

# DS284-Numerical Linear Algebra - Assignment 4

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# Answer 1

Fitting a 14th degree polynomial to the datapoints with MGS QR factorization

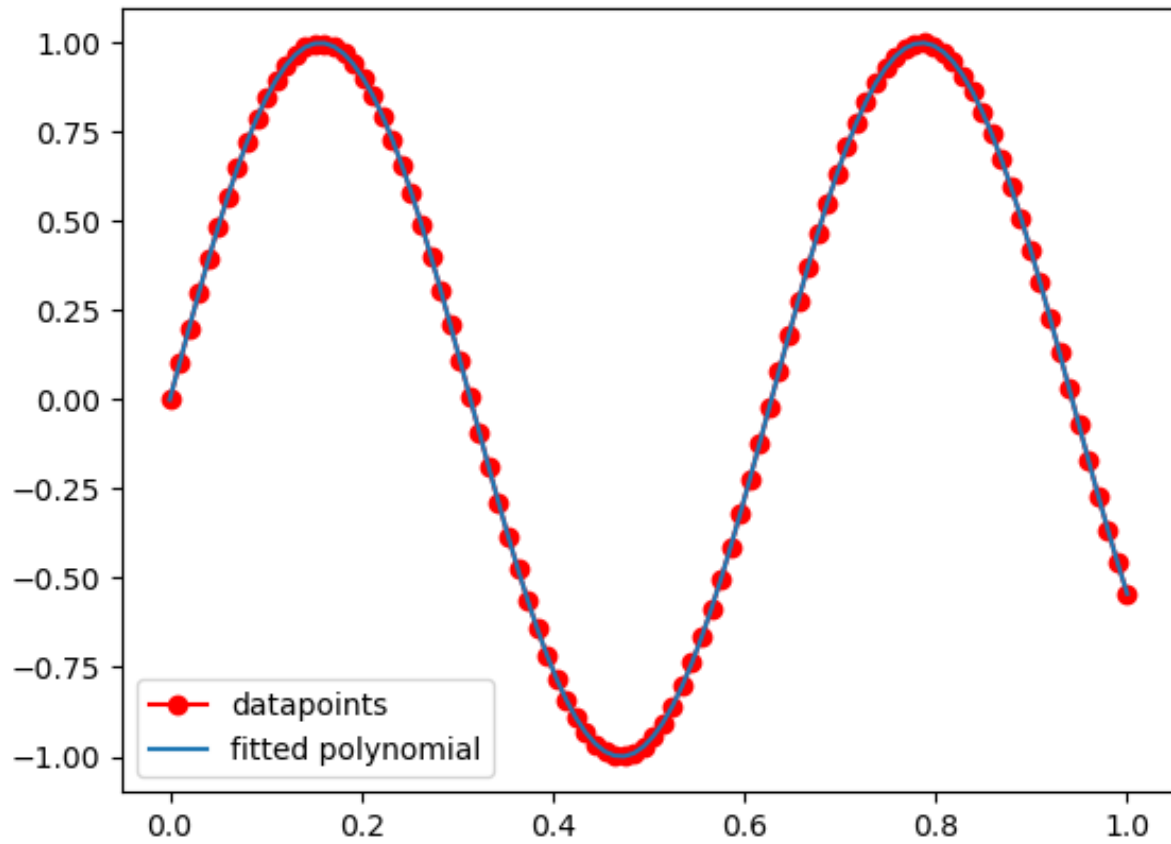


Figure 1: error= 66.47188248164618

ing a 14th degree polynomial to the datapoints with Householder QR factoriz

