Department of Mechanical Engineering
Indian Institute of Technology Kanpur
ME685A: Home Assignment 6

Due: on or before October 02, 2021

This assignment must be your own work. Taking help from others or helping others are not allowed.

Generate 08 equally-spaced points, in the interval $[0, 2\pi]$, from the following function

$$y(x) = \sin^2(x)$$

Fit this data with a seventh-degree polynomial. Use Lagrange interpolating polynomial.

1. Write a pseudocode for solving the above problem
2. Write a computer program in any language without using any built-in interpolation library
3. Plot the original function and the polynomial approximation over the same axes. If you are using a data file for the plot, use at least 100 data points for the plot.
4. To calculate the error, find the mean and the maximum value of $\left|y(x) - P_n(x)\right|$, where $P_n(x)$ is the fitted polynomial. This calculation should be a part of your computer program.
5. Create a *pdf* document that includes the plot, pseudocode and other relevant information/calculation. Write your name and roll no at the top of each page. Also write your name and roll no in the computer program (duly commented). Put all documents in a folder. Name the folder as $< name > \_ < roll > \_ < hw6 >$. Zip the folder and upload in MooKit.

Your program file must be a plain text file. The file extension should be as per your programming language (*.c, *.cpp,*.f90,*.py etc.)