Least Square

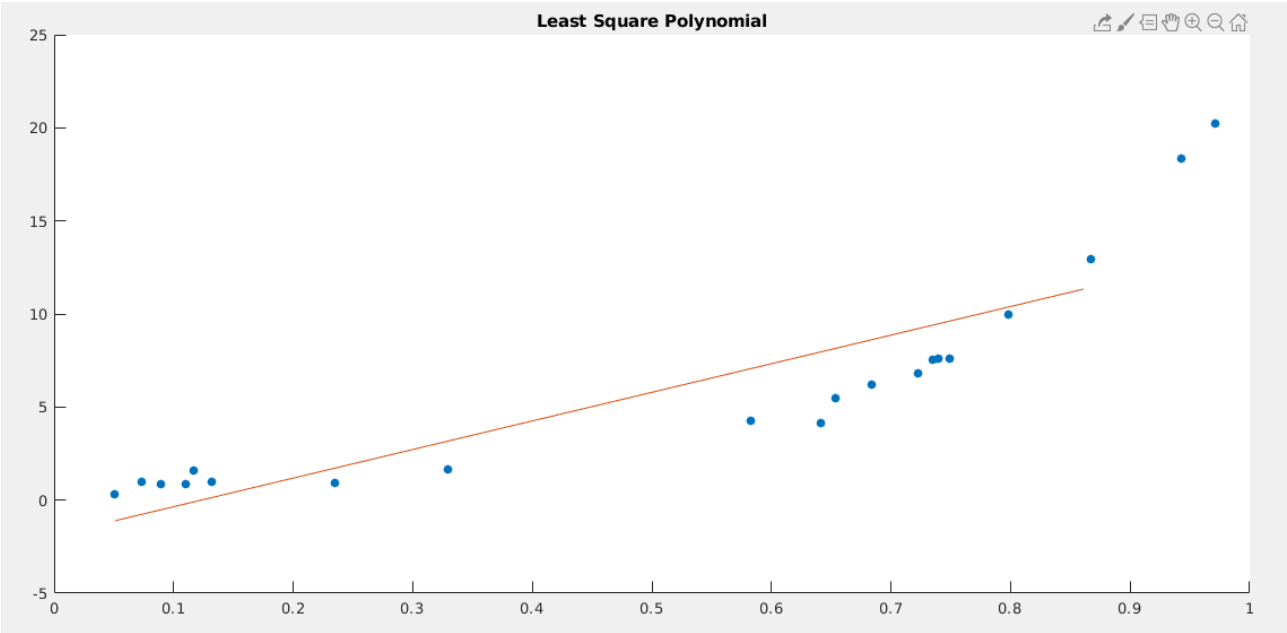
Output: (Linear)

Least Square Interpolation Polynomial.....

Coefficients of the Polynomial :

