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CIS (45)

Probability and Statistics

Assignment # 01

Exercise # 3.2 :-

Question # 01

A probability value is a number between 0 and 1 inclusive :

a : 50 - 50 = 50% = 0.5

b : 20% = 0.2

c : no chance = 0% = 0.0

Question # 03

Since $0 \leq P(A) \leq 1$ is always true, the following values then 0 or greater than 1 cannot be probabilities.

Valuess Less than 0 : -1

Values greater than 1 : 2, 5/3, $\sqrt{2}$

Question # 07

Let H = getting a home run

P(H) = 73/476 = 0.1534

Yes ; this is very different from his lifetime probability of 567/7932 = 0.715. It is about twice as high.

Exercise # 3.3 :-

Question # 01

a. NO, it's possible for a cardiac surgeon to be a female.

b. NO, it's possible for a female college student to drive a motorcycle

c. Yes, a person treated with Lipitor would not be in the group that was given no treatment.

Question # 03

a. $P(\bar{A}) = 1 - P(A) = 1 - 0.05 = 0.95$

b. Let B = a randomly selected woman over the age of 25 has a bachelor's degree.

c. $P(\bar{B}) = 1 - P(B) = 1 - 0.0218 = 0.782$

Question # 05

Make a chart like following.

flower	Green	Yellow	
purple	5	4	9
white	3	2	5
	8	6	14

There are following two approaches :

1. $P(G \text{ or } W) = P(G) + P(W) - P(G \& W)$
$= 8/14 + 5/14 - 3/14$
$= 10/14 \Rightarrow 5/7$
$= 0.714$

2. $P(G \text{ or } W) = P(GP \text{ or } GW \text{ or } YW)$

$= P(GP) + P(GW) + P(YW)$

$= 5/14 + 3/14 + 2/14$

$= 10/14 \Rightarrow 5/7$

$= 0.714$

Exercise # 3.4 :-

Question # 03

Let T = getting tails when tossing a coin.

Let 3 = getting a three then rolling a dice

$P(T \text{ and } 3) = P(T) \cdot P(3|T) = (1/2) \cdot (1/6) = 1/12$

Question # 21

Refer to the table at below:

$p(Pos_1 \text{ and } Pos_2) = P(Pos_1) \cdot P(Pos_2)$

$= (83/99) \cdot (82/98)$

$= 0.702$

		Test Result: Pos	Test Result: Neg	
Pregnant?	Yes	80	5	85
	No	3	11	14
		83	16	99

Question # 23

Refer to the table for exercise # 21.

$P(Yes_1 \text{ and } Yes_2) = P(Yes_1) \cdot P(Yes_2)$

$= (85/99) \cdot (84/98)$

$= 0.736$

Exercise # 3.5 :-

Question # 01 :-

It is not true that "at least one of them has Group A blood," then "none of them has Group A blood".

Question # 03 :-

It is not true that "none of them is correct," then "at Least one of them is correct".

Question # 07 :-

Let B = a child is a boy.

$P(B) = 0.5$, for each birth

$P(\text{at least one girl}) = 1 - P(\text{all boys})$

$= 1 - P(B_1 \text{ and } B_2 \text{ and } B_4 \text{ and } B_5)$

$= 1 - P(B_1) \cdot P(B_2) \cdot P(B_3) \cdot P(B_4) \cdot P(B_5)$

$= 1 - (0.5)(0.5)(0.5)(0.5)(0.5)$

$= 1 - 0.03125$

$= 0.96875$

Yes; that probability is high enough to be "Very Confident" of getting at least one girl. Since 0.03125 is less than 0.05, the accepted of an unusual event.