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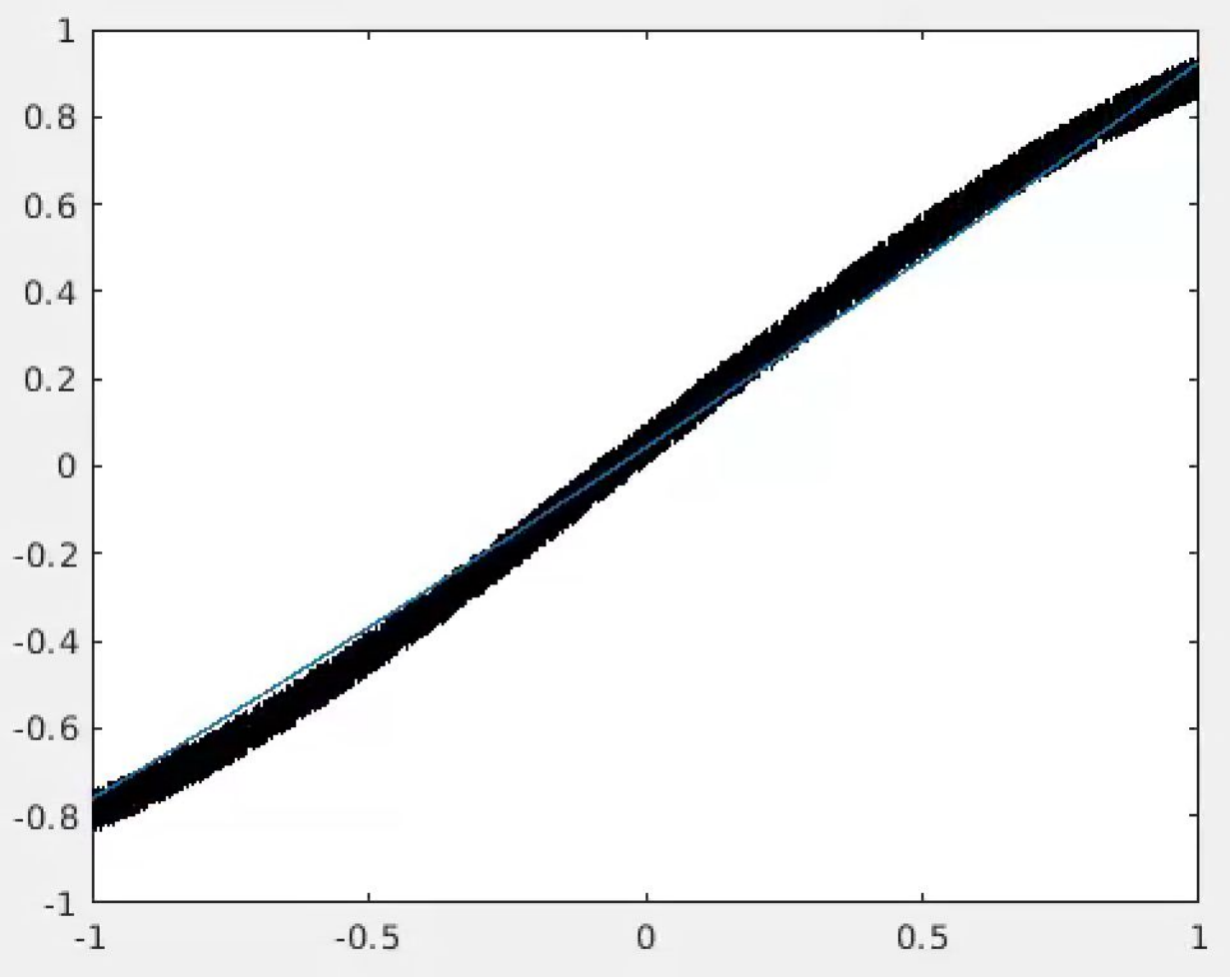
April 16, 2016
Assignment 4
CS 3200

