$m, n \in \mathbb{Z} \qquad m \leq n$

$n - m + 1$ integers in the list from m to n

$3, 4, 5, 6, 7, 8, 9, 10$

$10 - 3 + 1 = 8$

How many 3 digit #'s are divisible by 3?

100, 101, 102, 103, 104, 105, 106, ..., 999

$3 \cdot 34$ $3 \cdot 35$ $3 \cdot 333$

34, 35, 36, ... 333

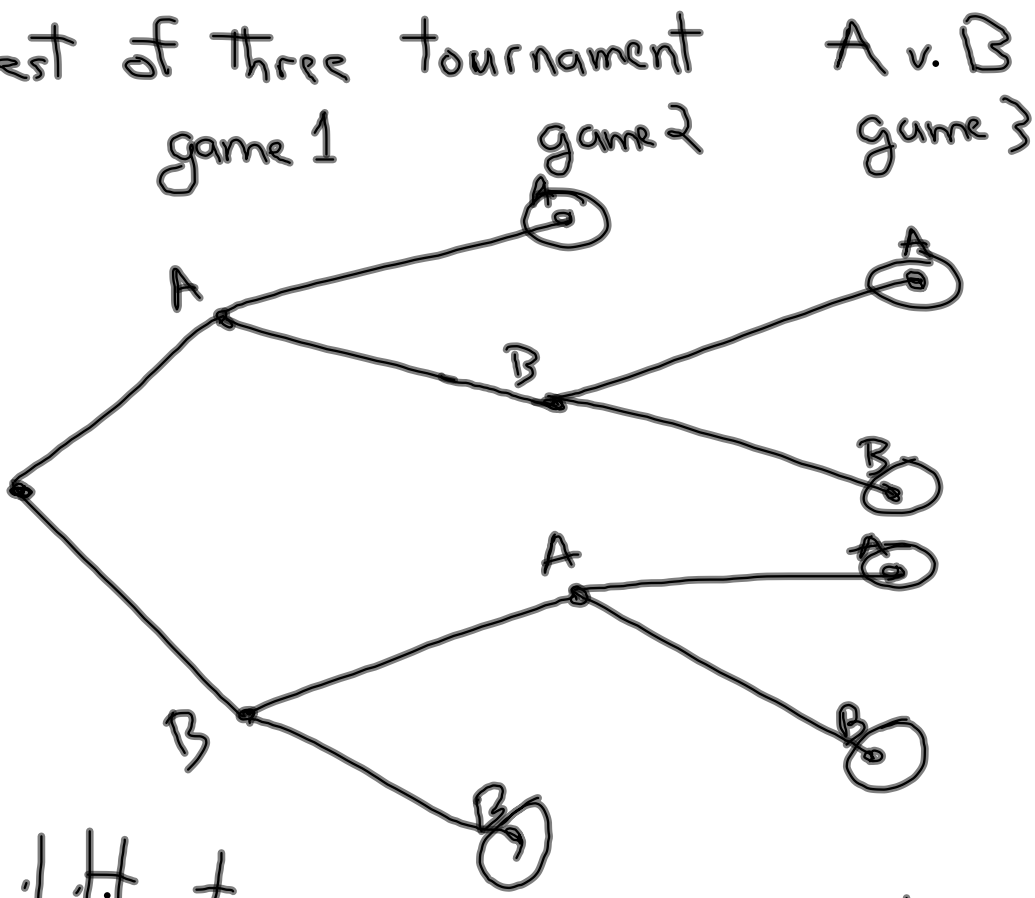
total $= 333 - 34 + 1 = 300$

probability that a 3 digit # is divisible by 3

div by 3 $\rightarrow \frac{300}{(999-100+1)} = \frac{300}{900} = \frac{1}{3}$

# of 3 digit #s

Best of three tournament A v. B



Possibility tree

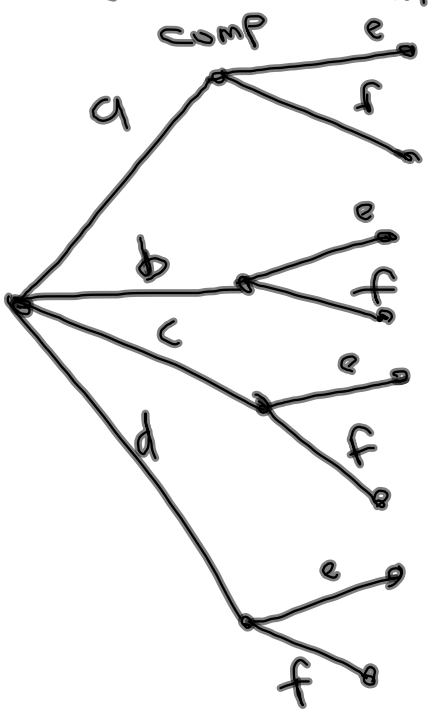
6 different outcomes

2 end in game 2

$$\frac{2}{6} = \frac{1}{3}$$

4 computers
$C = \{a, b, c, d\}$

2 monitors
$M = \{e, f\}$



$C \times M =$

$\{(a,e), (a,f), (b,e), (b,f), (c,e), (c,f), (d,e), (d,f)\}$

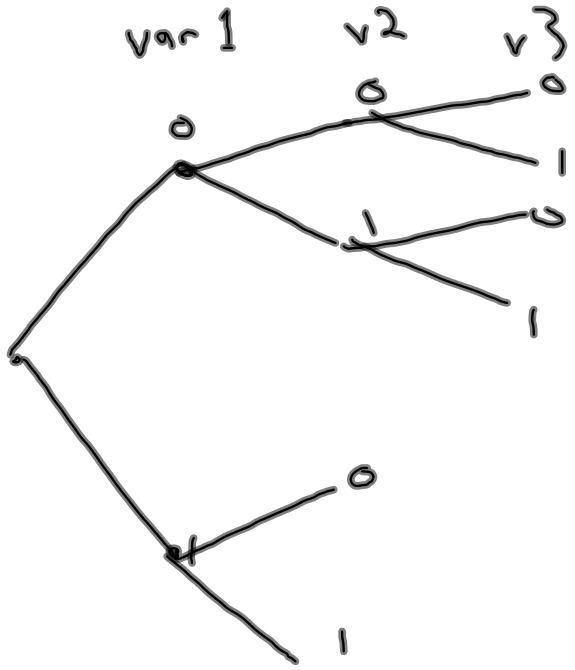
Multiplication Rule

an operation consists of k steps

