



#26: Probability in Computer Science

Review common probability terminology:

- What is the **sample space** of a single dice? Of two dice?
- Give two examples of **events** given X dice.
- Given two **random variables** D_1 and D_2 , describe a random variable for the sum of two dice.
- What is the **expected value** of D_1 and D_2 ? Of the sum of both?

Randomization in Algorithms

1. Assume input data is random to estimate average-case performance

Give an example of an average case analysis:

Where is the source of randomness?

What assumptions were made?

2. Use randomness inside algorithm to estimate expected running time

Give an example of an expected case analysis:

Where is the source of randomness?

What assumptions were made?

3. Using randomness inside algorithm to estimate expected accuracy

Give an example of an expected case accuracy:

What are the four outcomes in probabilistic accuracy?

Where is the source of randomness?

What assumptions were made?

What is the difference between a **Las Vegas** algorithm and a **Monte Carlo** algorithm?