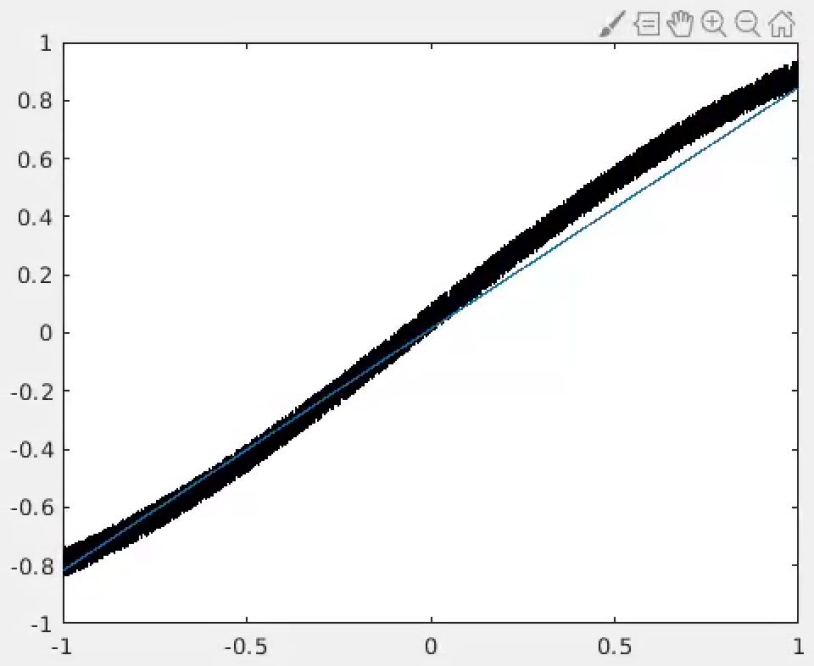
Assignment 4

A) The solution is in VandermondePolyInterp.m
B) The solution is in VandermondePolyInterp.m
C)

