Indian Institute of Technology Hyderabad

PROBABILITY ASSIGNMENT

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Contents

1 problem 1

compute P(A | B),IF P(B)=0.5 and P(AB)=0.32 ?

2 solution 1

By using property of conditional probability we have,

$$P(A \mid B)=\frac{P(AB)}{P(B)}=\frac{0.32}{0.5}=0.64$$

3 problem 2

Let A and B be independent events with P(A)=0.3 and P(B)=0.4 find
(i).P(AB)
(ii).P(A+B)
(iii).P(A | B)
(iv).P(B | A)

4 solution 2

Since A and B are independent events, we have

(i).P(AB)=P(A) P(B)

$$P(AB)=0.3 \times 0.4$$

$$P(AB)=0.12$$

(ii). P(A+B)=P(A)+P(B)-P(AB)

$$P(A+B)=0.3+0.4-0.12=0.58$$

(iii).$P(A \mid B)=\frac{0.12}{0.40}=0.3$

(iv).$P(B \mid A)=\frac{P(B+A)}{P(A)}=\frac{0.12}{0.30}=0.4$

5 problem 3

Two dice are thrown simultaneously. If X denotes the number of sixes, find the expectation of X.

6 solution 3

let X be the random variable which denotes the number of sixes on two dices so,
X may have value 0,1,or 2
Total number of possible outcomes = 36
when a two discs are rolled once,
$P(X=0)=P(\text{non-six on both side})=\frac{25}{36}$
P(X=1)=P(six on first and non six on

second)+P(non six on first and six on the second)=$\frac{10}{36}$

Therefore,The required probability distribution as follows

X	0	1	2
P(X)	$\frac{25}{36}$	$\frac{10}{36}$	$\frac{1}{36}$

The Expectation of X=Mean of the variable X

E(X)=$\sum_{i=1}^{n} x_i P(x_i)$

$\sum$ X P(X)=$\frac{1}{3}$