15.363890 -1.889820

R-sq = 0.757172



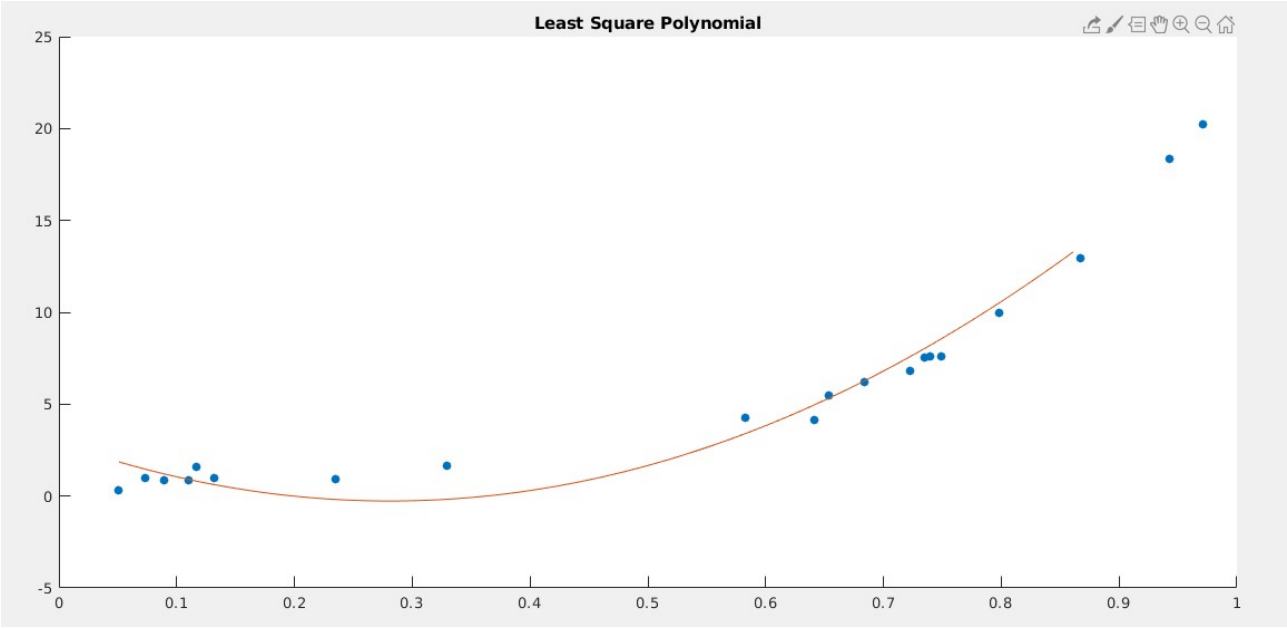
Output: (Quadratic)

LeastSquare Interpolation Polynomial.....

Coefficients of the Polynomial :

40.279459 -22.625813 2.907038

R-sq = 0.976508



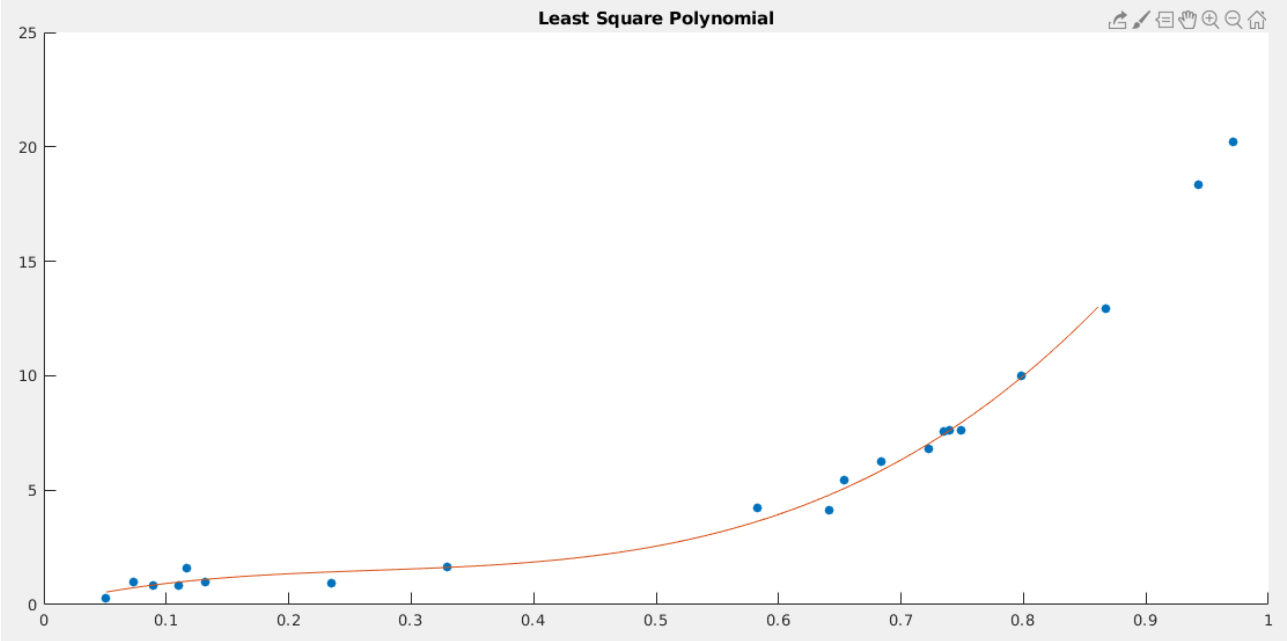
Output: (Cubic)

LeastSquare Interpolation Polynomial.....

