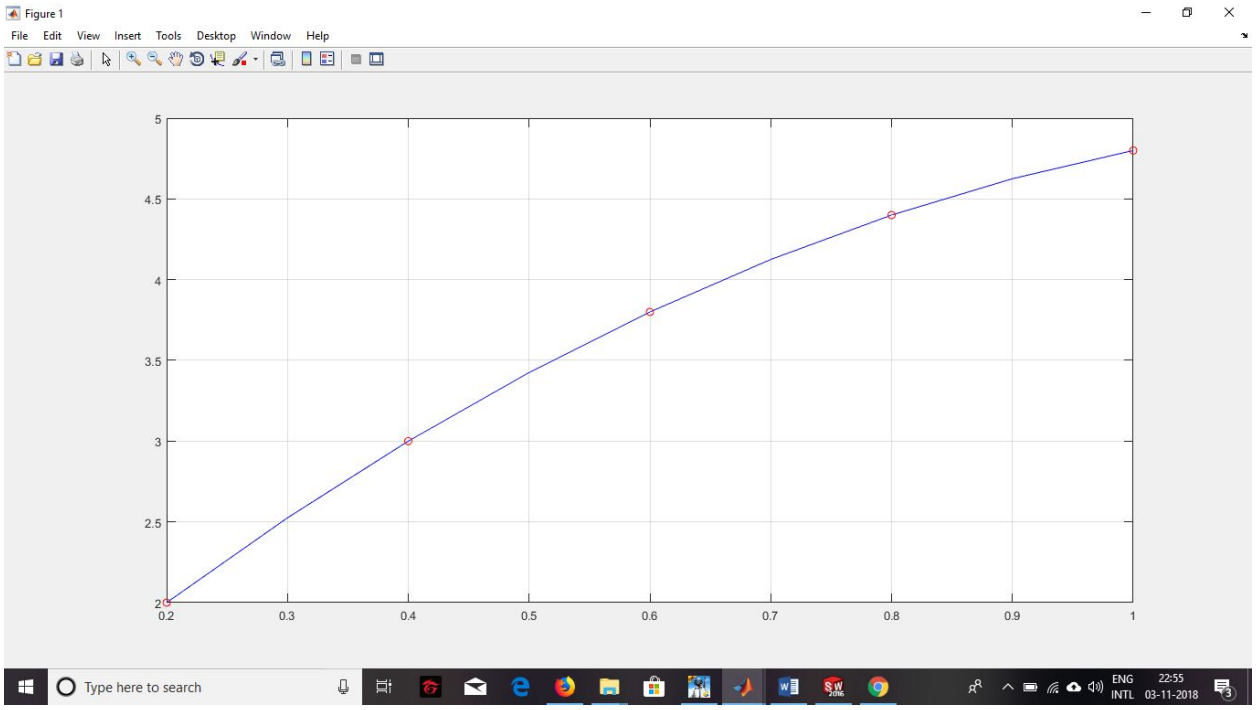
PA-3

a)Polynomial least square:-

5

0.2 0.4 0.6 0.8 1

2 3 3.8 4.4 4.8



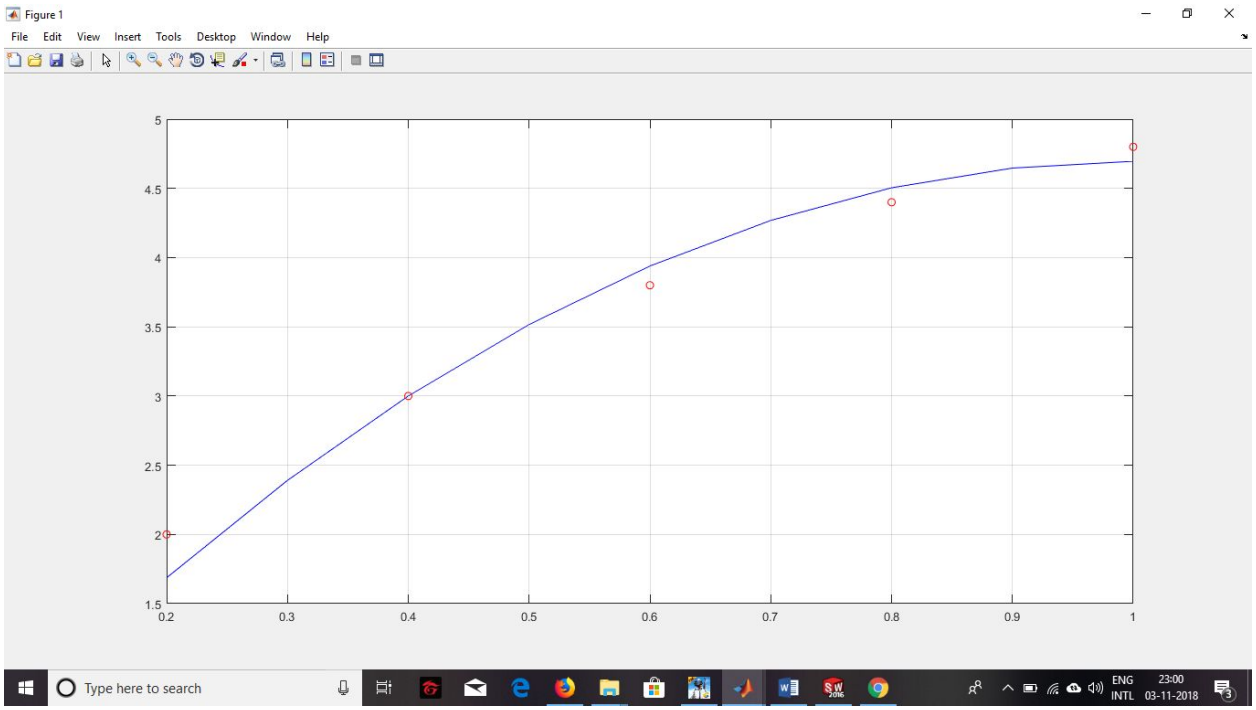
Coeff:-

a=0.800000000000014

b=6.499999999999941

