Statistics

Lecture 27

Feb 19-8:47 AM

Complete the chart below

x	$P(x)$	$x\,P(x)$	$x^2P(x)$
2	.3	.6	1.2
3	.6	1.8	5.4
4	.1	.4	1.6

1) Verify $\sum P(x)=1$

2) $\mu=\sum xp(x)$
$=.6+1.8+.4=\boxed{2.8}$

3) $\sum x^2p(x)=\boxed{8.2}$

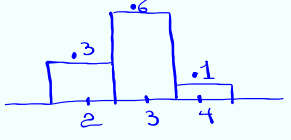
4) $\sigma^2=\sum x^2p(x)-\mu^2$
$=8.2-2.8^2=\boxed{.36}$

5) $\sigma=\sqrt{\sigma^2}=\sqrt{.36}=\boxed{.6}$

VARS | 5: Statistics
4: σx | x^2 | Enter
$\sigma^2=.36$
Math | 1: ▶Frac | Enter
$\frac{9}{25}$

$x\to L1$, $P(x)\to L2$
Use 1-Var Stats
with L1 & L2
$\mu=\bar{x}=2.8$
$\sigma=\sigma x=.6$
$n=1$ ✓

Draw Prob. Dist. Histogram



$x\to$ Midpt
$P(x)\to$ Rel. F.

Oct 15-8:54 AM

Consider the chart below

x	P(x)
1	.15
2	.25
3	.35
4	.25

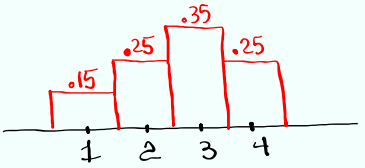
1) Find P(x=1)

$= 1 - [.25 + .35 + .25]$ ← Total Prob.

$= .15$

2) $P(x=2 \text{ or } x=3) = .25 + .35 = .6$

3) Draw Prob. dist. histogram



$x \to L1$, $P(x) \to L2$

Use 1-Var Stats with L1 & L2 to find

$\mu = \bar{x} = 2.7$

$\sigma = \sigma_{\bar{x}} \approx 1.005$

$n = 1$ ✓

VARS → 5: Statistics → 4: $\sigma_{\bar{x}}$

$\sigma^2 = \frac{101}{100}$

x^2 MATH 1:▶Frac Enter σ^2 (Reduced Fraction)

Oct 15-9:04 AM

I am selling 25 TKTS for $10 each.

One ticket will be drawn.

Winner gets a Calc. worth $100.

25 TKTS ($10 each) = $250

I give away a Calc = $100

Net profit = $150

Expected Value Per TKT → Net profit per TKT $= \frac{\$150}{25} = \$6$

Net	P(Net)	
10 − 100	$\frac{1}{25}$	I lose
10 − 0	$\frac{24}{25}$	I win

Net → L1

P(Net) → L2

Expected Value

$\mu = \bar{x} = \$6$

1-Var Stats

use L1 & L2

Oct 15-9:13 AM

I paid $50 to insure my luggage.

Airline would have paid me $500 for any damages.

Prob. of any damage is .02.

Find expected value per policy sold by airline.

Net	P(Net)
50 − 500	.02
50 − 0	.98

Net → L1

Damage P(Net) → L2

E.V. = $\mu = \bar{x}$

Damage

$40

1-Var Stats with L1 & L2

Oct 15-9:20 AM

Pay me $5

Draw one card from a full-deck of playing cards

If you draw Ace, I give you $20

" " " face, " " " $10

Any other card, I give you nothing

Net	P(Net)	
5 − 20	4/52	Ace
5 − 10	12/52	face
5 − 0	36/52	any other card

L1 L2

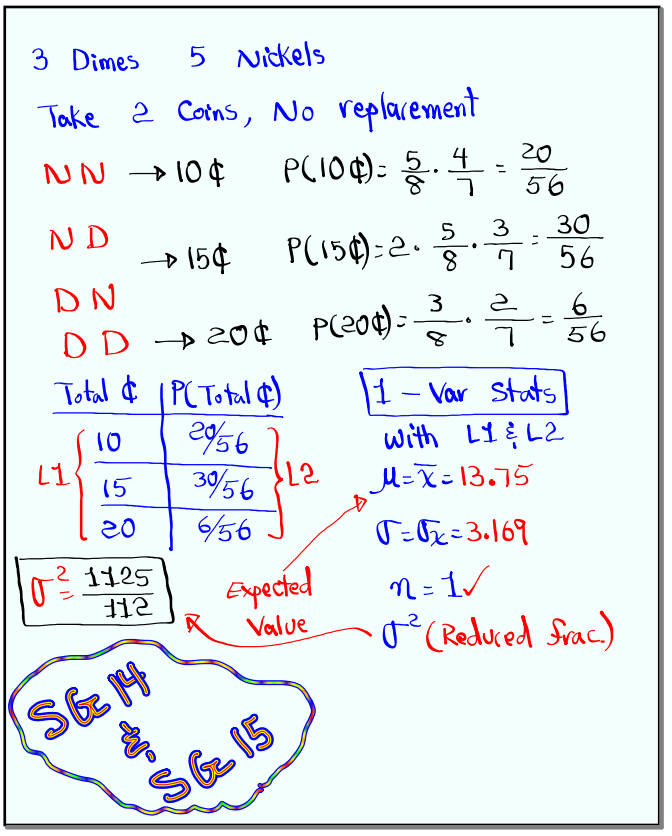
Expected value per bet for the house

E.V. = $\mu = \bar{x}$

1-Var Stats with L1 & L2

$\approx$ $1.15

Oct 15-9:26 AM


3 Dimes 5 Nickels
Take 2 Coins, No replacement
NN → 10¢ P(10¢) = 5/8 · 4/7 = 20/56
ND → 15¢ P(15¢) = 2 · 5/8 · 3/7 = 30/56
DN
DD → 20¢ P(20¢) = 3/8 · 2/7 = 6/56
Total ¢ | P(Total ¢)
10 | 20/56
15 | 30/56
20 | 6/56
L1
L2
1 – Var Stats
with L1 & L2
μ = x̄ = 13.75
σ = σx = 3.169
n = 1 ✓
σ² (Reduced Frac.)
σ² = 1125/112
Expected Value
SGH & SGH

Oct 15-9:32 AM