Correcting HW1

1.2.10) On part b, I missed up calculating the standard deviation. The correct way to solve the problem is:

$$S^2 = \frac{1}{99}\left(70(1-1.52)^2 + 15(2-1.52)^2 + 10(3-1.52)^2 + 3(4-1.52^2) + 2(5-1.52)^2\right) \approx 0.8784$$

$$S = \sqrt{0.8784} = 0.9372$$

HW2

2.1.2 a. $S = (1,1,1,2,2,3)$

b. There are 3 1's and 1 3, and all are equally likely to show up, so the probability of an odd number is $\frac{4}{6}$ or $\frac{2}{3}$

c. The sample space isn't based on the probability of each outcome, so it wouldn't change

d. Yes it would change

$$P(1) + P(3) = \frac{3}{7} + \frac{2}{7} = \frac{5}{7}$$

2.1.12 $P(V) = .15$, $P(W) = 0.05$, $P(V \cup W) = .17$

a) $P(V \cap W) = P(V) + P(W) - P(V \cup W)$
$.15 \quad .05 \quad .17 \quad = .03$

b) $1 - P(V \cup W)$
$1 - .17 = .83$

c) $P(V) - P(V \cap W)$
$.15 - .03 = .12$

2.1.14 600 total 15 cracked 27 discolored
562 perfect

a) $P(C \cup D)$
$1 - \frac{562}{600} = \frac{38}{600}$

b) $P(C \cap D) = P(C) + P(D) - P(C \cup D)$
$\frac{15}{600} \quad \frac{27}{600} \quad - \frac{38}{600}$

$\frac{4}{600}$

c) $P(C) - P(C \cap d)$

$\frac{15}{600} - \frac{4}{600} = \frac{11}{600}$

2.3.10

50% engineering 20% club sports

10% both

a) $P(e) = .3$

b) $P(c) = .2$

c) $P(c|e) = \frac{P(c \cap e)}{P(e)} = \frac{.1}{.3} = \frac{1}{3}$

d) $P(e|c) = \frac{P(c \cap e)}{P(c)} = \frac{.1}{.2} = \frac{1}{2}$

e) $1 - P(c|e) = 1 - \frac{1}{3} = \frac{2}{3}$

f) $1 - P(e|c) = 1 - \frac{1}{2} = \frac{1}{2}$

2.3.14

$P(L) = .5 \quad P(P) = .3$

a) $P(L \cup P) = P(L) + P(P) - P(L \cap P)$

$P(L \cap P) = .5 \cdot .3 = .15$

$.5 + .3 - .15 = .65$

b) $P(L \cap P^c) + P(L^c \cap P)$

$P(L \cap P^c) = (.5)(1-.3) = .35$

$P(L^c \cap P) = (1-.5)(.3) = .15$

$.35 + .15 = .5$

c) $P(L \mid \text{one hit}) = \frac{P(L \cap P^c)}{.5}$

$\frac{.35}{.5} = .7$

2.3.18

a) $\frac{71}{340}$ b) $\frac{86}{214}$ c) $\frac{22}{120}$

d) $\frac{22}{91}$ e) total $= 290 + 120 = 410$

$410 - 105 - 40 = 265$

$\frac{265}{410}$

2.3.26

$P(S) = .75 \quad P(E) = .25$

$P(N|S) = .8 \quad P(N|E) = .95$

a) $P(E \cap N) = P(E)P(N|E)$

$(.25)(.95) = .2375$

b) $P(N) = P(S)P(N|S) + P(E)P(N|E)$

$.6 + .2375$

$.8375$

c) $P(E|N) = \frac{P(E \cap N)}{P(N)} = \frac{.2375}{.8375}$

$= .2836$

9) I think that the POP quizzes could be worth extra participation points for small amounts of extra credit. I think that the current system of not posting notes or recordings is flawed. There will always be times where people have to miss class, and without lecture material posted it's forcing them to fall behind