c=-2.499999999999953

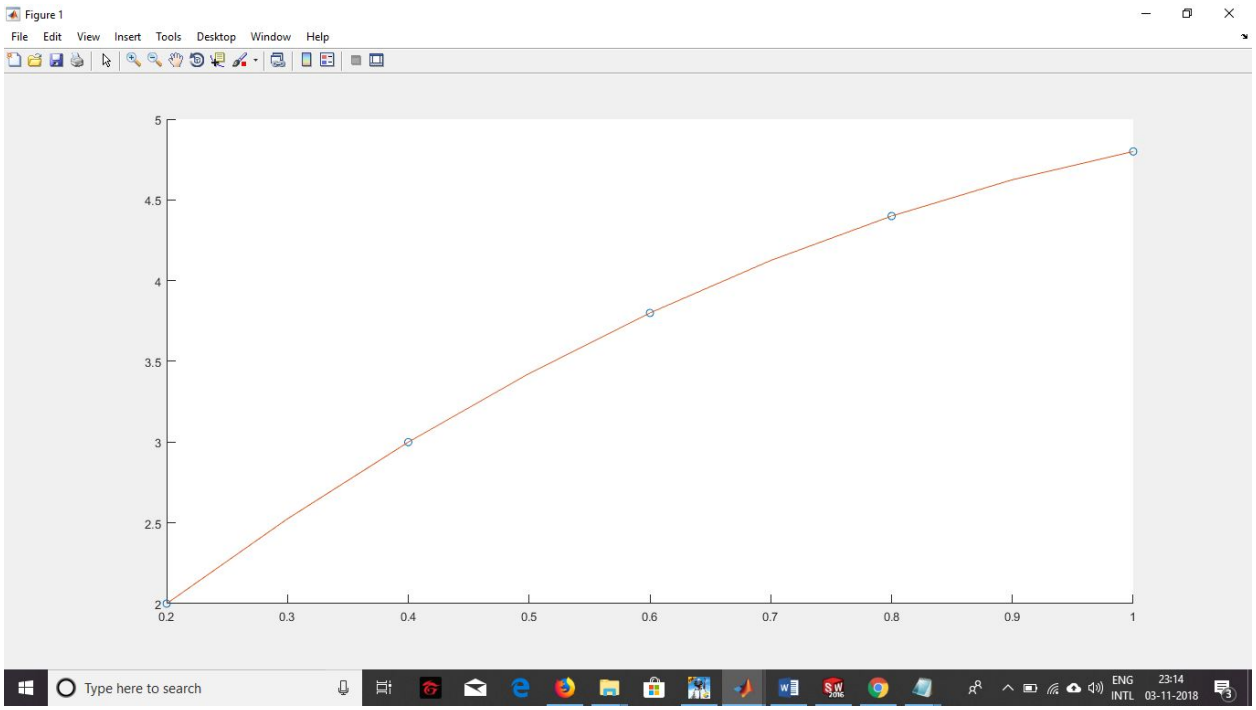
When intercept is zero:-



The Coefficients are a1 9.3696
The Coefficients are a2 -4.6739
The value or r_square is 0.972428