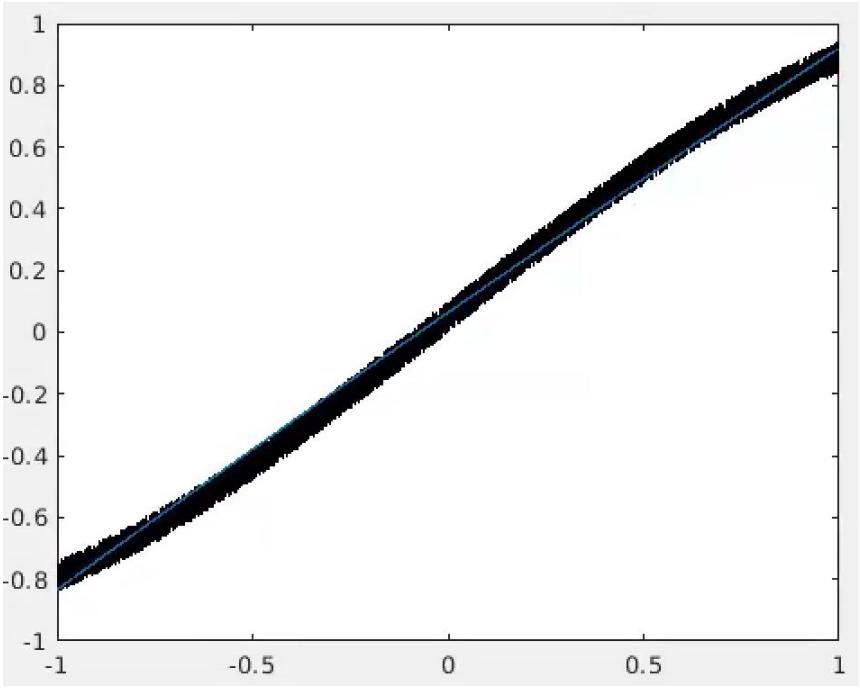
N = 3, L = N - 1



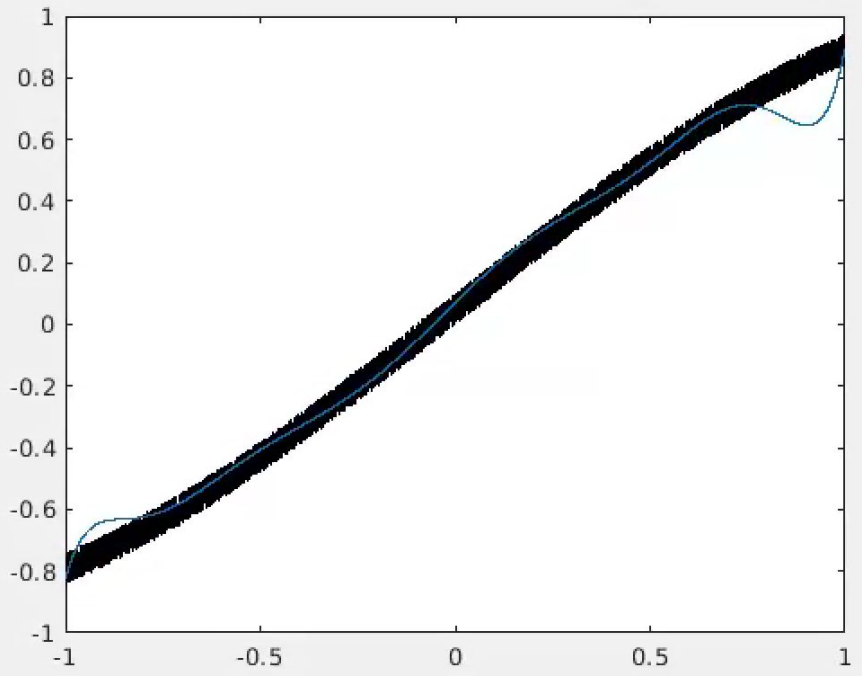
N = 3, L = 1


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.5
0
0.5
1

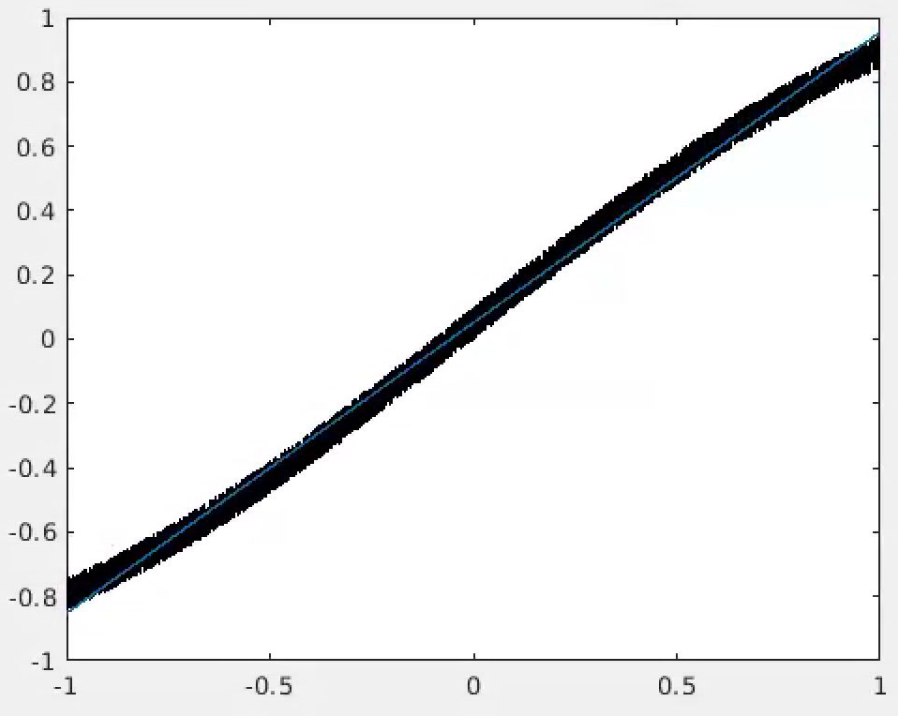
N = 3, L = 2


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.5
0
0.5
1

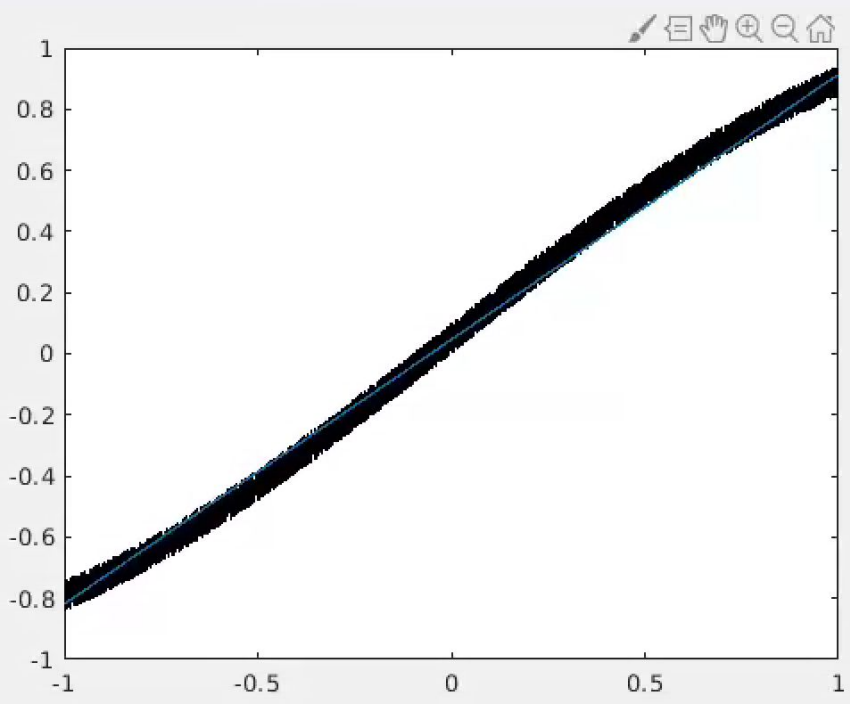
N = 10, L = N - 1



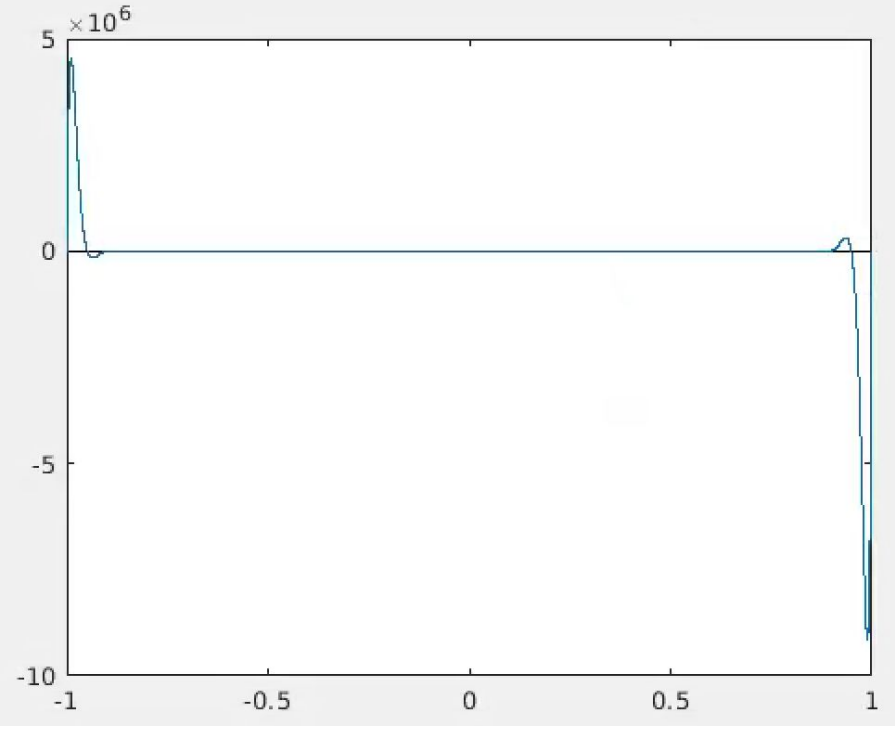
N = 10, L = 1



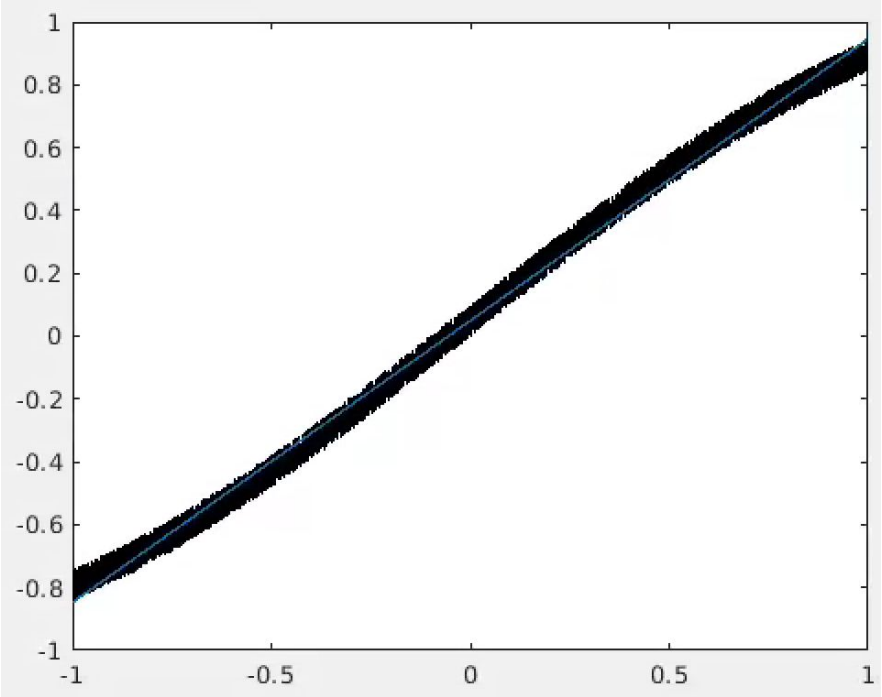
