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Lab 5

Data Analysis

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In this lab the goal was to take nine initial x-values and use the function…

$$f(x) = \frac{1}{x^2 + 1}$$

To evaluate for f(x) then form and test a Newton Interpolate based on the points. The program that was designed initially found the points then determined a divided difference table (DDT). This DDT was used to evaluate the nested polynomial formed by the Newton Interpolate. The data from the assigned points is below…

Initial values: -8, -6, -4, -2, 0, 2, 4, 6, 8   tested on Xi = [-8,8] ∊ Z

i	Xi	f(Xi)	P(Xi)	|f(Xi)-P(Xi)|
0	-8	0.0153846154	0.0153846154	0.0000000000
1	-7	0.0200000000	-1.3682034976	1.3882034976
2	-6	0.0270270270	0.0270270270	0.0000000000
3	-5	0.0384615385	0.4198361257	0.3813745873
4	-4	0.0588235294	0.0588235294	0.0000000000
5	-3	0.1000000000	-0.1288247524	0.2288247524
6	-2	0.2000000000	0.2000000000	0.0000000000
7	-1	0.5000000000	0.7426929192	0.2426929192
8	0	1.0000000000	1.0000000000	0.0000000000
9	1	0.5000000000	0.7426929192	0.2426929192
10	2	0.2000000000	0.2000000000	0.0000000000
11	3	0.1000000000	-0.1288247524	0.2288247524
12	4	0.0588235294	0.0588235294	0.0000000000
13	5	0.0384615385	0.4198361257	0.3813745873
14	6	0.0270270270	0.0270270270	0.0000000000
15	7	0.0200000000	-1.3682034976	1.3882034976
16	8	0.0153846154	0.0153846154	0.0000000000

List of items learned

- Divided Difference Table
- Newton Interpolate
- C++ practice
- Calculating absolute error practice