1st Toss

3 Tosses

UNFAIR

2 Tosses

12/4/19 P1
N = 4 dinner choices

Choose 2 nights w/ replacement. Want probability that choices are different.

\[
\begin{align*}
&AA &AB &AC &AD \\
&CA &CB &CD \\
&DA &DB &DC &DD
\end{align*}
\]

\[
\frac{12}{16}
\]

\[
\# \text{choices} = N^2 = 4^2 = 16
\]

\[
\# \text{w/o replacement} = N(N-1) = 4 \cdot 3 = 12
\]

\[
p = \frac{12}{16}
\]
PERMUTATIONS OF 3 OBJECTS

ABC, ACB

BAC, BCA

CAB, CBA

6 = 3!

Book Ex 2.20 N=5 OBJECTS A B C D E
NECK-2 w/o ORDER w/o REPL.

2 \binom{5}{2} \binom{2}{2} \binom{1}{1} \frac{(n-1)!(m_1)...(m_k)!}{k!}

COMBINATIONS

AB, AC, AD, AE, BC, BD, BE, CD, CE, DE

10 \binom{10}{5} \binom{5}{4} \binom{1}{2}
\[
\binom{n(n-1)\ldots(n-k+1)}{\binom{n}{k}} = \binom{n}{k}
\]

\[
\binom{n}{k} = \frac{n!}{k!(n-k)!} = C_k^n
\]

# Choices w/o repl, w/o order
Choosing \(k\) from \(n\) different balls

# Permutations = \(n(n-1)\ldots(n-k+1)\)

\[
\frac{n!}{\binom{n}{k}!} = \binom{n}{k}
\]

Book Ex. 2.21

# Permutations of \(k\) pennies and \(n-k\) nickels

\[
\frac{n!}{k!(n-k)!} = \binom{n}{k}
\]
2 of 5 parts are bad.
- Pick 1. Prob it's bad? $p = .4$
- Pick 2. Prob both bad? $p = .16$
- Pick 3. All? $p = 0$

$N = 9$ coins

$K_1 = 1$
$K_2 = 1$
$K_3 = 3!$
$K_4 = 3$
$K_5 = 3$

$\text{# perm} = 9!$

$3,628,800 \div 10,800 = 336$

$6.6$