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Intermediate Statistics – 90-777
Assignment 2

1.)

	N		Mean
Asian	127	x	0.1654 = 21.0058
Black	66	x	0.2727 = 17.9982
Hispanic	14	x	0.0714 = 0.9996
Indian	56	x	0.1607 = 8.9992
Other	20	x	0.1000 = 2
White	331	x	0.2447 = 80.9957
Total	614		131.9985

P = 0.215

2.) (a.) No training: $0*.1 + $8*.5 + $12*.2 + $18*.2 =

0 + 4 + 2.4 + 3.6 = $10/hr

Training: $0*.15 + $8*.35 + $12*.15 + $18*.35 =

0 + 2.8 + 1.8 + 6.3 = $10.90/hr

Difference: $0.90/hr more for those with training, suggesting that job training is effective in increasing wages.

(b.) Probability of employment with training: 0.85

Probability of employment without training: 0.9

No, these probabilities suggest training is NOT effective in increasing the chances of being employed.

(c.) .35 + .15 + .35 = 0.85

$8*(.35/.85) + $12*(.15/.85) + $18*(.35/.85) =

8*0.41176 + 12*0.17647 + 18*0.41176 =

3.29 + 2.12 + 7.41 = **$12.82/hr**

(d.) 0.3*0.15 + 0.7*0.1 = 0.045 + 0.07 = **0.115**

3.) a.)

(1/3 chance that it's the coin picked up, since it can't be the 2x headed coin) * (1/3 chance it will flip to a tail) / (chance of getting tails with any of the 3 coins- not 2x headed)

$$\frac{(1/3 * 1/3)}{(1/3*0.5 + 1/3*0.5 + 1/3*1/3)} = \frac{1/9}{4/9} = \mathbf{¼\ or\ 0.25}$$

b.)

(2/3 chance it's fair, since it cannot be the double headed coin) * (1/2 P heads) * (1/2 P tails) divided by the P of getting heads then tails with all coins (except 2x)

$$\frac{2/3 * 1/2 * 1/2}{(2/3 * 1/2 * 1/2) + (1/3*2/3*1/3)} = \frac{2/12}{1/6 + 2/27} = \frac{1/6}{9/54 + 4/54} = \frac{1/6}{13/54} = \mathbf{9/13}$$

4.) a.)

Manager 1:

μ = (5000+45000)/2 = **25000**

σ = (45k-5k)/ √12 = **11547.005**

Manager 2:

μ = **21000**

σ = **3000**

Manager 3:

μ = 15k*0.2 + 20k*0.4 + 25k*0.3 + 30k*0.1

= 3k + 8k + 7.5k + 3k

= **21500**

σ = √((15k-21.5k)^2*0.2 + (20k-21.5k)^2*0.4 + (25k-21.5)^2*0.3 + (30k-21.5k)^2*0.1)

= √ (8450000 + 900000 + 3675000 + 7225000)

= √ 20250000

= **4500**

b.) i.) between $17k-$24k

Manager 1: (24k-17k)/(45k-5k) = 7k/40k = **0.175**

Manager 2: Area of 17k-21k + Area of 21k-24k

A1 : z = 1.33, so A1 = 0.4082

A2: z = 1, so A2= 0.3413

A1 + A2 = **0.7495**

Manager 3: P($20k) = **0.4**

ii.) >$22k

Manager 1: (45k-22k)/40k = 23k/40k = **0.575**

Manager 2: 0.5 - Area of 21k-22k

A1: z = 0.3333, so A1 = 0.1293

0.5 – 0.1293 = **0.3707**

Manager 3: P($25k) + P($30k) = 0.3 + 0.1 = **0.4** iii.) <$18k

Manager 1: (18k-5k)/40k = 13k/40k = **0.325**

Manager 2: 0.5 – Area from 21k-18k

A: z= 1, so A = 0.3413

0.5-0.3413

= **0.1587**

Manager 3: P($15k) = 0.2

iv.) exactly $25k

Manager 1: **0**

Manager 2: **0**

Manager 3: P($25k)= **0.3**

c.)

Manager 1: l*w = 0.85

l*(1/40000) = 0.85

l = **34000**

Manager 2: z= 1.04 = (x -21000) / 3000

3120 = x – 21000

x = **24120**

Manager 3: **$25000 (the probability of being over budget will only be 0.1)**

5.)

a.) $\mu = np = 1000 * 0.02 =$ **20**

$\sigma = \sqrt{(n*p*q)} = \sqrt{(1000*0.98*0.02)} = \sqrt{(19.6)} =$ **4.427**

b.) EV = Revenue from good chips - cost to produce defective chips – cost of sold defective chips

= .98(1000)*($3000-100) + .02(1000)(-$100) + .02(1000)*0.01(-$5000000+$3000)

= $2842000 - $2000 - $999,400

=**$1,840,600**

c.)EV = .98(1000)*($3000-100) + .02(1000)(-$100)

= 2840000 – 1840600

= $999,400 increase in Expected Profit