Counting / Probability

a random process

sample space

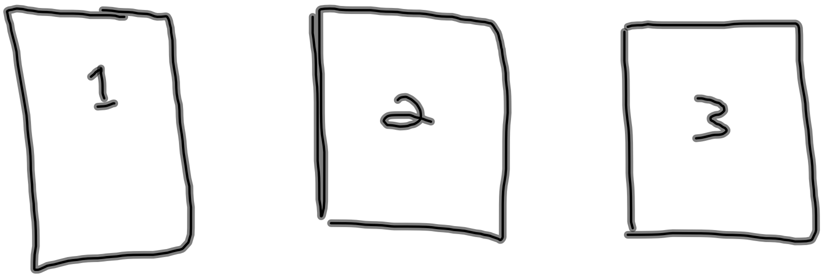
event

Probability of an event $P(E)$

all outcomes equally likely

$$P(E) = \frac{\text{the number of outcomes in } E}{\#\text{ outcomes in the sample space}}$$

Monty Hall Problem



Chosen Door 1:

cases: prize is behind	stay	switch
1	✓	✗
2	✗	✓
3	✗	✓

If m, n are integers and $m \le n$, then there are $n - m + 1$ integers from m to n inclusive.

How many 3 digit numbers are divisible by 3?

$100, 101, 102, 103, 104, 105, \ldots\ldots 996, 997, 998, 999$

$102 = 3 \cdot 34$, $105 = 3 \cdot 35$, $996 = 3 \cdot 332$, $999 = 3 \cdot 333$

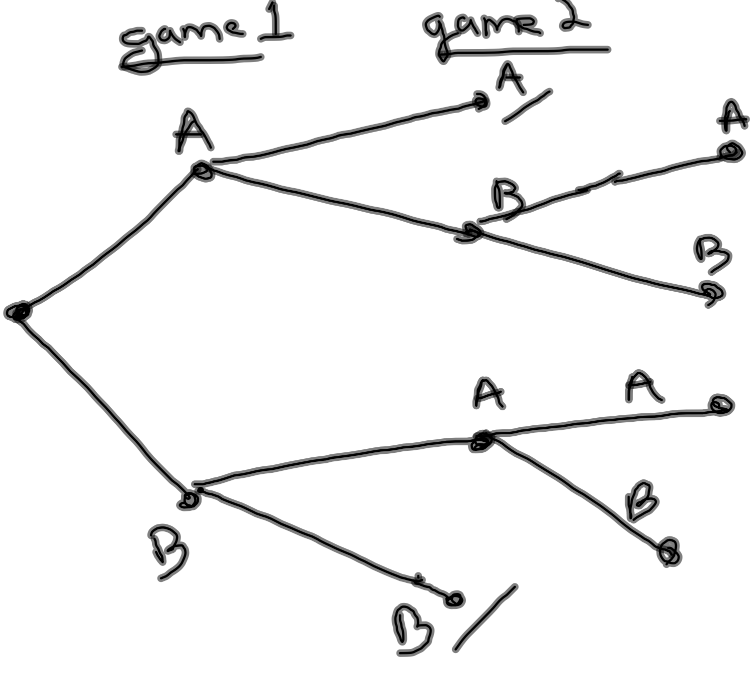
