

**Faculty of Engineering, University Of Jaffna**  
**Department Of Computer Engineering**  
**EC1011 – Computing**  
**Lab 03 - Domain Specific Programming Languages**

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**Date: 09 June 2022**

**Duration: 3 Hours**

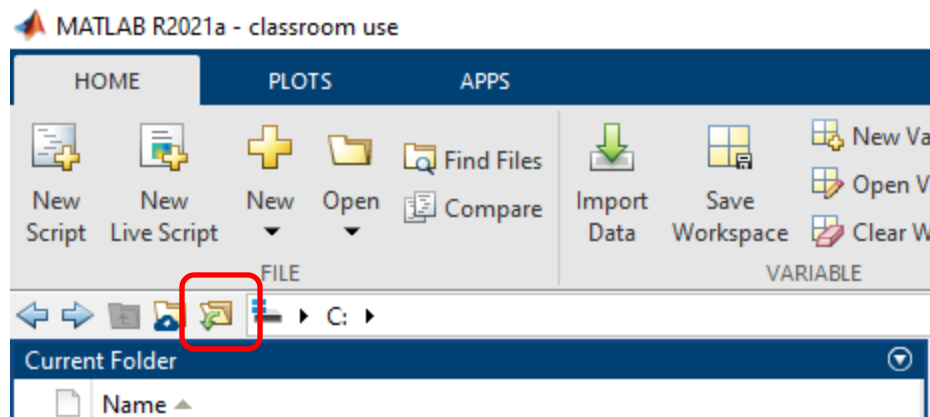
**Instructions:**

- Any plagiarized work will be given 0 marks.
- Submit your lab work as a pdf file named **Lab03\_2021EXXX.zip** (XXX – YourRegistration Number) **on/before given deadline** via team.
- Prepare your lab report with the screen shots of your answers and the corresponding code.

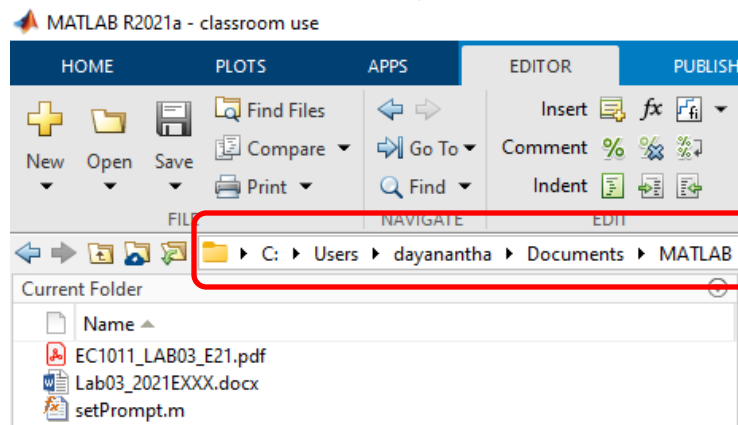
**Start-up Instructions**

**Note:** Follow the following instructions carefully otherwise you will lose marks or get no marks at all.

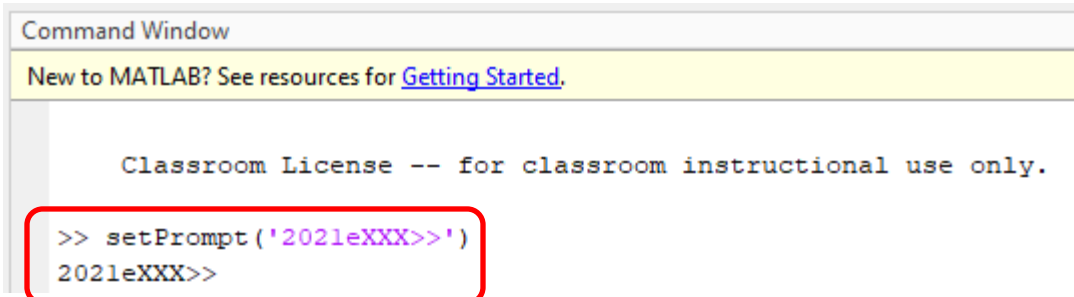
1. Download the files from teams.
2. Copy it to your Documents > MATLAB folder.
3. Open MATLAB
4. Change MATLAB current folder by clicking the browse folder button.



5. Change current folder to the place where you extracted the downloaded zip folder contents (This PC>Documents>MATLAB)

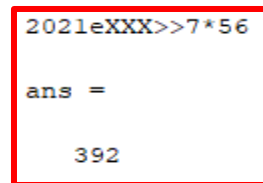


- Open `setPrompt.m` then Run the command, `setPrompt('2019eXXX>>')` in your command window (XXX – Your Registration Number)  
If you get an error like,  
**Undefined function or variable 'setPrompt'**  
or  
**'setPrompt' is not found in the current folder or on the MATLAB path**  
you have not completed step 5 properly
- Your command window should change as shown below

