

# Assignment-1

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Download all latex codes from:

<https://github.com/PrasannaLanka/Assignment1/blob/main/Assignment1/main.tex>

$$\Pr(X = 1, Y > 4) = \Pr(X = 1, Y = 5) + \Pr(X = 1, Y = 6) \quad (0.0.3)$$

$$= \frac{1}{6} \quad (0.0.4)$$

## PROBLEM 2.15

Consider the experiment of tossing a coin. If the coin shows head, toss it again but if it shows tail, then throw a die. Find the conditional probability of the event that “the die shows a number greater than 4” given that “there is at least one tail”.

$$\Pr(Y > 4 | X = 1) = \frac{\Pr(Y > 4, X = 1)}{\Pr(X = 1)} \quad (0.0.5)$$

$$= \frac{2}{9} \quad (0.0.6)$$

∴ The required probability is  $\boxed{\frac{2}{9}}$

## SOLUTION

Given that a coin is tossed. If coin shows head, it is tossed again. If it shows tail, then a die is thrown. Let  $X \in \{0, 1\}$  be the random variable such that 1 represents occurrence of tail, 0 represents occurrence of head when coin is tossed.

TABLE I: Probability distribution for values of X

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

Let Y denotes random variable for the getting a number on the die thrown, then the probability distribution is

TABLE II: Probability distribution for values of Y

Y	1	2	3	4	5	6
P(Y)	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$	$\frac{1}{6}$

$$\Pr(X = 1) = \sum_{i=1}^6 \Pr(X = 1, Y = i) + \Pr(X = 0, X = 1) \quad (0.0.1)$$

$$= \frac{3}{4} \quad (0.0.2)$$