

## Assignment: Probability

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**13.4.3** Let  $X$  represent the difference between the number of heads and the number of tails obtained when a coin is tossed 6 times. What are possible values of  $X$ ?

**Solution:** A coin is tossed 6 times and  $X$  represents the difference between the number of heads and the number of tails.  $Y = \{0, 1\}$  represents the head and tail.

Random Variable	Outcome
$Y = 0$	Head
$Y = 1$	Tail

Table 13.4.3.2: Outcomes of Random variable.

$$X(60, 01) = |6 - 0| = 6 \quad (13.4.3.1)$$

$$X(50, 11) = |5 - 1| = 4 \quad (13.4.3.2)$$

$$X(40, 21) = |4 - 2| = 2 \quad (13.4.3.3)$$

$$X(30, 31) = |3 - 3| = 0 \quad (13.4.3.4)$$

$$X(20, 41) = |2 - 4| = 2 \quad (13.4.3.5)$$

$$X(10, 51) = |1 - 5| = 4 \quad (13.4.3.6)$$

$$X(00, 61) = |0 - 6| = 6 \quad (13.4.3.7)$$

Thus, the possible values of  $X$  are 0, 2, 4 and 6.