

Inputs given to the program

Size of data set

```
Hermite_Interpolation.m
Command Window

Hermite Interpolation

Enter the size of data set :
3

NOTE: If you want a polynomial of degree <= n, then input n+1 data points.
Enter the data set. e.g. {X1,X2,...} & {f(X1),f(X2),...}.
```

Values of X

```
Enter X0 :
-1
Enter X1 :
0
Enter X2 :
1
```

Values of f(X)

```
Enter f(X0) :
1
Enter f(X1) :
1
Enter f(X2) :
3
```

Values of f'(X)

```
Enter (d/dx)f(X0) :
-5
Enter (d/dx)f(X1) :
1
Enter (d/dx)f(X2) :
7
```

Outputs of the program

Option 2 selected

Select an option.

1. Exit
2. Interpolating polynomial
3. Interpolate at a point
4. Truncation error at a Point
5. Bound on error

Your option :

2

INTERPOLATING POLYNOMIAL

ans =

$2x^4 - x^2 + x + 1$

Option 3 selected

Select an option.

1. Exit
2. Interpolating polynomial
3. Interpolate at a point
4. Truncation error at a Point
5. Bound on error

Your option :

3

Enter X where you want to interpolate :

0.3

Value of $f(0.30000) \approx 1.22620$

Option 4 Selected

Select an option.

1. Exit
2. Interpolating polynomial
3. Interpolate at a point
4. Truncation error at a Point
5. Bound on error

Your option :

4

Enter X where you want truncation error :

-0.1

The appx. error in $f(-0.10000)$ is $0.00001 * M$.

Where M is the 6th derivative of $f(X)$ at $X = -0.10000$.

Option 5 Selected

Select an option.

1. Exit
2. Interpolating polynomial
3. Interpolate at a point
4. Truncation error at a Point
5. Bound on error

Your option :

5

Bound on error = $0.00021 * M$

Where $M = \max[6\text{th derivative of } f(X); -1 \leq X \leq 1]$