Statistics

Lecture 12

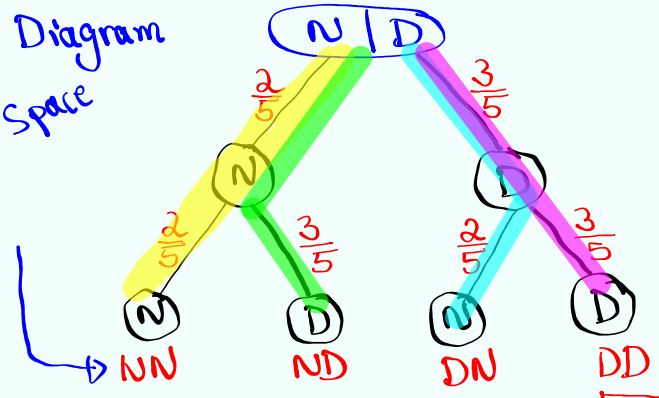
Feb 19-8:47 AM

A piggy bank has 2 Nickels & 3 Dimes.

Take 2 Coins with replacement.

Tree Diagram

Sample Space



NN → 10 ¢ $P(10¢) = \frac{2}{5} \cdot \frac{2}{5} = \frac{4}{25} = .16$

ND
DN → 15 ¢ $P(15¢) = 2 \cdot \frac{2}{5} \cdot \frac{3}{5} = \frac{12}{25} = .48$

DD → 20¢ $P(20¢) = \frac{3}{5} \cdot \frac{3}{5} = \frac{9}{25} = .36$

Apr 6-11:05 AM

Total ¢	P(Total ¢)
10¢	.16
15¢	.48
20¢	.36

clear all lists

Total → L1

P(Total) → L2

STAT → CALC

1:1-Var Stat

List : L1

Freq List: L2

Calculate

$\bar{x} = 16$

$S = S_x = $ Blank

$n = 1$

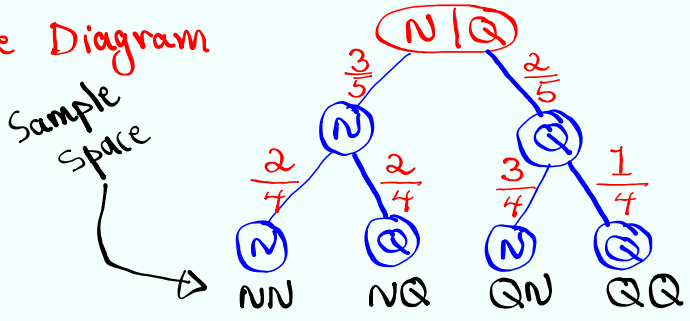
Total Prob.

Apr 8-10:06 AM

A piggy bank has 3 Nickels and 2 Quarters.

Take 2 coins with No replacement.

Tree Diagram



NN → 10¢ $\quad P(10¢) = \frac{3}{5} \cdot \frac{2}{4} = \frac{6}{20} = .3$

NQ, QN → 30¢ $\quad P(30¢) = 2 \cdot \frac{3}{5} \cdot \frac{2}{4} = \frac{12}{20} = .6$

QQ → 50¢ $\quad P(50¢) = \frac{2}{5} \cdot \frac{1}{4} = \frac{2}{20} = .1$

Apr 8-10:13 AM

Total ¢	P(Total ¢)
10¢	.3
30¢	.6
50¢	.1

$\bar{x} = 26$

$S = S_x = \text{Blank}$

$n = 1$

Clear all lists

Total → L1

P(Total) → L2

STAT →

CALC

1: 1-Var Stats

List: L1

freqList: L2

Calculate

Apr 8-10:22 AM

3 Females 5 males

Form a group of 3 people. no replacement

sample space

FFF

Some F & Some M

MMM

$P(3\ \text{Females}) = \frac{3}{8} \cdot \frac{2}{7} \cdot \frac{1}{6} = \frac{1}{56}$

$P(3\ \text{Males}) = \frac{5}{8} \cdot \frac{4}{7} \cdot \frac{3}{6} = \frac{5}{28}$

Total Prob.

$P(\text{at least 1 Female}) = 1 - P(\text{No Female})$

$= 1 - P(MMM)$

$= 1 - \frac{5}{28} = \boxed{\frac{23}{28}}$

$P(\text{at least 1 male}) = 1 - P(\text{No male})$

$= 1 - P(\text{all Females})$

$= 1 - \frac{1}{56} = \boxed{\frac{55}{56}}$

Apr 8-10:27 AM

Conditional Prob.:

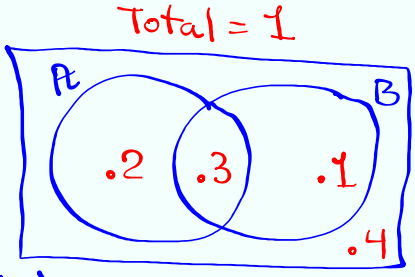
$$P(B \mid A) = \frac{P(A \text{ and } B)}{P(A)}$$

Given

$P(A) = .5$

$P(B) = .4$

$P(A \text{ and } B) = .3$



$$P(B \mid A) = \frac{P(A \text{ and } B)}{P(A)} = \frac{.3}{.5} = \frac{3}{5} = .6$$

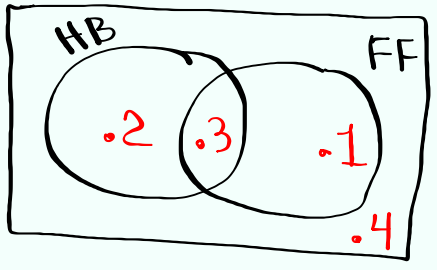
$$P(A \mid B) = \frac{P(A \text{ and } B)}{P(B)} = \frac{.3}{.4} = \frac{3}{4} = .75$$

Apr 8-10:40 AM

$P(HB) = .5$

$P(FF) = .4$

$P(HB \text{ and } FF) = .3$



$$P(FF \mid HB) = \frac{P(HB \text{ and } FF)}{P(HB)} = \frac{.3}{.5} = .6$$

$$P(HB \mid FF) = \frac{P(HB \text{ and } FF)}{P(FF)} = \frac{.3}{.4} = .75$$

Apr 8-10:50 AM

$P(\text{Shirt}) = .6$

$P(\text{pants}) = .4$

$P(\text{Pants} \mid \text{Shirt}) = .5$

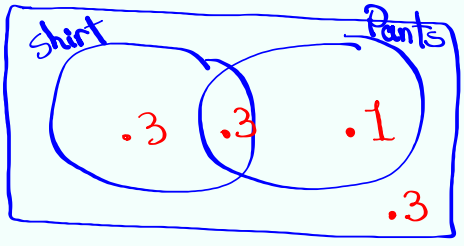
$P(\text{Shirt and Pants})$

$P(\text{Pants} \mid \text{Shirt}) = \frac{P(\text{Shirt and Pants})}{P(\text{Shirt})}$

$.5 = \frac{P(\text{Shirt and Pants})}{.6}$

Cross-Multiply

$P(\text{Shirt and Pants}) = .3$



$P(\text{Shirt} \mid \text{Pants}) = \frac{.3}{.4}$

$= .75$

Work on SG 10 - 13 ✓

Apr 8-10:54 AM