for each step i, step i can be performed in n_i ways

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

Truth Table of n-variables?



$2 \cdot 2 \cdot 2 \cdot \cdots 2 = 2^n$

Identifiers

- char, numbers, _
- starts w/ char, -

1st char $\{a..z, A..Z, \_\}$ 53

after $\{a..z, A..Z, \_, 0..9\}$ 63

ident. of length 3

$53 \cdot 63 \cdot 63$

~~2 var~~

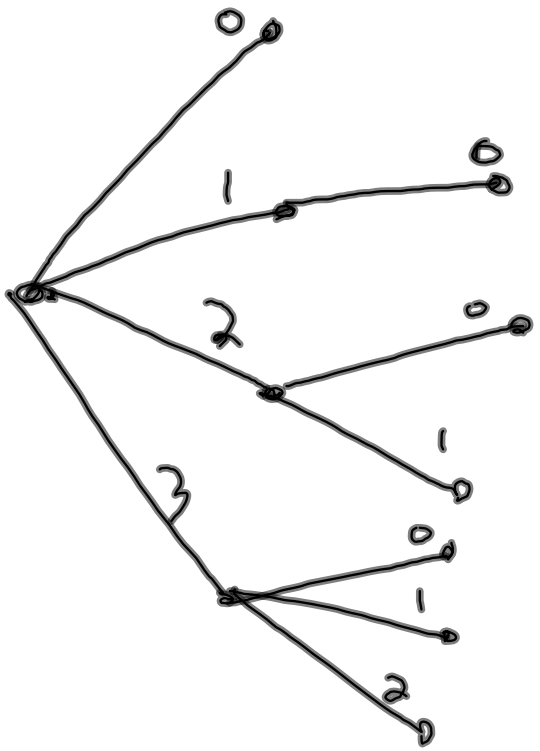
2L

2f

```
for (int i = 0; i < 4; i++)
    for(int j=0; j<3; j++)
        print('x');
```

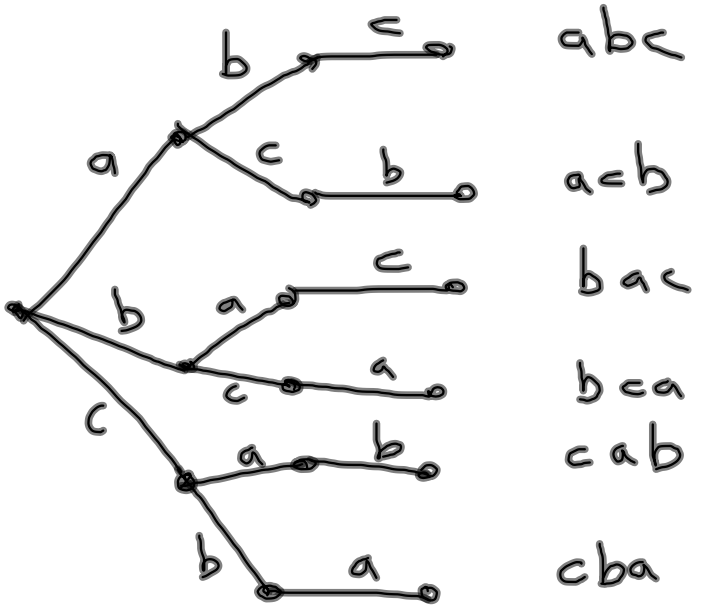
12 x's

```
for(int i = 0; i<4; i++)
    for(int j=0; j<i; j++)
        print('x');
```



6 x's

$A = \{a, b, c\} = \{b, a, c\} = \ldots$



permutations of A

$3 \cdot 2 \cdot 1 = 6$

for a set w/ n items

first item · second · 3rd

$n \cdot (n-1) \cdot (n-2) \cdots 2 \cdot 1$

$= n!$

$A = \{a, b, c\}$

strings of length 2

$3 \cdot 2$

$\{ab, ac, ba, bc, ca, cb\}$

2-permutation of A