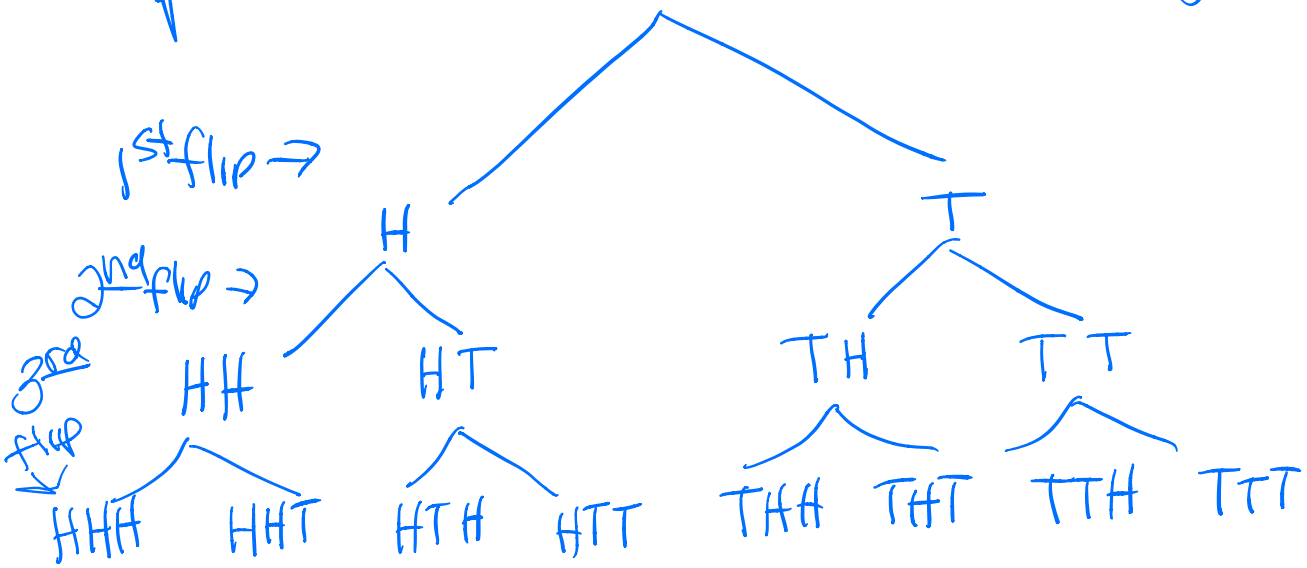
Word doc Lecture #6

Examples

4) Flip a coin 3 times. Want to list all possible outcomes. Create a tree diagram.

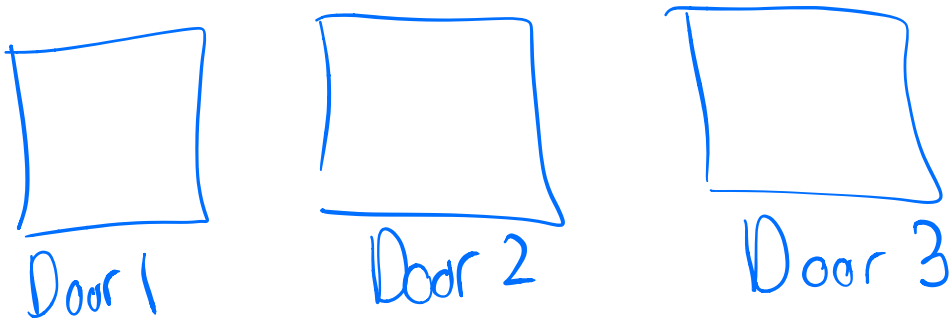


a) So the sample space for this experiment is $S = \{HHH, HHT, HTH, \boxed{HTT}, THH, \boxed{THT}, \boxed{TTH}, \boxed{TTT}\}$ (8 outcomes)

b) Event that tails occur more often than heads?