Coefficients of the Polynomial :

50.261700 -40.709692 12.917014 -0.009668

R-sq = 0.996541



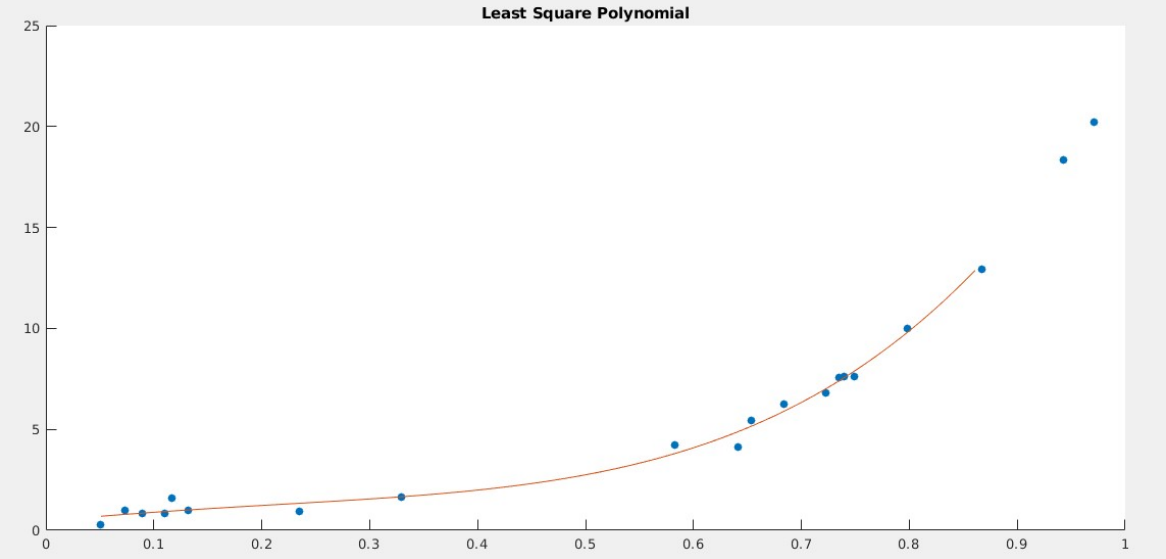
Output: (Quartic)

LeastSquare Interpolation Polynomial.....

Coefficients of the Polynomial :

26.746661 -4.250426 -4.972829 4.773275 0.465837

R-sq = 0.996784



Splines

Output: (Linear spline)

