Indian Institute of Information Technology Guwahati
CS360: Lab Experiment 1

Matlab Begins

Date: 30.07.2019 Total Marks: 10
Deadline: 05.08.2019

Install Matlab standard edition 64 or 32 bit in your computer and implement the following questions:

Q.1) Do the following questions using Matlab commands

a) Find the angle between the vectors $\mathbf{u} = (2, 1, 2)$ and $\mathbf{v} = (1, 1, 1)$ using the cosine formula $\cos\theta = \frac{\mathbf{u}.\mathbf{v}}{\|u\|\|v\|}$ and convert $\mathbf{u}$ and $\mathbf{v}$ into unit vectors.

b) Obtain two random matrices of integers, namely, $\mathbf{A}$ and $\mathbf{B}$. Find $\mathbf{A^T B}$ and eigen values of $\mathbf{AB}$ and $\mathbf{BA}$

c) Take a 5×5 matrix and determine maximum, minimum, sum, mean and standard deviation of all the elements.

d) Obtain 4×6 random matrix from the uniform distribution. Set the values less than 0.2 to 0 and values greater than 0.8 to 1.

e) Solve the following linear system of equations using inverse function *inv()*:

$$\begin{aligned} x + 2y + 3z &= 8 \\ 2x + 5y + 2z &= 9 \\ 6x - 3y + z &= -1 \end{aligned}$$

f) Plot sin and cosine curve in the same figure using different colors for values between 0 to 2π. Use legends for the curves.

g) Find out the values for x and y which satisfy the equation $5x + 3y = 7$ and plot it.

0 marks

Q.2) Find the rank of any given matrix using gauss elimination and identify the pivot columns (don't use the function *rank()*).

10 marks