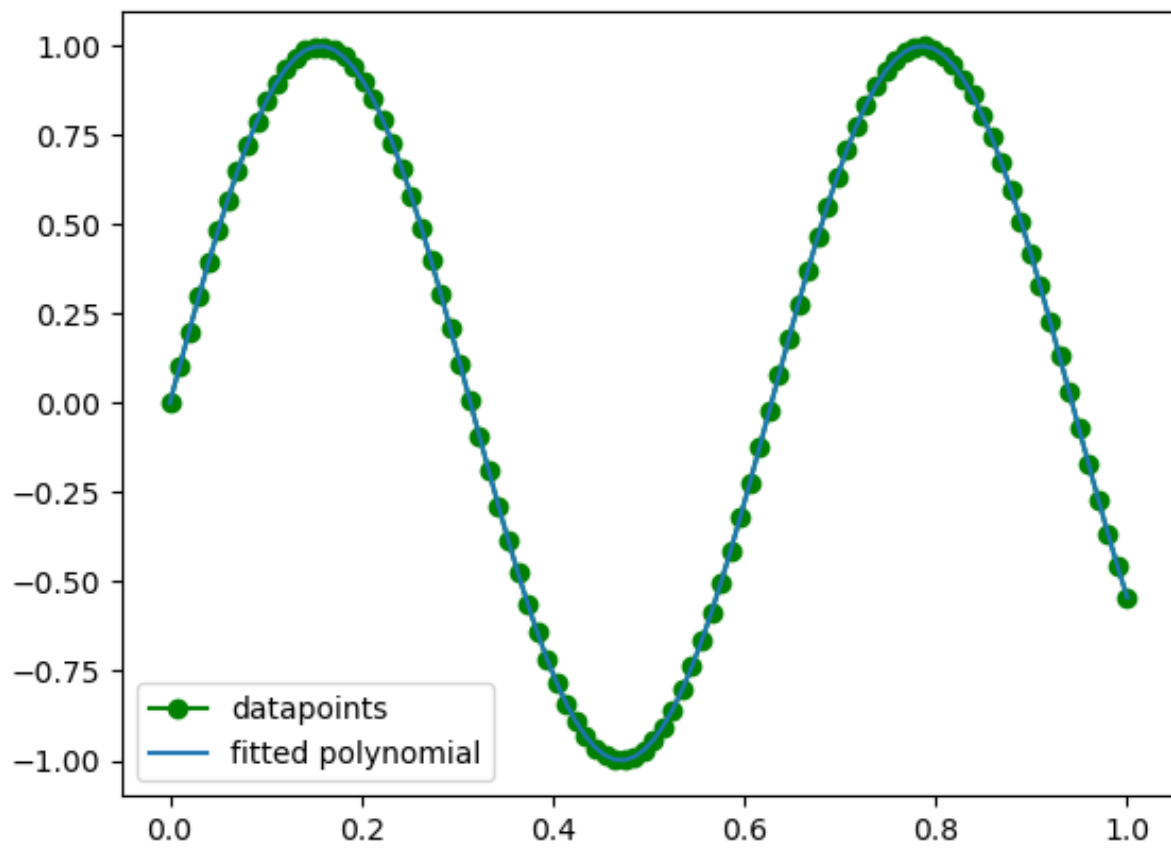


Figure 2: error= 66.47188248158425

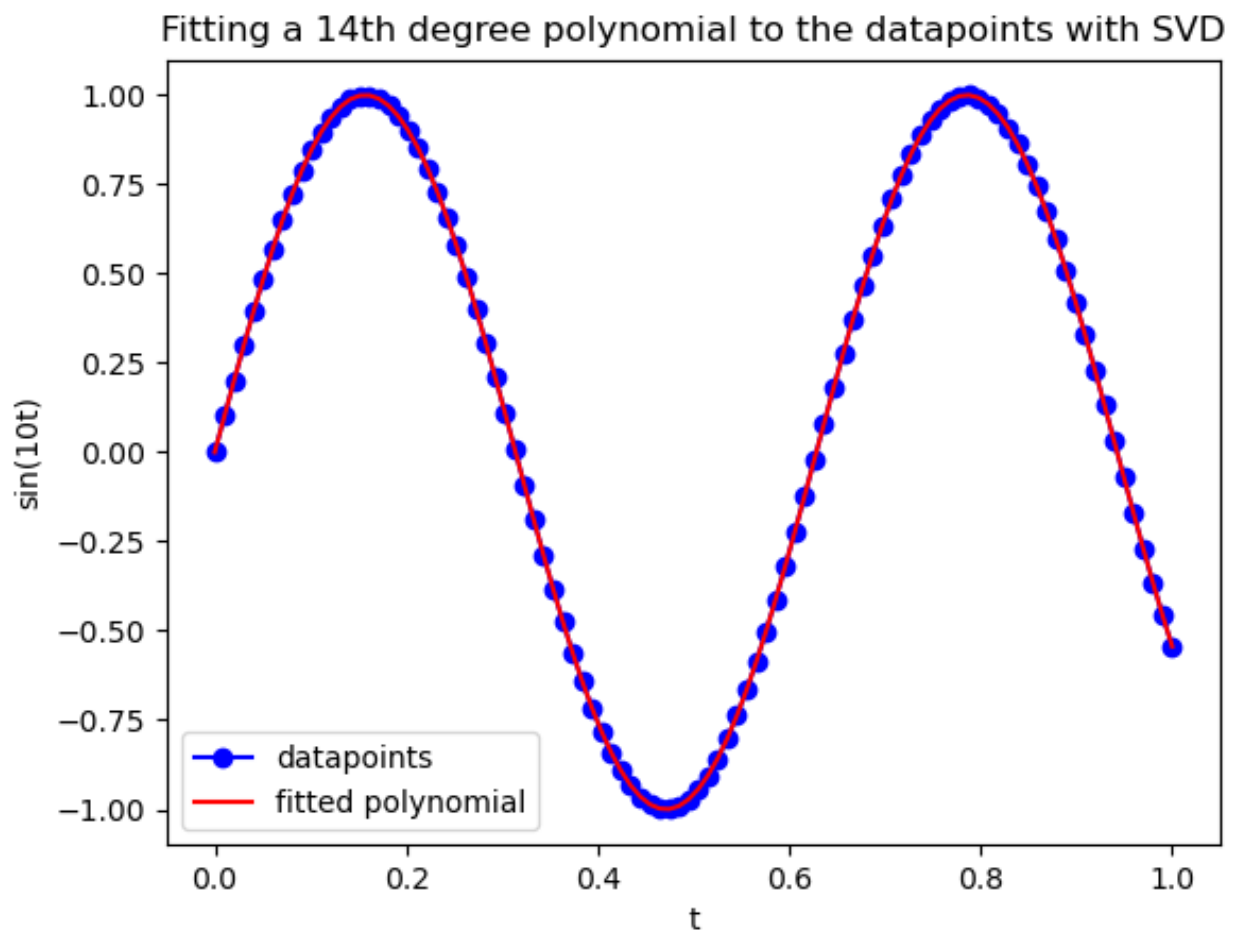


Figure 3: error= 66.47188248158271

Fitting a 14th degree polynomial to the datapoints with normal equations

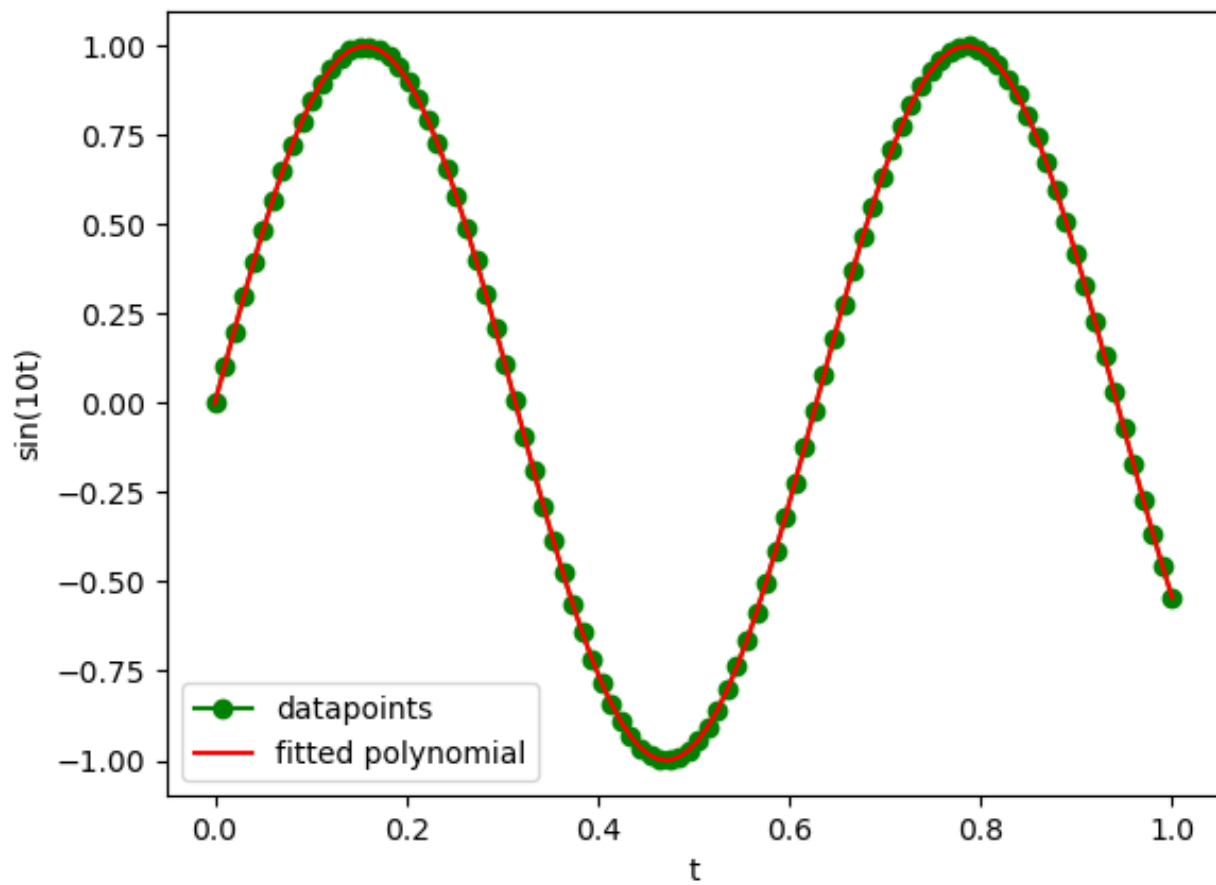


Figure 4: error= 66.47188275756871

**maximum error** is 66.47188275756871 occurred in Normal equations.

**minimum error** is 66.47188248158271 occurred in SVD.

Upto 6 digits after decimal in the values of error, its the same. Thus, we need to set the tolerance more than  $10^{-6}$  to achieve high degree of accuracy to compare among the several methods for solving the least squares problem.