Computer Programming for statistics II

MathsNET
A joined up approach to teaching and learning mathematics

0.1 Level 1

Use the blocks below to create 50 Bernoulli random variables, $\{X_i\}$. Count the number of successes that you obtain and the number of failures and draw a bar chart showing the fraction of failures and the fraction of successes that you obtained from these 50 trials.

0.2 Level 2

Use the blocks below to generate 50 samples of a random variable with probability mass function $P(X = 0) = 0.2$, $P(X = 1) = 0.5$ and $P(X = 2) = 0.3$. Count the number of 0, 1 and 2 values you get when you generate these random variables and hence plot a bar chart that shows the fraction of times 0 came up, the fraction of times 1 came up and the fraction of times the random variable was equal to 2. Click here if you want to watch the explanatory video.

0.3 Level 3

Use the blocks below as well as what you learnt from the video to generate a random variable, X, from a poisson distribution with $\lambda = 2$. Plot a point on the graph at $(1, X)$. Click here if you want to watch the explanatory video.

0.4 Level 4

Use the blocks to generate an exponential random variable, Y, from an exponential distribution with $\lambda = 4$. Plot a point on the graph at $(1, Y)$. Click here if you want to watch the explanatory video.

0.5 Level 5

Use the blocks to generate 50 normal random variables. Use these 50 samples to calculate an estimate for the probabilty density function for the distribution that these random variables were sampled from. To do this divide the range between -4 and +4 into 20 intervals of length 0.4 and create a list with one scalar for each or the sub-ranges in this range. When you generate your random variables use the list that you created to count the number of times the random variable falls into each of the sub-ranges. Once you have generated all the random variables plot a bar graph showing the fraction of times that the random variable fell into each of the intervals of interest on the y axis and the value at the center of the sub-range on the x. Click here if you want to watch the explanatory video.