Introduction to Probability

Discrete Random Variables

A random variable is a numerical description of the outcome of an experiment.

Random variables can be classified as discrete or continuous, depending on the numerical values they may take.

A ranom variable that may assume any numerical value in an interval or collection of intervals is called a continuous random variable.

Question 3

Suppose a fair coin is tossed six times. The number of heads which can occur with their respective probabilities are as follows:

xi 0 1 2 3 4 5 6 p(xi) 1/64 6/64 15/64 20/64 15/64 6/64 1/64

a) Compute the expected value (i.e. expected number of heads). b) Compute the variance of the number of heads.

Question 4 A player tosses two fair coins. He wins \$2 if two heads occur, and \$1 if one head occurs. On the other hand, he loses \$3 if no heads occur. Find the expected value $E(X)$ of the game. Is the game fair?

Discrete Random Variable : Example

For a particular Java assembler interface, the operand stack size has the following probabilities:

Stack Size	0	1	2	3	4
Probability	.15	.05	.10	.20	.50

- Calculate the expected stack size.
- Calculate the variance of the stack size.