B)Lagrange Interpolation:-

5
0.2 0.4 0.6 0.8 1
2 3 3.8 4.4 4.8



C)Cubic Splines:-

4

0 2 4 8

1 0.7937 0.63 0.3968

1.Natural Spline

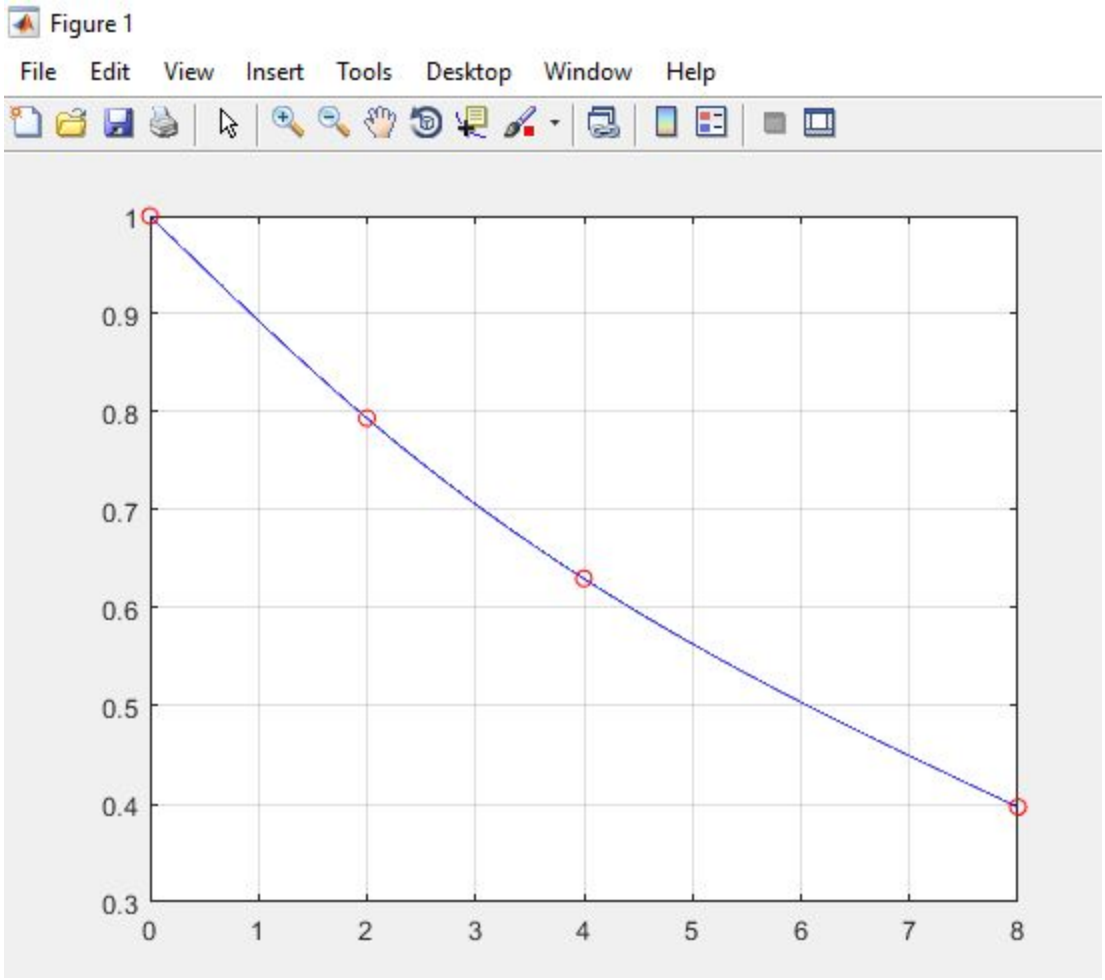
The Interval for Interpolation 0.000000 to 2.000000

The Coefficients are a3 = 0.0011 a2 = 0.0000 a1 = -0.1077 a0 = 1.0000

The Value of the first derivative at first node is -0.1077 and at second node is -0.0941

The Value of the second derivative at first node is 0.0000 and at second node is 0.0136

