# Bahria University,

## Karachi Campus



LAB EXPERIMENT NO.

**\_07\_**

LIST OF TASKS

|  |  |
| --- | --- |
| **TASK NO** | **OBJECTIVE** |
| 01 | 1. Write a python program implementing the Lagrange interpolation formula that considers the following data points, and find the value of y at x = 7  |  |  |  |  |  | | --- | --- | --- | --- | --- | | x | 1 | 2 | 3 | 5 | | y | 10 | 4 | 4 | 7 | |
|  |  |

Submitted On:

Date: 25/10/2024

**Task No 01:**

Write a python program implementing the Lagrange interpolation formula that considers the following data points, and find the value of y at x = 7

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| x | 1 | 2 | 3 | 5 |
| y | 10 | 4 | 4 | 7 |

**Solution:**

def lagrange\_interpolation(x, y, value):

    n = len(x)

    result = 0.0

    for i in range(n):

        term = y[i]

        for j in range(n):

            if j != i:

                term \*= (value - x[j]) / (x[i] - x[j])

        result += term

    return result

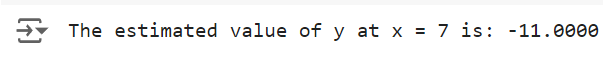
x\_values = [1, 2, 3, 5]

y\_values = [10, 4, 4, 7]

y\_at\_7 = lagrange\_interpolation(x\_values, y\_values, 7)

print(f"The estimated value of y at x = 7 is: {y\_at\_7:.4f}")

**Output:**

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