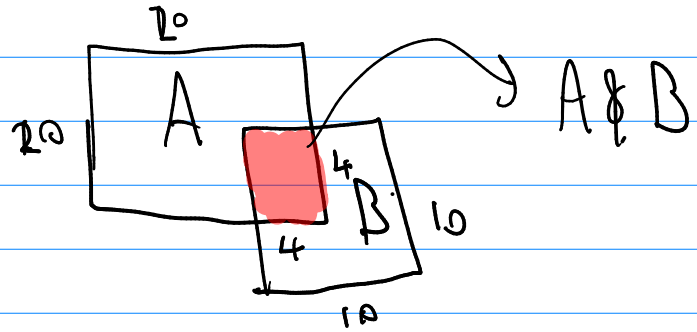
Bayes Theorem:

$$P(A|B) = \frac{P(B|A)P(A)}{P(B)}$$

$$P(C = \text{car} \mid B = \text{goat}) = \frac{P(B = \text{goat} \mid C = \text{car})\,P(C = \text{car})}{P(B = \text{goat})}$$

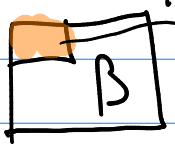
$$= \frac{1}{3}$$

TRY TO DO THIS!



$$P(A \& B) = \frac{4^2}{484}$$

$$S = 20^2 + 10^2 - 4^2 = 484$$



$$P(A|B) = \frac{4^2}{10^2}$$

$$P(A|B) = \frac{P(A \& B)}{P(B)} = \frac{4^2}{484} \times \frac{484}{100}$$

Q.4. 1 2 3 4 5 → What can I calculate?

1 2 3 4 5 $(0.2)^2(1-0.2)^3$

1 2 3 4 5 $(0.2)^2(1-0.2)^3$

$\binom{5}{2}(0.2)^2(1-0.2)^3$