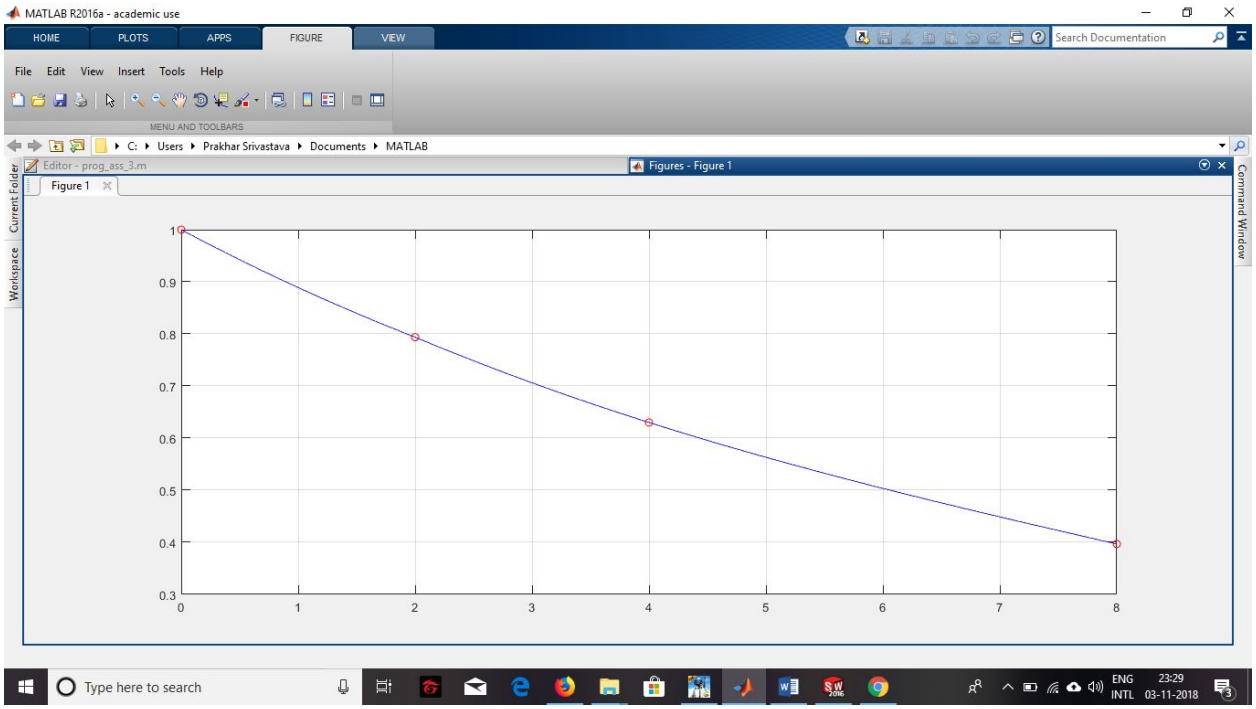
The Interval for Interpolation 2.000000 to 4.000000
The Coefficients are a3 = -0.0003 a2 = -0.0088 a1 = -0.1254 a0 = 1.0118
The Value of the first derivative at first node is -0.1648 and at second node is -0.2125
The Value of the second derivative at first node is 0.0136 and at second node is 0.0095
The Interval for Interpolation 4.000000 to 8.000000
The Coefficients are a3 = -0.0004 a2 = -0.0095 a1 = -0.1280 a0 = 1.0153
The Value of the first derivative at first node is -0.2231 and at second node is -0.3562
The Value of the second derivative at first node is 0.0095 and at second node is 0.0000



2)Not-a-Knot

The Interval for Interpolation 0.000000 to 2.000000
The Coefficients are a3 = -0.0004 a2 = -0.0090 a1 = -0.1197 a0 = 1.0000
The Value of the first derivative at first node is -0.1197 and at second node is -0.1601
The Value of the second derivative at first node is 0.0180 and at second node is 0.0137
The Interval for Interpolation 2.000000 to 4.000000

The Coefficients are a3 = -0.0004 a2 = -0.0090 a1 = -0.1257 a0 = 1.0120
The Value of the first derivative at first node is -0.1661 and at second node is -0.2151
The Value of the second derivative at first node is 0.0137 and at second node is 0.0093
The Interval for Interpolation 4.000000 to 8.000000
The Coefficients are a3 = -0.0004 a2 = -0.0090 a1 = -0.1257 a0 = 1.0120
The Value of the first derivative at first node is -0.2151 and at second node is -0.3393
The Value of the second derivative at first node is 0.0093 and at second node is 0.0006



