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Conditional Probability Homework

**Q1)**

**E**

**Q2)**

**C**

**Q3)**

**B**

**Q4)**

$$|E| = 6$$

$$|F| = 8$$

$$(E \cap F) = 1100, 1010, 0110$$

$$|(E \cap F)| = 3$$

$$P(E|F) = \frac{|(E \cap F)|}{|(F)|} = \frac{3}{8}$$

$$P(E) = \frac{6}{16} = \frac{3}{8}$$

**Since, that**

$$P(E) = P(E|F)$$

Then E and F are independent events

Q5)

Our Sample space consists of 12 numbers, from 1 to 12.

We will consider our random variable X to be the probability for this number to appear

$$X(r) = P(r)$$

Here, we have two ways to get r, If r is less than 7 then it get can be the number of the first dice, and the other way is the P(2 \* tails) times the probability of the sum of the first dice and the second dice to be r.

$$P(r) = \left(\frac{1}{8} * \frac{3}{4}\right) + \left(\frac{1}{6} * \frac{1}{4} * \frac{1}{6} * P(a + b)\right)$$

For all r on Sample space

With this function to calculate the expected

```
sum = 0

for i in range(1, 8):
    sum += (((i - 1) * (1 / 144)) * i)
    if i >= 1 and i <= 6:
        sum += (1 / 8)

j = 8

for i in range(6, 1, -1):
    sum += (((i - 1) * (1 / 144)) * j)
    j += 1
```

The expected is 2.5