John Kiyak

CS 355

Assignment 1

Problem 1

A = {2,4,6}

B = {4,5,6}

Complement of A = {1,3,5}

Complement of B = {1,2,3}

(A U B)c  = Ac ⋂ Bc

{1,3}

(A ⋂ B)c = Ac U Bc

{1,3}

Since both of them have the same set and answers, it proves the DeMorgan’s theorem.

Problem 5

P(G) = .60

P(C) = .70

P(B) = .40

P(N) = ?

According to the additive axiom, we can conclude that

P(A U B) = P(A) + P(B) - P(A ⋂ B)

So plugging into the equation, we can see that:

1 - (.6+.7-.4) = .1

Problem 6

In a normal dice, you can get these outcomes.

{1,2,3,4,5,6}

If the even numbers are twice as likely than the odd numbers, you can set it up like this.

{p, 2p, p, 2p, p, 2p}

If you add them all up, you get 9.

The probablility that you get an odd number is 1/9, and the probability that you get an even number is 2/9.

|  |  |
| --- | --- |
| Number | Probability |
| 1 | 1/9 |
| 2 | 2/9 |
| 3 | 1/9 |
| 4 | 2/9 |
| 5 | 1/9 |
| 6 | 2/9 |

To figure out the probability of getting a number less than 4, you simply add up the probability of numbers 1 through 3, which is 1/9 + 2/9 + 1/9 = 4/9.

Program 1

In the first program, with the percentage of heads being 50/50, when tested 10 times, it can be as low as a 30 percent for heads, but as you go up and do more tests, the tests seems to level out and become closer and closer to 50 percent.

In the second program, it is about the same. With a 75% probability for heads, as the number of tests increase, the closer the heads percentage comes to 75%.

Program 2

In the second program, even with the unfair dice, the probability for rolling less than a four would be closer to 50 percent even with the increased odds. As the number of rolls increased, the numbers went from high or low (40% or 70%) and began to normalized at around 50 percent as the rolls increased.