**Expected value:** For a discrete variable X with probability function P(X), the expected value

For example, for a dice through experiment, the set of discrete outcome is {1,2,3,4,5,6} and each of this outcome has same probability 1/6. Hence, the expected value of this experiment will be

Now let’s solve some problem. Because learning a topic is more interesting with problem solving.

**Problem-1: What is the expected number of coin flips for getting a head when P(H) = 0.4**

**Solution:**

Here,

Note that this is like a recursive problem. You’ve to calculate the expected number of flips for getting a head. So, when you got a tail, then you have to flip the coin once again and you’ve already waste a coin flip. This is denoted as, .

When you got a head then you are done and you don’t have to flip the coin again. This is denoted as,

**Problem-2: What is the expected number of coin flips for getting two consecutive heads?**

**Solution:**

**Problem-3: You’re an interviewer and candidates are appearing one after another. Probability of each candidate getting selected is 0.16. What is the expected number of candidates that you’ll need to interview to make sure that you select somebody?**

**Solution:**

**Problem-4: What is the expected number of dice throws required to get a four?**

**Solution:**

**Problem-5: What is the expected number of coin flips for getting n heads?**

**Solution:**

………………………………………………………………………………………………….

**Problem-6: You’re in a long cave that can be represented as a 1\*N grid. Initially you are at position 1. Now each turn you through a perfect 6 sided dice. IF you get X in your dice, you add X to your position and collect all the gold from the new position. IF your new position is outside the cave, then you keep throwing again until you get a suitable result. When you reach the Nth position you stop your journey.**

**Find out the expected number of gold you can collect using the given procedure.**

**Solution:**