International Islamic University Chittagong

Department of Computer Science & Engineering

Lab Assignment -3

CSE 4746 Numerical Methods Lab

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1. The following values of f (x) are given.

x	1	2	3	4	5
y = f(x)	1	8	27	64	125

Write a program to find the first derivative and the second derivative of the function tabulated above at the point x = 1.

2. The following values of f (x) are given.

x	1	2	3	4	5
y = f(x)	1	8	27	64	125

Write a program to find the first derivative and the second derivative of the function tabulated above at the point x = 1.5.

3. Write a program to calculate the approximate area under the curve $y = \int^{5} \log_{10} x \, dx$ by using trapezoidal rule.

4. Write a program to calculate the approximate area under the curve $y = \int^{\Pi/2} e^{\sin x} dx$ by using Simpson's 1/3 rule

5. Write a program to calculate the approximate area under the curve $y = \int^{1} x / (1+x^2)$ by using Simpson's 3/8 rule.

6. Write a program to find the determinant of a 3X3 matrix.

7. Write a program to solve the following system of linear equations by using Matrix inversion method.

$$x + y + z = 1$$
$$x + 2y + 3z = 6$$
$$x + 3y + 4z = 6$$

8. Write a program to solve the following system of linear equations by using Cramer's Rule:

$$27x + 6y - z = 85$$
$$6x + 15y + 2z = 72$$
$$x + y + 54z = 110$$

9. Write a program to solve the following system of linear equations by using Gaussian Elimination method.

$$2x + y + z = 10$$
$$x + 4y + 9z = 16$$
$$3x + 2y + 3z = 18$$

10. Write a program to solve the following system of linear equations by using Gauss-Jordan Elimination method.

$$x + 2y + z = 8$$
$$2x + 3y + 4z = 20$$
$$4x + 3y + 2z = 16$$

11. Write a program to solve the following system of linear equations by using Jacobi's method.

$$83x + 11y - 4z = 95$$
$$3x + 8y + 29z = 71$$
$$7x + 52y + 13z = 104$$

12. Write a program to solve the following system of linear equations by using Gauss-Seidel method.

$$10x_1 + x_2 + x_3 = 12$$
$$2x_1 + 10x_2 + x_3 = 13$$
$$2x_1 + 2x_2 + 10x_3 = 14$$