$A = \{HTT, THT, TTH, TTT\}$

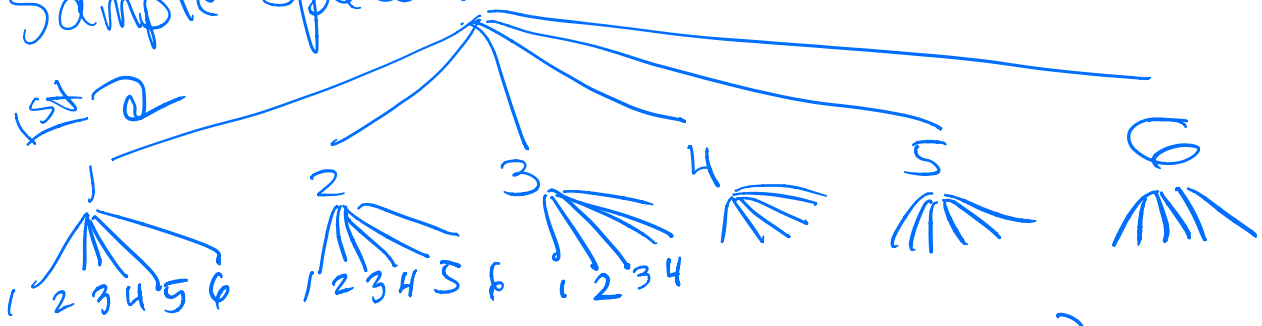
Probability Example:



Behind one door is a car
Behind the others are goats.
Monty asks you to choose a door. Monty then reveals what is behind one of the other doors. Monty now asks you: Do you want to stay with your original choice or switch?

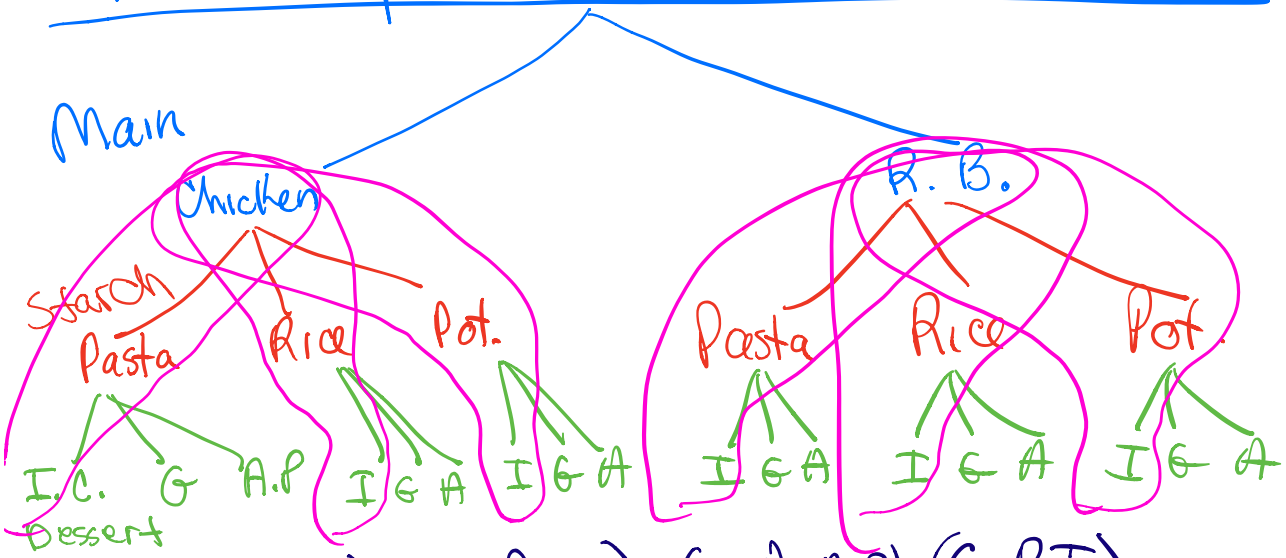
5) Roll 2 dice:

Sample Space:



$S = \{(1,1),(1,2),(1,3),(1,4),(1,5),(1,6),(2,1)\ldots\ldots\}$

You solve parts b) & c)!



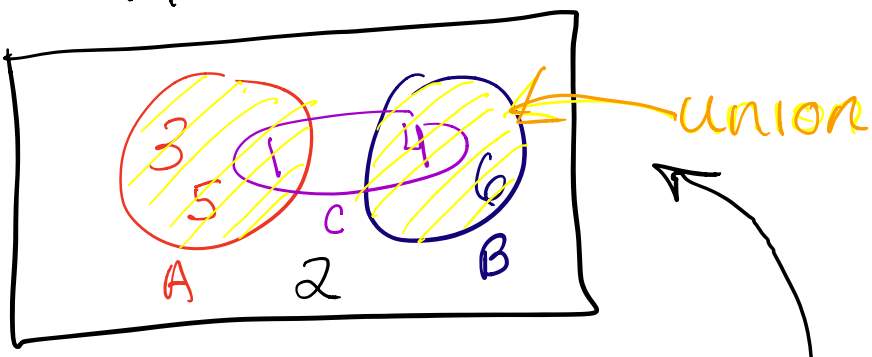
$S = \{(Ch, Pas, I), (C, Pas, G), (C, B, A.P), (C, R, I), \ldots\ldots$

