

Experiment:4

INTRODUCTION TO SYMBOLIC COMPUTING

(NumPy and SymPy)

1. Write a function in Python that generates a (10x10) matrices with entries as $a_{ij} = (i + j)^2$ with i and j are random integers from 0 to 4 (where the user provides these entries as input). Additionally, within the same function, select a square sub matrix of order (5×5) from the generated matrix of random order, and then compute the result of the square of that sub matrix.
2. Define the following function in the variables x and y
 1. $f(x) = 2\sin^2(x) + \log(x)$ and evaluate f when $x = 10$ and $x = \pi$
 2. Find the derivative of $\sin(x) + x^3 + 2x + \cos(4x)$
 3. $g(x, y) = \frac{x^2}{y} + \frac{y^3}{x+y}$ and evaluate g when $x = -2$ and $y = -7$.