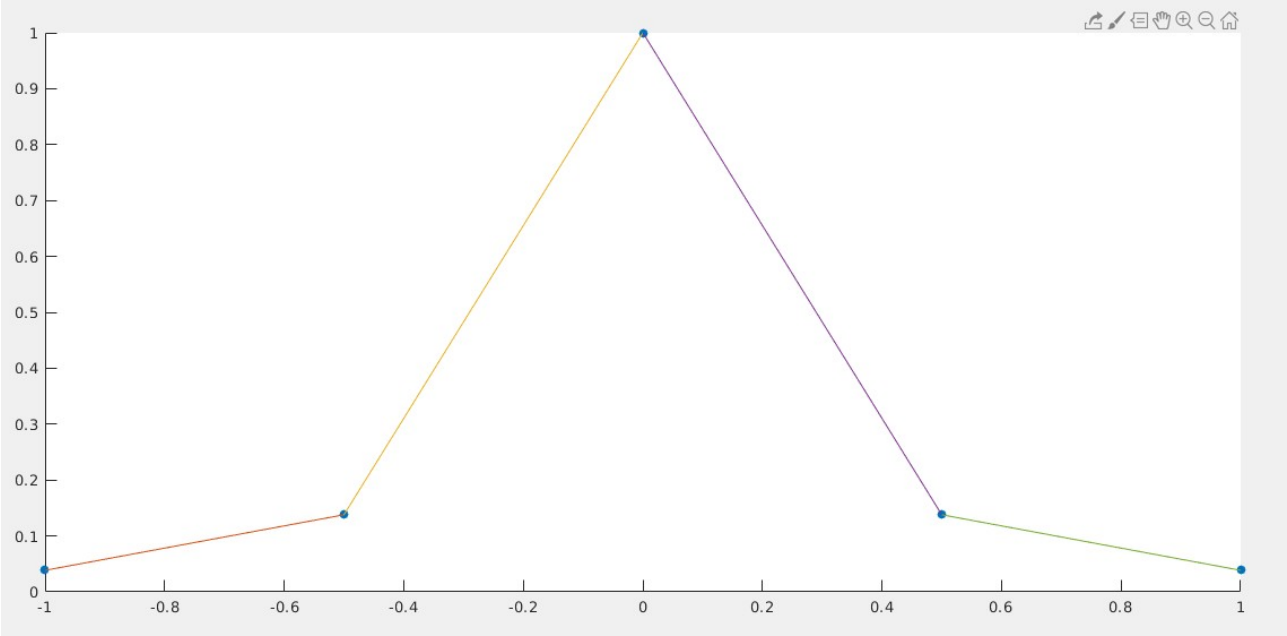
+++ Output of Linear Spline Interpolation on given data set. +++

Coefficients of the equations in tabular form :

i	c1	c0
1	0.198800	0.237300
2	1.724200	1.000000
3	-1.724200	1.000000
4	-0.198800	0.237300

Interpolated values y* at give x* :

x*	y*
-0.800	0.078260
-0.200	0.655160
0.200	0.655160
0.800	0.078260



Output:(Natural spline)

Coefficients of the equations in tabular form :

i	c3	c2	c1	c0
1	2.728571	8.185714	7.702371	2.283729
2	-7.541257	-7.219029	-0.000000	1.000000
3	7.541257	-7.219029	0.000000	1.000000
4	-2.728571	8.185714	-7.702371	2.283729

1st derivative and 2nd derivative at each node :

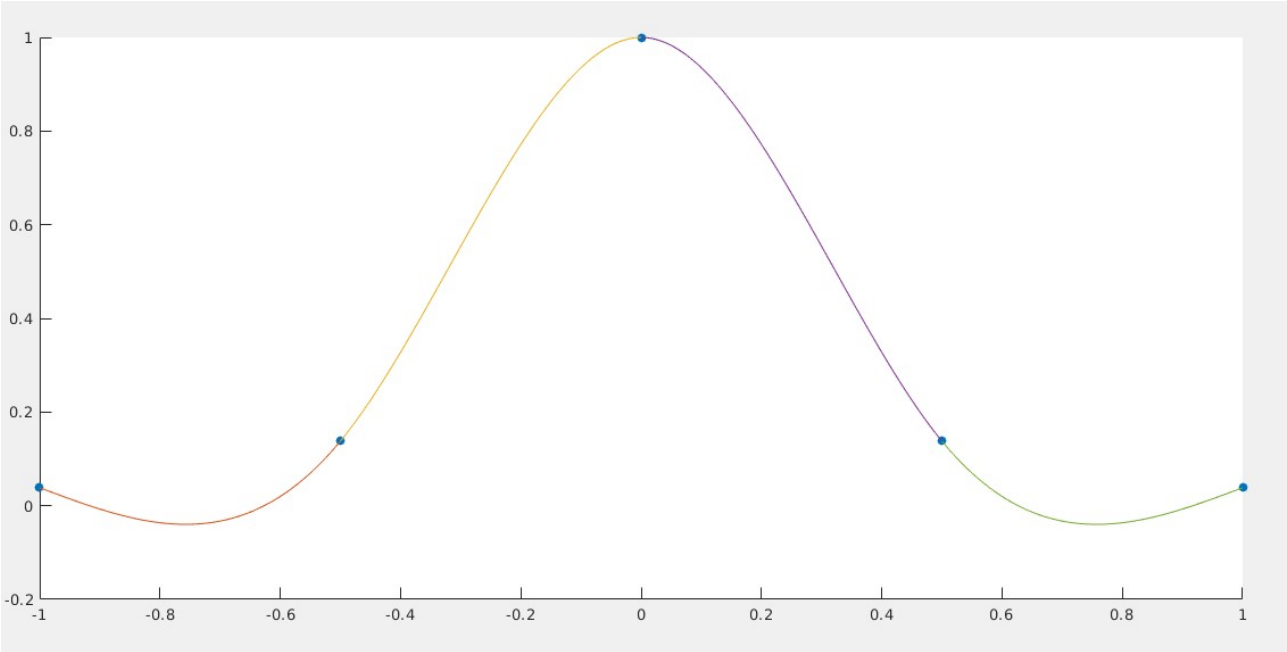
i	1st der	2nd der
0	-0.483343	0.000000
1	1.563086	8.185714

