LAB 6

Spring 2011, BESE- 15 A&B

Taylor Series

Objective

The aim of this introductory lab is to introduce you to the basic functions in the Matlab and Numerical Methods with Matlab toolbox. By the end of today's lab, you should be able to understand the Symbolic calculation and Taylor Series files.

Submission Requirements

You are expected to complete the assigned tasks within the lab session and show them to the lab engineer/instructor. Some of these tasks are for practice purposes only while others (marked as '*Exercise*' or '*Question*') have to be answered in the form of a lab report that you need to prepare. Following guidelines will be helpful to you in carrying out the tasks and preparing the lab report.

Guidelines

- In the exercises, you have to put the output in your Lab report. You may add screen print to the report by using the 'Print Screen' command on your keyboard to get a snapshot of the displayed output. This point will become clear to you once you actually carry out the assigned tasks**.**

- Name your reports using the following convention:

  Lab#_Rank_YourFullName

  - '#' replaces the lab number
  - '*Rank*' replaces Maj/Capt/TC/NC/PC
  - '*YourFullName*' replaces your complete name.
- You need to submit the report even if you have demonstrated the exercises to the lab engineer/instructor or shown them the lab report during the lab session.

Taylor Series

Taylor function returns the Taylor series approximation

- r = taylor(f)
- r = taylor(f,n,v)
- r = taylor(f,n,v,a)

f is a symbolic expression representing a function
v specifies the independent variable in the expression
a about which the series will represented
n (n-1)-order Maclaurin polynomial approximation

```
>>syms x
>>f = 1/(5+4*cos(x))
>>T = taylor(f,8)
```

T =1/9+2/81*x^2+5/1458*x^4+49/131220*x^6

Exercise 1

Write a script file to find the 1st , 2nd and 3rd derivative of $z = \sin^2(\alpha) + \cos^2(\alpha)$

Exercise 2

Write a script to generate the Taylor series as created by the built in function.