

31 Lecture - CS101

Important Subjective

1. **What is the probability of getting heads on a fair coin flip?**

Answer: The probability of getting heads on a fair coin flip is 50%.

2. **How is a coin flip used to generate random numbers?**

Answer: A coin flip can be assigned heads to 0 and tails to 1, and then flipped a number of times to generate a binary string. This binary string can then be converted to a decimal number, giving you a random number.

3. **Why is generating truly random numbers on a computer a challenge?**

Answer: Computers are deterministic machines, which means that they always follow a set of instructions and produce the same output every time they are given the same input.

4. **How are coin flips used to ensure fairness in games and simulations?**

Answer: In games like poker or blackjack, the outcome of a coin flip can be used to determine who goes first or who gets to make a certain decision. In simulations, coin flips can be used to introduce random events, such as a car accident or a power outage, that can affect the outcome of the simulation.

5. **What is the Monty Hall problem?**

Answer: The Monty Hall problem is a probability puzzle that involves three doors and a prize behind one of the doors. The problem involves choosing a door and then switching to another door after one of the other doors is revealed to be empty.

6. **How is the Monty Hall problem solved using coin flips?**

Answer: The Monty Hall problem can be solved using coin flips to demonstrate that the probability of winning the prize is higher if you switch doors.

7. **What is the purpose of using a coin flip in simulations?**

Answer: The purpose of using a coin flip in simulations is to introduce random events that can affect the outcome of the simulation.

8. **How is a coin flip used in cryptography?**

Answer: Coin flips can be used in cryptography to generate random numbers that are used as keys to encrypt and decrypt data.

9. **What is the probability of getting three heads in a row on a fair coin flip?**

Answer: The probability of getting three heads in a row on a fair coin flip is $1/8$ or 12.5%.

10. **How can coin flips be used to study probability and statistics?**

Answer: Coin flips can be used to study probability and statistics by flipping a coin multiple times and keeping track of the results to learn about the probability of getting heads or tails.