Department of Electronics and Communication Engineering
19CCE203 – Computational Electromagnetics

Matlab Assignment -1

October 13, 2021

Write a program in Matlab to implement the function

1. Cos (x) using the series expansion :

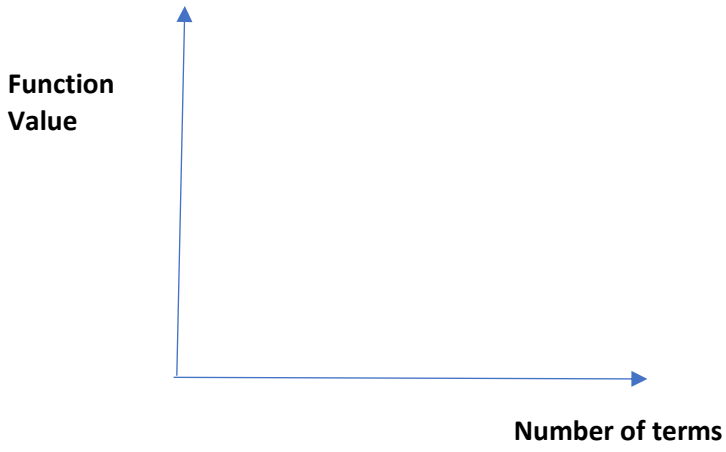
$$\cos x = 1 - \frac{x^2}{2!} + \frac{x^4}{4!} - \frac{x^6}{6!} + \frac{x^8}{8!} - \cdots \ldots$$

2. sin (x) using the series expansion :

$$\sin x = x - \frac{x^3}{3!} + \frac{x^5}{5!} - \frac{x^7}{7!} + \frac{x^9}{9!} - \cdots \ldots$$

Where "x" takes the value in radians.

You are required to plot the following:



Activity:

1. Consider the number of terms starting from 2 to atleast 20 terms of the series
2. For cos x, the "1" is considered as a term.
3. For each "number of terms" get the function value.
4. Get plots for sinx, cos x and tanx separately.
5. Identify the number of terms required to arrive at a "convergent value", that is , it may/may not be, the correct value, but the value doesn't change after that for any increase in number of terms.
6. For "x" consider the values :

$$0, \frac{\pi}{6}, \frac{\pi}{4}, \frac{\pi}{3}, \frac{\pi}{2}, \frac{2\pi}{3}, \pi, 2\pi, 0.429\pi, 0.683\pi$$

7. A single plot can contain graphs of 5 "x" values
8. So for sinx there will be two plots, and so on. So finally we need 6 plots ., with proper "legend" marking and appropriate colours.

9. Matlab is suggested. Python will be introduced in many other subjects. So request you to get exposed to matlab in this subject.

Submission Guidelines:

1. A link will be created in AUMS for the above assignment- Assign_1_Oct_13
2. Students will have to create a document with all the plots
3. The title of the word document should be "19CCE203 Computational Electromagnetics- Assignment -1" . Indicate the Date : October 13, 2021.
4. Paste the plots in a systematics fashion.
5. Provide any comments you feel , wherever you want, after any plots.
6. The document should be given the name: "**Assign_1_xx.docx**" , where "xx" is your respective Roll number -last two digits. PDF is recommended , but the naming should be as above

Evaluation Guidelines:Total – 15 Marks

1. The file upload will be checked and evaluated for 5 marks
2. Individual session with each student will be done, and will be evaluated for 10 marks.

Last date for Upload : October 23, 2021 , 5 PM
Viva sessions : Will be intimated later. After going through the uploaded documents.

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