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 2: Outcomes of Random variable.

$$X(60, 01) = |6 - 0| = 6 \tag{13.4.3.1}$$
$$X(50, 11) = |5 - 1| = 4 \tag{13.4.3.2}$$
$$X(40, 21) = |4 - 2| = 2 \tag{13.4.3.3}$$
$$X(30, 31) = |3 - 3| = 0 \tag{13.4.3.4}$$
$$X(20, 41) = |2 - 4| = 2 \tag{13.4.3.5}$$
$$X(10, 51) = |1 - 5| = 4 \tag{13.4.3.6}$$
$$X(00, 61) = |0 - 6| = 6 \tag{13.4.3.7}$$

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