$34 \ldots 333$

$333 - 34 + 1 = 300$

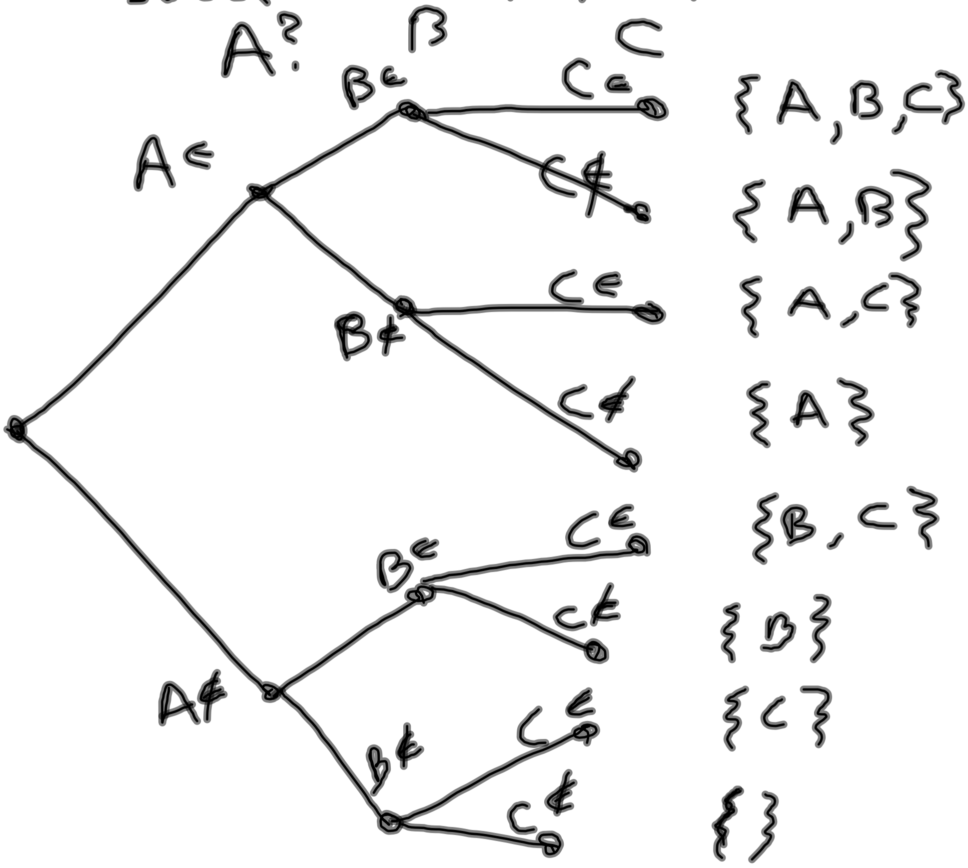
Possibility Trees

Best of 3 tournament

between A, B



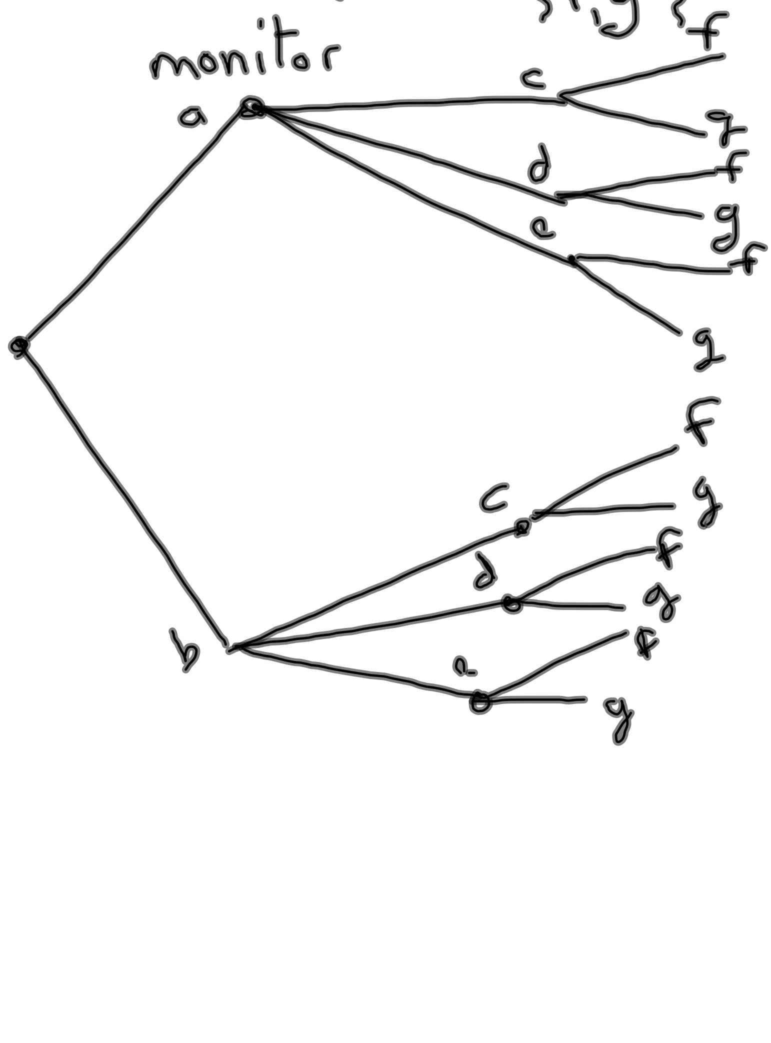
subsets of {A, B, C}



2 monitors $\{a, b\} = M_0$

3 keyboards $\{c, d, e\} = K$

2 mice $\{f, g\} = M_1$



$M_0 \times K \times M_1$

If an operation consists of k steps and ~~for~~ each step i can be performed in n_i different ways

The entire operation can be done in $n_1 \cdot n_2 \cdot n_3 \cdots \cdot n_k$ ways.

identifiers

size

$\{A..Z, a..z, \_, 0..9, \$\}$ 64

first char $\{$ " " " $\times$ " $\}$ 54

# of identifiers of length 4

$54 \cdot 64 \cdot 64 \cdot 64$ = a lot

> 14 million

14, 155, 776