N = 10, L = 2



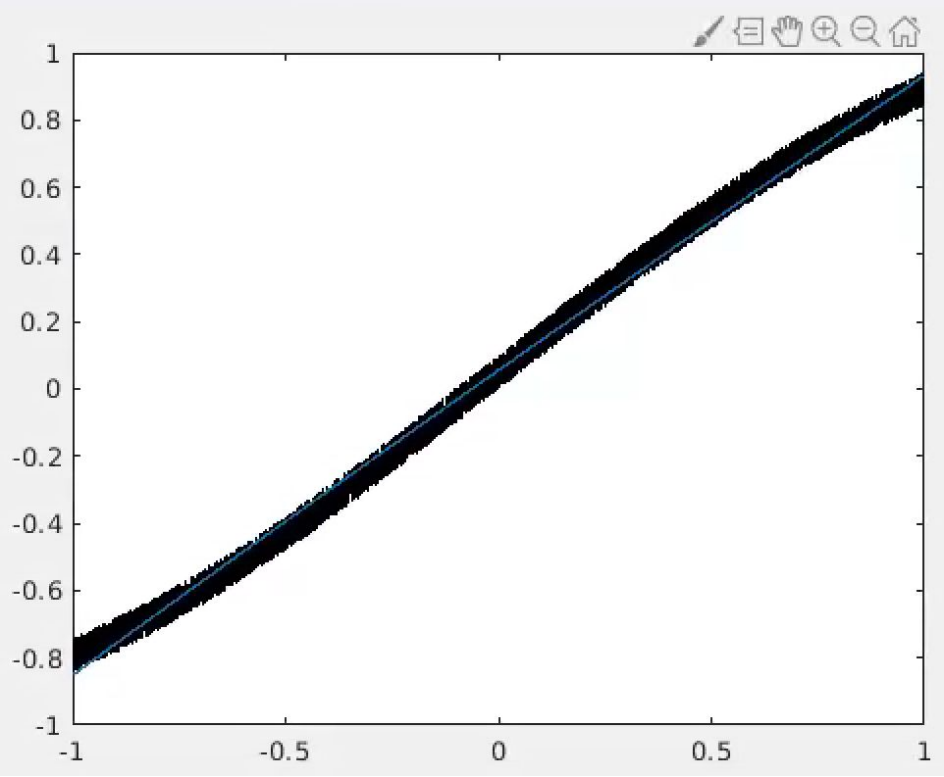
N = 40, L = N - 1



N = 40, L = 1


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.5
0
0.5
1

N = 40, L = 2


1
0.8
0.6
0.4
0.2
0
-0.2
-0.4
-0.6
-0.8
-1
-1
-0.5
0
0.5
1

Compare these plots and discuss the effect of l on the quality of fit visually.

So if N is small, then the l you choose does not matter much, most will give you ok results. The larger the N the more that the l you choose will matter. If N is big then you would have to choose a small l, otherwise the results get really inaccurate.

D) If we were to measure relative error, should relative errors be measured against f(x) or just sin(x)?

We should use f(x) because it's the actual function with the noise, the relative error calculated will have the error noise into account. Also you will not know that it is sin(x) in real life.