3)Periodic

The Interval for Interpolation 0.000000 to 2.000000

The Coefficients are a3 = 0.0007 a2 = -0.0025 a1 = -0.1110 a0 = 1.0000

The Value of the first derivative at first node is -0.1110 and at second node is -0.1127

The Value of the second derivative at first node is 0.0050 and at second node is 0.0135

The Interval for Interpolation 2.000000 to 4.000000

The Coefficients are a3 = -0.0007 a2 = -0.0109 a1 = -0.1278 a0 = 1.0112

The Value of the first derivative at first node is -0.1799 and at second node is -0.2488

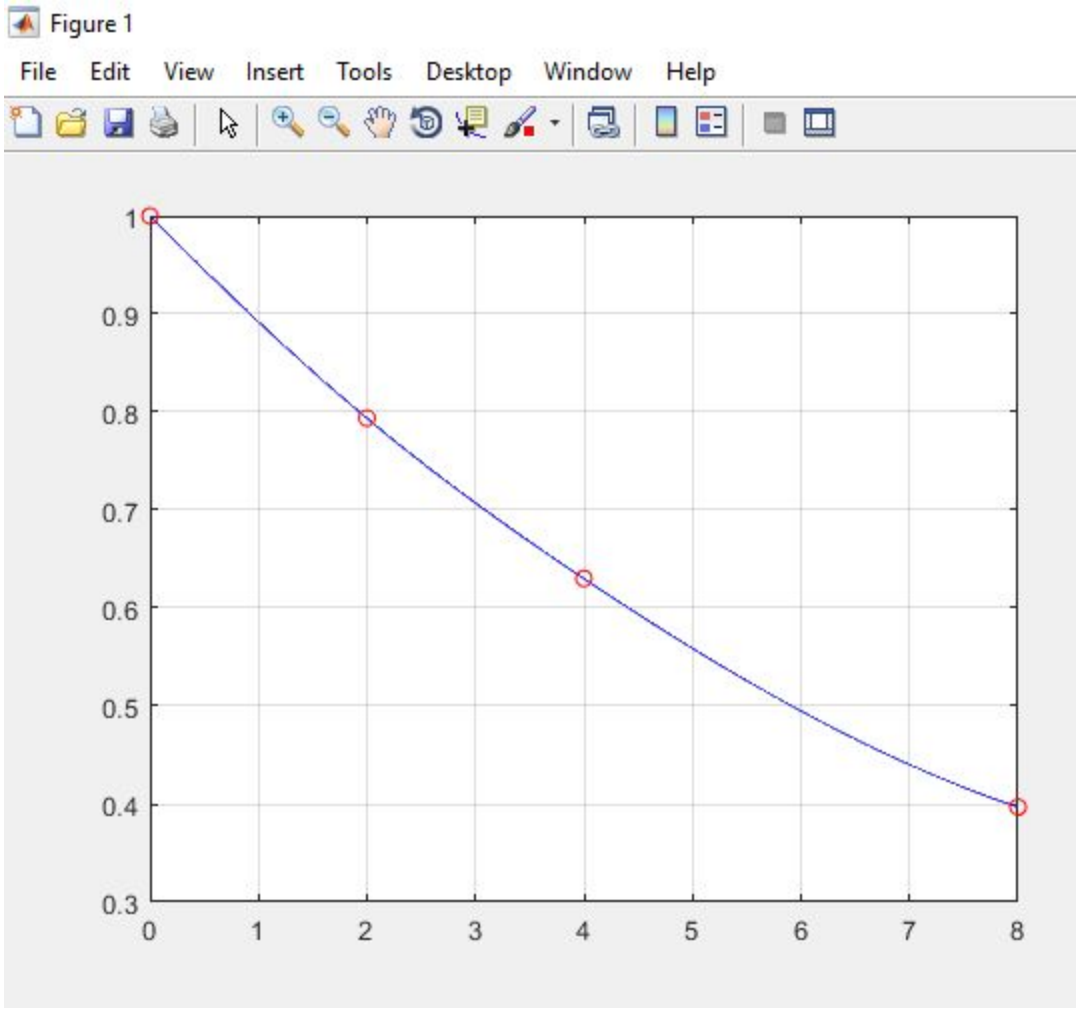
The Value of the second derivative at first node is 0.0135 and at second node is 0.0050

