

The Discrete Uniform Distribution

Discrete Random Variables

A discrete random variable is defined as any event subject to random variation when a list can be made of the possible outcomes

Notation – know your inequalities!

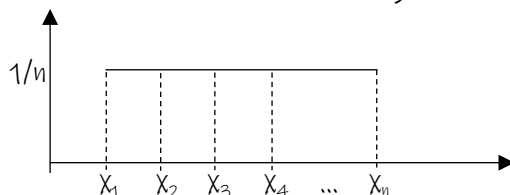
$(X = x)$	X can only take the value EQUAL TO x
$(X \leq x)$	X can take any integer value less than OR EQUAL TO x
$(X < x)$	X can take any integer value less than BUT NOT EQUAL TO x
$(X \geq x)$	X can take any integer value more than OR EQUAL TO x
$(X > x)$	X can take any integer value more than BUT NOT EQUAL TO x
$(a < X < b)$	X can take any integer value between a and b but NOT a OR b
$(a \leq X < b)$	X can take any integer value between a and b INCLUDING a but NOT b
$(a < X \leq b)$	X can take any integer value between a and b INCLUDING b but NOT a
$(a \leq X \leq b)$	X can take any integer value between a and b INCLUDING a and INCLUDING b

The Discrete Uniform Distribution

The Discrete Uniform Distribution is defined as a random variable with p.d.f. (probability density function) given by:

- $P(X = x) = 1/(k+1)$ for all values of $x = 0, \dots, k$
- $P(X = x) = 0$ for other values of x
- where k is a constant

The Discrete Uniform Distribution is sometimes called the *Rectangular Distribution* because when drawn on a probability diagram it looks like a rectangle with the height set at $1/n$



If the distribution has outcomes of 1, 2, 3, ..., n then the probability of each value occurring is $1/n$

When calculating probabilities involving inequalities we must combine (add) the probabilities of all values of x

When the values are evenly spaced, you can find the mean and median by:

1. adding the first and last values
2. dividing by 2