# Uniform and Binomial Distribution Practice

*For each situation below, determine whether the distribution is **Uniform**, **Binomial**, or **Neither**. If it's Uniform or Binomial, list the parameters ($n$ for Uniform, $n$ and $p$ for Binomial). If there is a question, answer it.*

1. You draw a card from a standard deck of 52 cards. You count 1 point for a red card and 2 points for a black card. What is the expected value of a trial?
2. You read that 60% of people will not stop to pick up a loonie off the sidewalk. If 40 people each walk past a loonie on the sidewalk, how many would you expect to pick it up? What is the probability that more than 35 people would pick it up?
3. Grocery stores estimate that 50% of customers who unknowingly purchase spoiled food will return it to the store for an exchange or a refund. If 10 people unknowingly purchase spoiled food, what is the probability that more than half of them do not return it to the store?
4. Newly-planted trees have a 93% probability of surviving their first year. If a hedge is planted with 8 trees, what is the probability that all of the trees survive their first year?
5. You flip a coin 5 times. What is the probability that you get more heads than tails?
6. At a joke shop you buy an **unfair** coin which has a 58% probability of landing on heads and a 42% probability of landing on tails. If you flip it 5 times, what is the probability that you get more heads than tails?
7. A casino is considering running a new game. It costs the player $1.00 to play a round. If the player wins the round, the House (the casino) pays $2.00 to the player. If the player loses, they win nothing. If the probability of the House winning (and the player losing) is 54%, **what is the expected value** of a round **from the casino's perspective**? What is the probability that the casino **loses money overall** if 5 rounds are played? Is the game **reasonable** for the casino to run?

| $k$ | $P(X = k)$ |
|-----|------------|
| 0 | $\dfrac{2}{5}$ |
| 1 | $\dfrac{1}{4}$ |
| 2 | $\dfrac{1}{5}$ |
| 3 | $\dfrac{1}{10}$ |
| 4 | $\dfrac{1}{20}$ |

| $k$ | $P(X = k)$ |
|-----|------------|
| $-3$ | $\dfrac{1}{7}$ |
| $-2$ | $\dfrac{1}{7}$ |
| $-1$ | $\dfrac{1}{7}$ |
| 0 | $\dfrac{1}{7}$ |
| 1 | $\dfrac{1}{7}$ |
| 2 | $\dfrac{1}{7}$ |
| 3 | $\dfrac{1}{7}$ |