The Interval for Interpolation 4.000000 to 8.000000

The Coefficients are a3 = 0.0004 a2 = 0.0017 a1 = -0.0774 a0 = 0.9440

The Value of the first derivative at first node is -0.0472 and at second node is 0.0166

The Value of the second derivative at first node is 0.0050 and at second node is 0.0135



4)Clamped:-

Derivative at first node=4

Derivative at second node=6

The Interval for Interpolation 0.000000 to 2.000000

The Coefficients are a3 = 0.8168 a2 = 3.6851 a1 = 4.0000 a0 = 1.0000

The Value of the first derivative at first node is 4.0000 and at second node is 28.5414

The Value of the second derivative at first node is -7.3702 and at second node is 2.4309
The Interval for Interpolation 2.000000 to 4.000000
The Coefficients are a3 = -0.3934 a2 = -3.5757 a1 = -10.5215 a0 = 10.6810
The Value of the first derivative at first node is -29.5447 and at second node is -58.0087
The Value of the second derivative at first node is 2.4309 and at second node is -2.2895
The Interval for Interpolation 4.000000 to 8.000000
The Coefficients are a3 = 0.3324 a2 = 5.1338 a1 = 24.3163 a0 = -35.7695
The Value of the first derivative at first node is 81.3427 and at second node is 170.2812
The Value of the second derivative at first node is -2.2895 and at second node is 5.6885

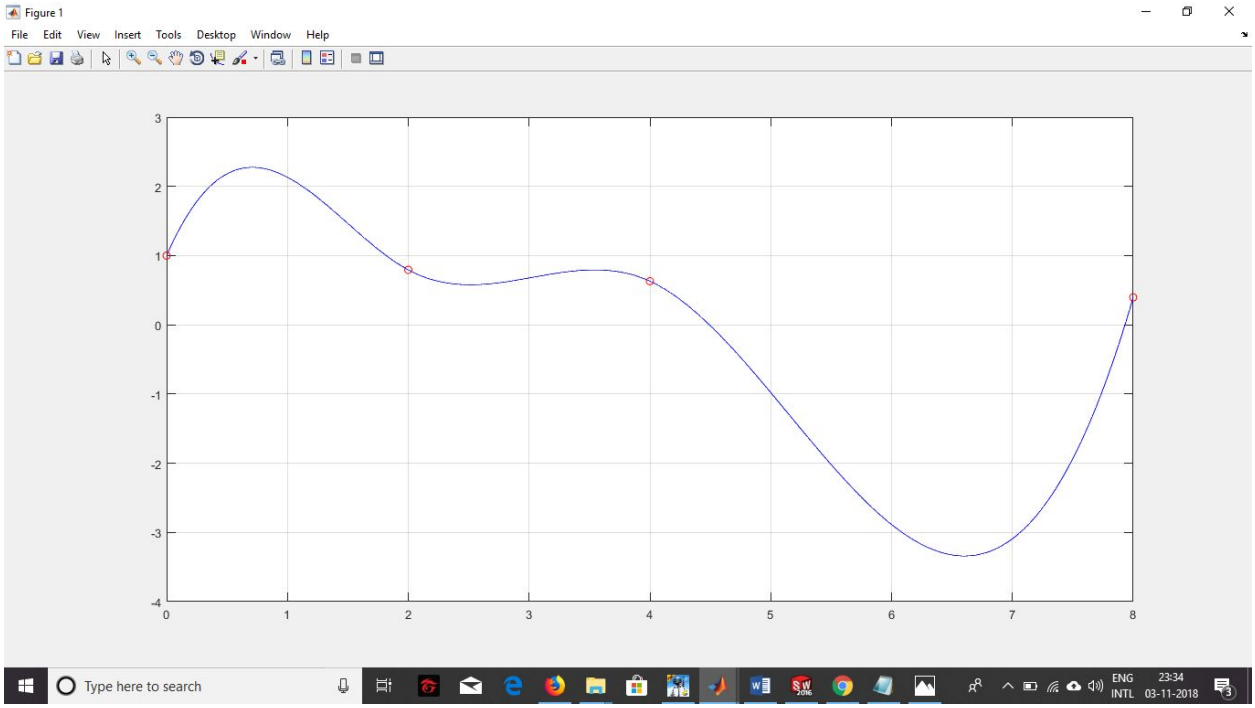


Figure 1
File Edit View Insert Tools Desktop Window Help
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