2 0.000000 -14.438057
3 -1.563086 8.185714
4 0.483343 0.000000

Interpolated values y* at give x* :

x* y*

-0.800 -0.036340
-0.200 0.771569
0.200 0.771569
0.800 -0.036340



Output:(Not a knot spline)

Coefficients of the equations in tabular form :

i c3 c2 c1 c0

1 -4.973800 -5.935300 0.000000 1.000000
2 -4.973800 -5.935300 -0.000000 1.000000
3 4.973800 -5.935300 0.000000 1.000000
4 4.973800 -5.935300 -0.000000 1.000000

1st derivative and 2nd derivative at each node :

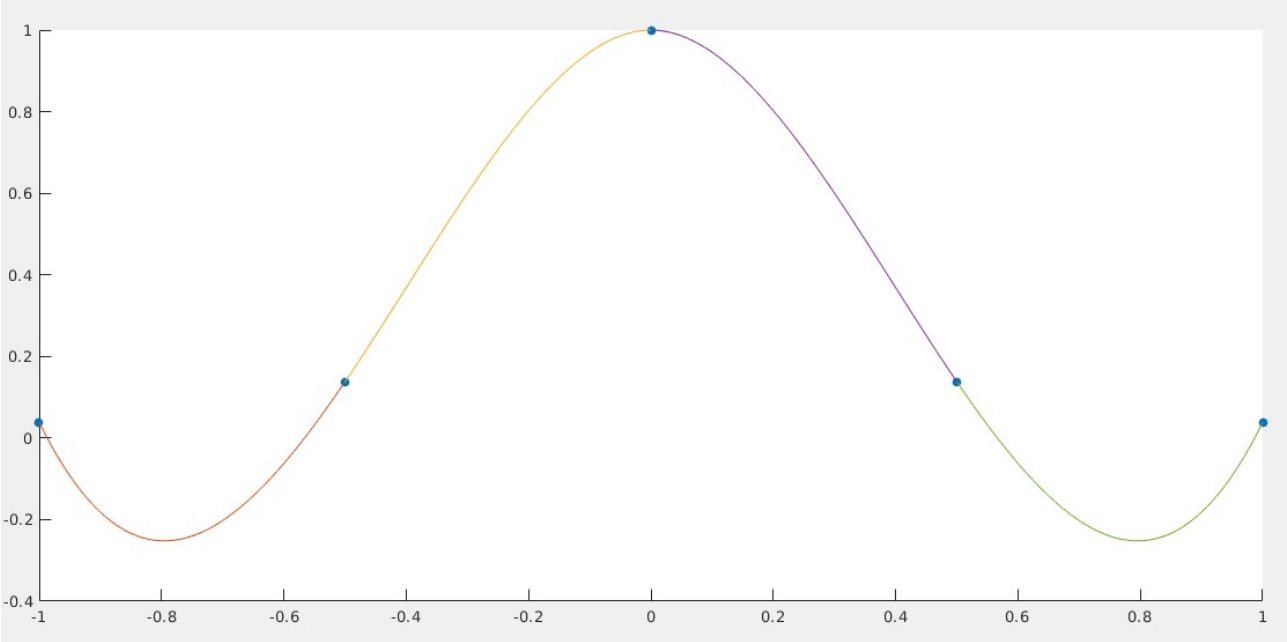
i 1st der 2nd der

0 -3.050800 17.972200
1 2.204950 3.050800
2 0.000000 -11.870600
3 -2.204950 3.050800
4 3.050800 17.972200

