STAT 230

July 4 Tutorial

Preview

In this tutorial, we will look at discrete distributions, their pf's and cdf's and how to use them to calculate probabilities. A general application for a discrete r.v. will be explored and we will also explore expectation and variance for a discrete r.v.

We will also look at continuous distributions, their pf's and cdf's and how to use them to calculate probabilities. We will explore percentiles, and variance for a continuous r.v.

Problem 1

Suppose you are given the following information regarding the pf of a discrete random variable, X:

x	0	1	2	3	4	5	6
f(x)	0.05	0.1	0.1	0.2	0.3	0.05	0.2

a) Using the information given above, determine $P(2 \leq X < 5)$.
b) Determine the cdf of the discrete random variable X.
c) Calculate the expected value and variance of X.
d) Suppose $Y = 2 - 3X$. Calculate the expected value and variance of Y.

Problem 2

In a game of “green ball”, two selections are made, without replacement from a box that has 4 white ping pong balls and 2 green ping pong balls. The amount that a player wins is determined by how many green ping pong balls are selected. A player will pay $5 to play. They can decide to be paid under two rules. The information is given below:

Rule A

# of green balls	Amount Received
0	0
1	$2
2	$10

Rule B

# of green balls	Amount Received
0	0
1	$1
2	$20

Is this game fair?

If you were playing the game, which rule would you choose, and why?

Problem 3

Suppose that the length of time X (in years) that a patient, suffering from a certain disease, is in remission has a pdf given by: $f_X(x) = \frac{x^2}{9}$ for $0 \leq x \leq 3$; 0, otherwise.

a) Determine the cdf of X.

b) Use the cdf from part a) to determine $P(X > 2)$.

c) Calculate Var(X).

d) What is the median length of time (in years) that a patient, suffering from a certain disease, is in remission?