

Department of Mechanical Engineering
Indian Institute of Technology Kanpur
ME685A: Home Assignment 7

Due: on or before October 08, 2021

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

A circular ($x^2 + y^2 = 1$) disc of unit thickness has a density of $\rho = |x + y| + 1$. Numerically evaluate the average density and the (x, y) coordinate of the center of mass of the disc. To find the area and/or mass of the disc, evaluate the necessary double integrals (do not use πr^2 for area). Use trapezoidal rule with step size $h \leq 0.01$ in both x and y directions.

1. Write a pseudocode for solving the above problem
2. Write a computer program in any language without using any built-in interpolation/integration libraries
3. Create a *pdf* document that includes pseudocode, final answer and other relevant information/calculations. 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 the above *pdf* documents in a folder. Name the folder as `< name > - < roll > - < hw7 >`. 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.)