# *KFUPM - COMPUTER ENGINEERING DEPARTMENT*

## COE-587 –Performance Evaluation and Analysis
## CSE-642 –Computer Systems Performance

Quiz02 – Due Wed Feb 25th, 2015

**Student Name:**
**Student Number:**

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**Problem:** (**20 points**) This task is designed to introduce basic Matlab skills, apply the knowledge in textbook chapter 10 (The Art of Data Representation) and introduce the third part of textbook on Probability and Statistics. Using Matlab, it is required to perform the following steps:

1. Generate a vector, $V$, of $N$ exponentially distributed random samples with mean equal to $\lambda^{-1} = 2$.
2. Compute and plot the histogram for random vector using an appropriate $x$-axis (selecting appropriate number of pins and size for the pin).
3. The histogram obtained in step 2 may be used as an empirical approximation for the probability density function (PDF) of the distribution of concern. On one graph, plot the curves for the empirical approximation for the PDF for $N = 1000, 10000,$ and $100000$, and also plot the curve for the exact PDF formula for the exponential random variable. Comment on the result. Use proper labels and legends to differentiate between the four curves. It is recommended to use markers for plotting the three empirical PDFs while a line style is used for plotting the analytical formula.
4. Using a modified version of the code developed in the above steps, it is required to study the effect of sample size on the computed coefficient of variation. Provide a graph showing the relation between the computed coefficient of variation ($y$-axis) for the samples in the vector $V$ versus the vector size $N$ ($x$-axis). It is required to test for widely different values of $N$ ranging from 10 to $10^6$. One the same figure, provides plots for this behavior versus $N$ for three different values of $\lambda$: 0.1, 0.5, and 2;

The developed Matlab code should be very organized and well documented. Use variable names identical or very close to the mathematical variable used in this problem statement. The documentation should clearly specify the sections of the code that correspond to each part of this quiz.

Students are encouraged to cooperate and discuss the problem and the Matlab know-how, however, each student must write and submit his *own* code and results.

Generate the required outputs and import them into an organized Microsoft word file along with description and comments on the obtained results. Zip the word file together with the Matlab code and submit the zipped file by email to ashraf@kfupm.edu.sa and g201203480@kfupm.edu.sa. The name of the zip file should contain the following pattern: COE587_CSE642_142_Quiz_2_LastName_FirstName.zip. LastName and FirstName are the last and first name of the student, respectively, submitting the work.

To import figures into your word document, go to the Matlab figure Edit menu and select “copy figure”. Paste (special) the figure into the word file as “Picture (Enhanced Metafile)”. Please do not paste as any other format.

Students must ALSO submit a hardcopy of the quiz solution (i.e. the word file) and the corresponding Matlab code in one complete submission.