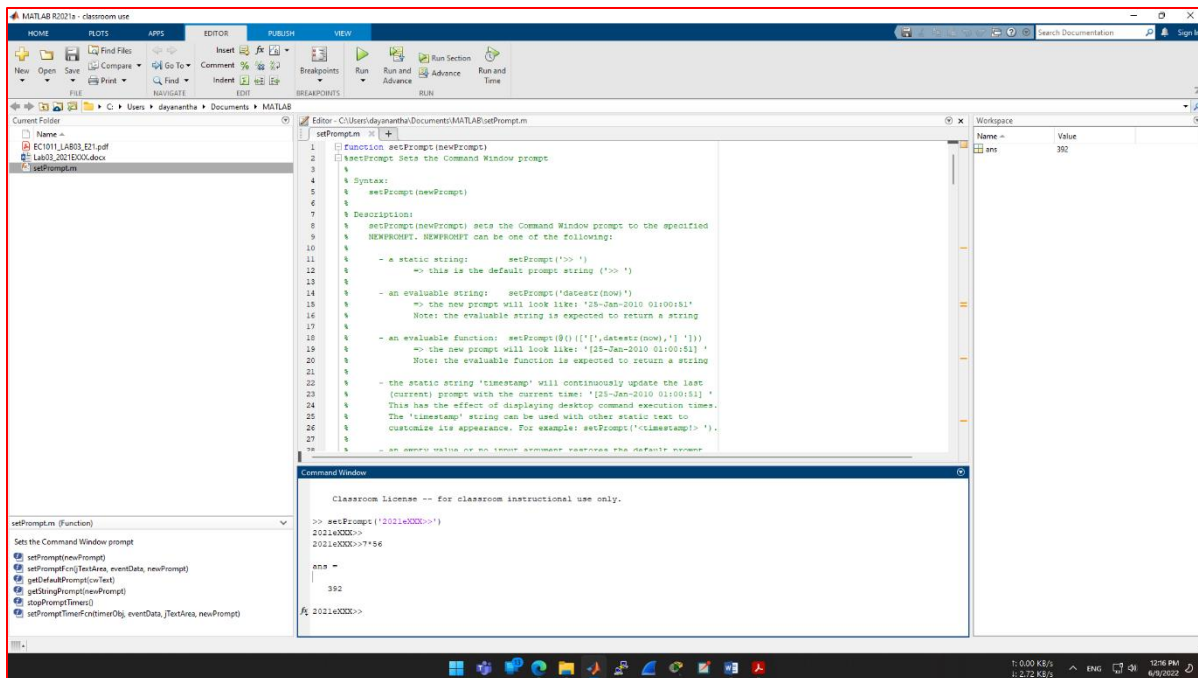


- Now you may start doing the questions below.
- While doing the questions below use the snipping tool or snip & sketch to take screenshots of your work. Note! Take only screen shots of the corresponding command and result only **not the whole window**.

Example: If the question is, Compute:  $7 \times 56$   
The screenshot should look like this



Not like this



- Note! Only the question number and screenshot is needed (no need to include the question)
- Add the screenshots to the provided template as you complete your work (Your deadline will NOT be extended).
- Rename your template and convert it to a pdf before submission

## Basic Arithmetic

1) Compute the following expressions using MATLAB

[10 marks]

a.  $\frac{(7.8^4 - 23)^{0.9}}{5.9 \times 7.5} \times (4^{1.7} \times 10^{0.3})$

b.  $\frac{\left(\sqrt[4]{(3+9^{2.3})+6}\right)^3 + 2}{\left(5.3 + 8 \times \left(\frac{1}{7}\right)\right)^{1.5}} \times 10^2$

2) Compute the following expressions using MATLAB

[15 marks]

a.  $a = 4 \times e^{\ln(5)} + \ln 46$ , where  $e$  is Euler's number

b.  $b = 2(\sqrt{10^{\log_2 128}})$

c.  $c = \log_{1/6} 7776$

3) Evaluate following expressions

[15 marks]

when

I.  $x = 6.24$  and  $y = 9.46$

II.  $x = 12.61$  and  $y = 4.78$

a.  $\frac{(x+2y)^2}{(y^{1.5}/x^{1.4})^{0.7}} + 5\left(\frac{x^{3.5}}{y^2}\right) - 7.8$

b.  $\frac{1}{6}(x^3y^2 - x^2y^3) + \left(\frac{x}{3y}\right)^2 - 5\sqrt{\frac{x}{y}}$

4)

[20 marks]

a. Find the value of  $\beta$  while  $\theta = \pi/6$  radians

$$\beta = \sqrt{\frac{1+\cos(\theta)}{1-\cos(\theta)}}$$

b. If  $\alpha = \tan^{-1} \beta$

Find the value  $\alpha$  in degrees

## Complex Numbers

1) Let  $z_1 = 2 - 3i$ ,  $z_2 = 13 + 9i$ ,  $z_3 = 7 + 8i$ , where  $i$  is an imaginary number [10 marks]

a. Find  $V = \frac{z_1 + z_2 z_3}{z_3 z_1 - z_2}$

b. Find the magnitude and angle of  $V$

c. Find the real and imaginary part of the complex number  $V$

## Matrices

1) Initialize following vectors and matrices in MATLAB

[10 marks]

a.  $a = [4 \ 9 \ 4 \ 3 \ 7 \ 5]$

b.  $b = \begin{bmatrix} 4 \\ 8 \\ 1 \\ 0 \\ 8 \\ 11 \\ 14 \end{bmatrix}$

c.  $c = [99 \ 96 \ \dots \ -9 \ -12]$

d.  $z = \begin{bmatrix} 12 & 10 & 8 & 6 \\ \frac{1}{2} & \frac{3}{8} & \frac{1}{4} & \frac{1}{8} \\ -7 & -5 & -3 & -2 \\ \frac{1}{3} & \frac{1}{2} & \frac{2}{3} & \frac{5}{6} \end{bmatrix}$  display your output as fractions

2) Create a row vectors in which the first element is  $3\pi$ , the elements decrease with increments of  $-\pi/3$ , and the last element is  $-3\pi$ .

[10 marks]

a. Get the length of the vector

3) Create a row vector with 10 equally spaced elements in between 0 to 8000

[10 marks]