Part II and III

The second part of the assignment is similar to the first except that you should explore continuous probability distributions instead of discrete ones.

The distributions under consideration are:

- **continuous uniform;**
- **exponential;**
- **normal;**
- **Weibull;**
- **beta;**
- **chi-squared;**
- **log-normal.**

Each distribution should be treated in a way similar to the distributions of the first part. Specifically, you should present formulae for their ***pdf*** and ***cdf***, and your observations of the influence of distributions' parameters on ***pdf***s.

Since these distributions are continuous, there's no need to draw their ***pdf***s as stem plots.

Remark

Mathcad has built-in functions for **pdf** *and* **cdf** *of Weibull distribution. However, for reasons unknown, the Mathcad software developers implemented* **dweibull** *and* **pweibull** *functions assuming parameter* ***η*** *of the distribution equals one. There is a way to tackle this problem, but it is easier to write your own functions, introducing this parameter.*

At this point, you have learned about various moments of random variables. So, the third part of the assignment consists in obtaining expected value, median, variance, skewness, and excess kurtosis for all the distributions involved, both discrete and continuous.

For the distributions presented in the Lectures, you already have the expressions for calculating these characteristics. As for the others, you should find the formulae on your own.

Setting the distributions' parameters at values of your choosing, you should obtain expected value, median, variance, skewness, and excess kurtosis, first, by using the general formulae, and then, by the expressions which are specific for the distributions.

Remark

To find the median of the distribution use quantile functions, e.g. **qnorm***.*

Remark

Sometimes Mathcad fails to compute complex integrals involved in obtaining the moments. In these situations, you only should use the expressions specific for the distributions.
