Theodore Jagodits HW01 CS 513

**1.1**

|  |  |  |  |
| --- | --- | --- | --- |
|  | Susan @ Bank | Susan ! @ Bank |  |
| Jerry @ Bank | 0.08 | 0.12 | 0.20 |
| Jerry ! @ Bank | 0.22 | 0.58 | 0.80 |
|  | 0.30 | 0.70 |  |

1. P (Jerry @ Bank | Susan @ Bank) = 0.08 / 0.30 = 0.2667
2. P (Jerry @ Bank | Susan ! @ Bank) = 0.12 / 0.70 = 0.1714
3. P (Jerry and Susan @ Bank | Susan or Jerry @ Bank) = 0.08 / (1 – 0.58) = 0.1905

**1.2**

a) .80 - .79 = 0.01

b) .90-.79 = .11

c) 1 - .91 = .09

**1.3**

Check for independence: P (J∩S ) = P ( J ) \* P ( S ) if this is true then they are independent

0.08≠0.3\*0.2

Since it is not true, then they are dependent events.

**1.4**

a)

A = event that sum equals 6

B = event that second die is 5

P (A) = 5/36

P (B) = 6/36

P (A ∩ B) = P (A) \* P (B) if this is true then they are independent

1/36≠5/216

A and B are not independent

b)

C = event that sum is 7

D = first dice is 5

P(C) = 6/36

P(D) = 6/36

P (C ∩ D) = P (C) \* P (D) if this is true then they are independent

6/36=6/36

C and D are independent

**1.5**

A = the company will choose TX

B = the company will choose AK

C = the company will choose NJ

P(A) = 0.6

P(C) = 0.1

P(B) = 1 – P(A) – P(C) = 0.3

P(L|A) = 0.3

P(L|B) = 0.2

P(L|C) = 0.1

1)

Prob of finding oil = P(L) = P(L|A) \* P(A) + P(L|B) \* P(B) + P(L|C) \* P(C)

= 0.3 \* 0.6 + 0.2 \* 0.3 + 0.1 \* 0.1 = 0.25

2)

= P(A∩L) / P(L) = P(L|A) \* P(A) / (P(L|A) \* P(A) + P(L|B) \* P(B) + P(L|C) \* P(C))

= 0.6 \* 0.3 / 0.25 = 0.72

**1.6**

a) 1,490 / 2,201 = 0.68

b) 325 / 2,201 = 0.148

c) 203 / 711 = 0.2855

d) 711/2,201 \* 325/2,201 = 0.047

203 / 2,201 = 0.092

The events are not independent

e) 6 / 711 = 0.01

f) 654 / 711 = 0.92

g)

A = adult

C = Child

D = First Class

P(A∩D) = 197/2201=0.083; P(C∩D) = 6/2201=0.0027

P(C) = 57/2201; P(D) = 203/2201; P(A) = 654/2201

P(C)\* P(D) = (57\*203) / 203 \* 2201 = 0.0023

Since they are not equal, they are not independent.