Methods of Computational Physics - 2022, Assignment No. 03

(Date: 02 August, 2022; Due Date: 10 August, 2022)

Note: Print and file only the program listings and plots. Do not print output files of the programs, unless specifically asked in the question.

Q1 Consider a trapezium which has parallel sides equal to 2 and 1 units respectively, and the height (perpendicular distance between parallel sides) equal to 1 unit. Find the area of this trapezium with Monte Carlo hit or miss method. Use sample sizes $n = 5, 10, 20, 40, 80, \ldots, 81920$. For each value of n calculate the absolute value of the error. Print a table of three columns n, integral value and absolute error (You should format the output so that not to mant decimal figures are displayed and columns are neatly alligned). Plot integral value Vs n.

Q2 Repeat above exercise with Monte Carlo sample mean method.