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Assignment 2

Problem 14

1. ⅙ \* ⅙ = 1/36
2. Well the available options for rolling 4 or less are <1,1>, <1,2>, <1,3>, <2,1>,<2,2>,<3,1>, and 2 of those are doubles, the conditional probability is 2/6 = 1/3
3. The possible combiations are <6,1>, <6,2>, <6,3>, <6,4>, <6,5>, <6,6>, <1,6>, <2,6>,<3,6>, <4,6>,<5,6> = 11/36.
4. With this, there are 30 possible outcomes. Out of these, there are 10 outcomes where at least one of the rolls is a 6. THerefore, the conditional probability is 10/30 which equals ⅓.

Problem 16

Let C1 = coin with both heads

Let C2= coin both tails

Let C3 = fair coin

P(C1) = P(C2) = P(C3) = ⅓

H shows the event that it comes heads.

P(H|C1) = 1 P(H|C2) = 0 P(H|C3) = .5

Using Baye’s theorem, the probability would be:

.5 \* ⅓ / 1\*⅓ + 0 \* ⅓ + .5 \* ⅓

So the probability would be .3333 or ⅓.

Problem 16 Code:

##problem 16

import random

rolls = 10

success = 0

failure = 0

for i in range(rolls):

coinchoice = random.randint(1,3)

if (coinchoice == 1): ##heads in both faces

failure = failure+1

elif (coinchoice == 2): ##heads and tails

success = success+1

elif (coinchoice == 3): ##tails on both faces

failure = failure+1

probability = (success / failure)

print(probability \* 100)

Problem 22 Code:

import random  
  
k = 5  
m = 10  
n = 5  
  
for i in range(k):  
 k = k-1  
 total = (m+n+1)  
  
  
probability = m / total  
print(probability)

Game of Pairs Problem:

If it is A’s turn to draw, and they have a 6,5, and 3, that means that there are 49 cards left in play.

In the deck there are:

1 one

2 twos

3 threes

4 fours

5 fives

6 sixes

7 sevens

8 eights

9 nines

10 tens

Out of the 49, she needs either a 6,5 or a 3. To pair with a 6, she has a 4/49 chance, to get a 5, she has a 4/49 chance, and to get a 3 pair, she has a 2/49 chance. So the probability that she gets a pair would be:

4+4+2 / 49 = 10/49

If it is B’s turn to draw, they have a 10, 6, and 5. There are still 49 cards left in play.

Out of the 49 cards remaining, B needs a 10, 6, or 5. To pair with a 10, B has a 9/49 chance. To pair with a 6, B has a 4/49, and to pair with a 5, B has a 4/49 chance.

So B’s probability of pairing would be:

9+4+4 = 17/49.