

Programming Project 4 (due 11/22/2020)

Thursday, November 19, 2020 6:08 PM

Write a program that creates a [divided difference table](#) from the given data in a text file and uses that to create the interpolating polynomial. Print the polynomial in both the Newton's form and Lagrange's form.

The sample output of your program for this input file should print out the divided difference table and the interpolating polynomial as shown below:

x	f[]	f[,]	f[,,]	f[,,,]
1	3			
		1/2		
3/2	13/4		1/3	
		1/6		-2
0	3		-5/3	
		-2/3		
2	5/3			

Input file:

```
1 1.5 0 2
3 3.25 3 1.67
```

Interpolating polynomial is:

$3 + 1/2(x-1) + 1/3(x-1)(x-3/2) - 2(x-1)(x-3/2)x$

[Simplified polynomial](#) is:

$-2x^3 + 5.334x^2 - 3.334x + 3$

Your program should work on any data (at most 50 node points) and not just the above sample data.

Points distribution: 50% for printing out the correct divided difference table, 25% for printing the correct polynomial in un-simplified form and 25% for printing the polynomial in simplified form.

Submission details:

Upload the source code and executable(if in C++) of your program and any other sample txt file that you have tested your program with apart from the one that I have provided.