ASSIGNMENT on STA102
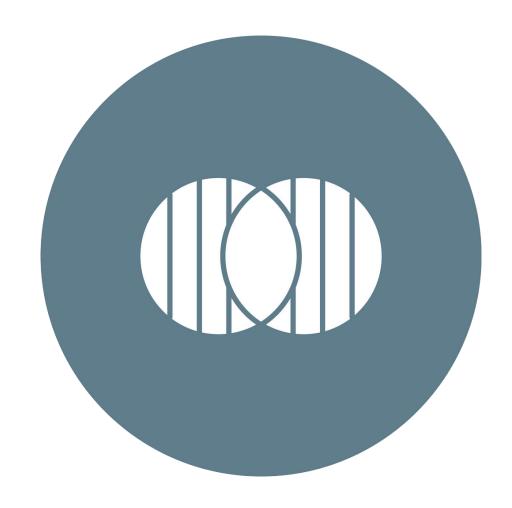
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Section: 04

STA102
Statistics and Probability
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https://ahjim.com

JIM

Assignment -5

Answer to the question no 5

a

Given the the Events "A" and "B" are metually exclusive event,

So,

Probability of either A or B occurs is

$$P(A \cup B) = P(A) + P(B)$$

$$= 0.3 + 0.5 = 0.8$$

here,

$$P(A) = 0.3$$

$$P(B) = 0.5$$

b

Probability of A occours but B does not

$$P(A \cup B') = P(A) - P(A \cap B)$$

$$= 0.3 - 0 = 0.3$$

here,

$$P(A) = 0.3$$

$$P(A \cap B) = 0 \text{ [As metually exclusive]}$$

c

Probability of both A and B occuring is

$$P(A \cap B) = 0$$

As they are metually exclusive that means they don't have any elements in common. So, it's 0.

<u>Answer to the question no 2</u>

<u>a</u>

Arrives <s>no</s> on time given that it departed on time is.

$P(\text{Arrives on time} \mid \text{departed on time}) = \dfrac{P(D \cap A)}{P(D)}$

$= \dfrac{0.78}{0.83}$

here,
$P(D \cap A) = 0.78$
$P(D) = 0.83$

<u>b</u>

Departed on time given that it has arrived on time is,

$P(\text{Departed} \mid \text{Arrived}) = \dfrac{P(D \cap A)}{P(A)}$

$= \dfrac{0.78}{0.82}$

here,
$P(D \cap A) = 0.78$
$P(A) = 0.82$

<u>Answer to the question no 3</u>

The probability of removing first switch is defected is,

$P(D_1) = \dfrac{5}{20}$

The probability of removing the second switch is also defected is,

$P(D_2) = \dfrac{4}{19}$

$P(\text{Both Defected}) = \dfrac{5}{20} \times \dfrac{4}{19}$

<u>Ans:</u>

Answer to the question no 4

a

Probability of
a randomly selected person is male, given that the person
has a secondary education is

$$P(\text{Male}|\text{Secondary education}) = \frac{28}{78}$$

here,

Total person have
secondary education
is, $P(\text{Sec edu}) = \frac{78}{200}$

$P(\text{male}) = \frac{88}{200}$

So, $P(\text{Male} \cap \text{Sec. edu})$

$= \frac{28}{200}$

b

Probability of the person being not having college degree
given that the person is female is,

$$P(\text{no college degree} | \text{Female}) = \frac{P(\text{no college degree} \cap \text{Female})}{P(\text{Female})}$$

$$= \frac{95}{112}$$