a) $2 \times 3 \times 3 = 18$ outcomes $\ldots\ldots (R.B, Pot, A)\}$

b) A = ice cream is chosen $= \{$(Chick, Pasta, I.C), (Chicken, Rice, I.C.), (Ch, Pot, I.C), (R.B, Pasta, I.C) (R.B, Rice, I.C), (R.B, Pot., I.C)$\}$

Venn Diagrams:

Ex $S=\{1,2,3,4,5,6\}$, $A=\{1,3,5\}$, $B=\{4,6\}$, $C=\{1,4\}$



Find

a) $A \cup B = \{1,3,4,5,6\}$

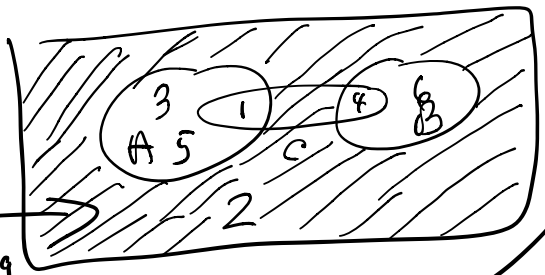
↑ "union"

you do "or"

b) $+C$)! Have fun :)!

d) $(A \cup B)^c$ ← complement

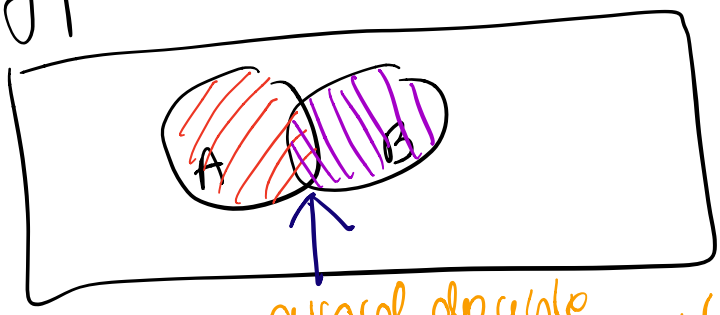
$=\{2\}$



complement

shade everything outside of yellow $(A \cup B)$

Counting principles:



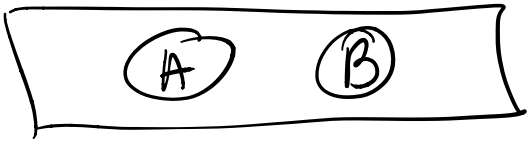
avoid double counting!!

For any sets A & B:

$n(A \cup B) = n(A) + n(B) - n(A \cap B)$

↑ intersection

If A & B are disjoint → no worries



$n(A \cup B) = n(A) + n(B)$

Ex Survey 1000 people

310 stocks = S

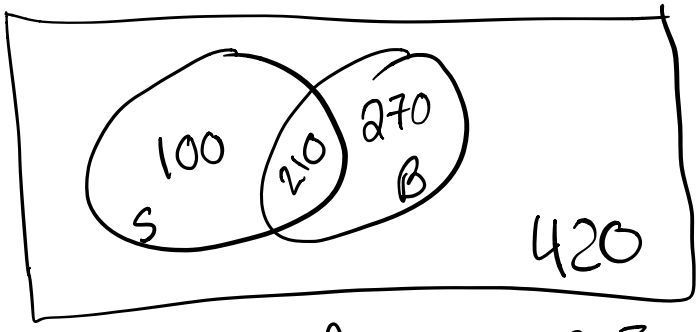
480 bonds = B

210 stocks + bonds

$1000-(100+210+270)$

$= 1000-580$

$= 420$



a) How many invested in S ∪ B? $= 100+210+270$

"or" "union"

$= \underline{580}$

b) neither stocks nor bonds = saying "not or"

$\neg(S \cup B)$ also say $(S \cup B)^c$

"not" complement

$= \underline{420}$

c) Bonds but <u>not</u> stocks? <u>270</u>