

# GROUP 7

## Lagrange Interpolation Method

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In [1]: # Importing NumPy Library
import numpy as np

# Reading number of unknowns
n = int(input('Enter number of data points: '))

# Making numpy array of n & n x n size and initializing to zero for storing x and y
a = np.zeros((n))
b = np.zeros((n))

# Reading data points

print("\nEnter data for x and y: ")
for i in range(n):
    a[i] = float(input('x['+str(i)+']='))
    b[i] = float(input('y['+str(i)+']='))

# Reading interpolation point
x = float(input("\nEnter interpolation point, x = "))

# Set interpolated value initially to zero
sm = 0

# Implementing Lagrange Interpolation
for i in range(n):

    pr = 1

    for j in range(n):
        if i != j:
            pr = pr * (x - a[j])/(a[i] - a[j])

    sm = sm + pr * b[i]

# Displaying output

print ('\nOUTPUT RESULT:\n')

print("\nInterpolated value at %.3f is equal to %.3f." % (x, sm))
```

Enter number of data points: 4

Enter data for x and y:

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x[0]=0
y[0]=5
x[1]=1
y[1]=6
x[2]=3
y[2]=50
x[3]=4
y[3]=105
```

Enter interpolation point, x = 2

OUTPUT RESULT:

Interpolated value at 2.000 is equal to 19.000.