Jerry Chen

CS513

Homework 1

1.1

Jerry and Susan have a joint bank account. Jerry goes to the bank 20% of the days. Susan goes there 30% of the days. Together they are at the bank 8% of the days.

a) $P(J|S) = \frac{0.08}{0.3} = 0.2667$

b) $P(J|!S) = \frac{0.12}{0.7} = 0.171$

c) $P(J \cap S|J \cup S) = \frac{0.08}{0.42} = 0.19$

1.2

Harold and Sharon are studying for a test. Harold's chances of getting a "B" are 80%. Sharon's chances of getting a "B" are 90%. The probability of at least one of them getting a "B" is 91%.

a) $P(H \cap !S) = 0.01$

b) $P(!H \cap S) = 0.11$

c) $P(!H \cap !S) = 0.09$

1.3

No, the events "Jerry is at the bank" and "Susan is at the bank" are not independent.

1.4

You roll 2 dice.

a) The events "the sum is 6" and "the second die shows 5" are not independent.

b) The events "the sum is 7" and "the first die shows 5" are independent.

1.5

An oil company is considering drilling in either TX, AK, or NJ. The company may operate in only one state. There is 60% chance the company will choose TX and 10% chance –NJ. There is 30% chance of finding oil in TX, 20% -in AK, and 10% -in NJ.

a) $P(Oil) = P(TX)P(Oil_{TX}) + P(AK)P(Oil_{AK}) + P(NJ)P(Oil_{NJ}) = (0.6)(0.3) + (0.3)(0.2) + (0.1)(0.1) = 0.25$

b) $P(TX|Oil) = \frac{0.18}{0.25} = 0.72$

1.6

a) P(Passenger not survive) = Passengers dead/Total Passengers= 1490/2201 = 0.677

b) P(First Class) = 325/2201 = 0.148

c) P(First Class|Survived) = 203/711 = 0.286

d) No, survival and staying in the first class are not independent.

e) P(First Class and Child|Survived) = 6/711 = 0.008

f) P(Adult|Survived) = 654/711 = 0.92

g) No, age and staying in the first class given that a passenger survived is not independent.