Interpolated values y* at give x* :

x* y*

-0.800 -0.252006
-0.200 0.802378
0.200 0.802378
0.800 -0.252006



Output:(Quadratic Spline)

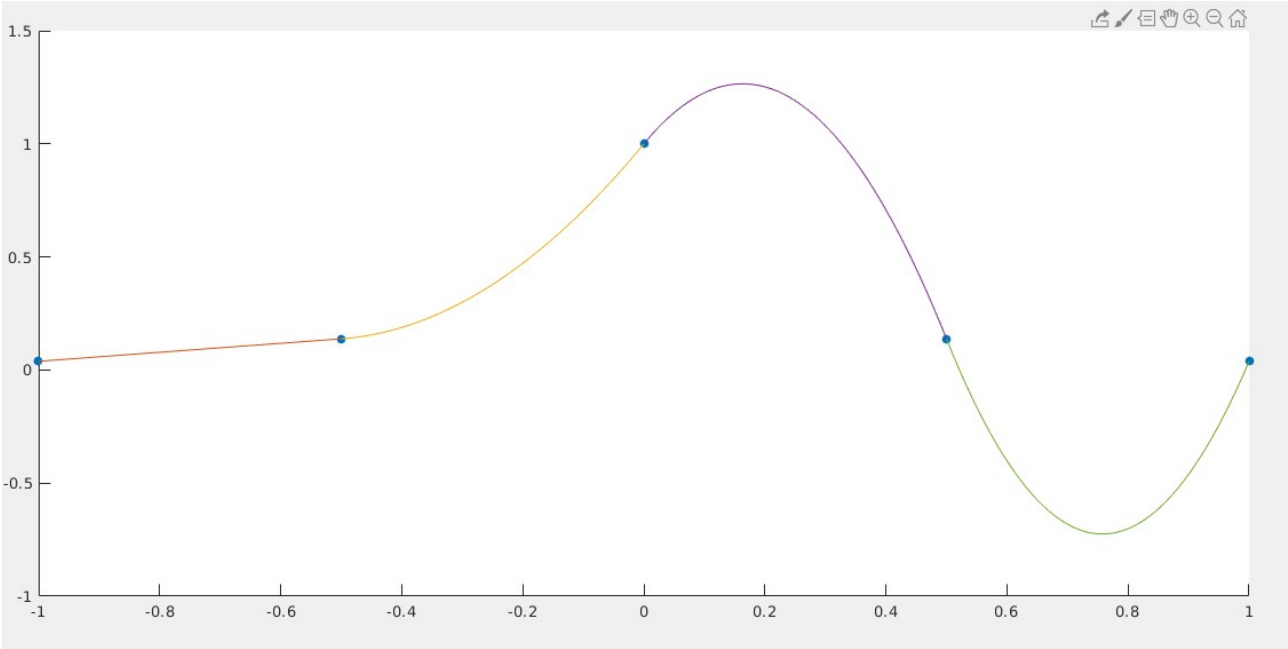
+++ Output of Quadratic Spline Interpolation on given data set. +++

Coefficients of the equations in tabular form :

i	c2	c1	c0
1	-0.002400	0.195200	0.236100
2	3.053200	3.250800	1.000000
3	-9.950000	3.250800	1.000000
4	13.000800	-19.700000	6.737700

Interpolated values y* at give x* :

x*	y*
-0.800	0.078404
-0.200	0.471968
0.200	1.252160
0.800	-0.701788



Output:(Periodic Spline)

Coefficients of the equations in tabular form :

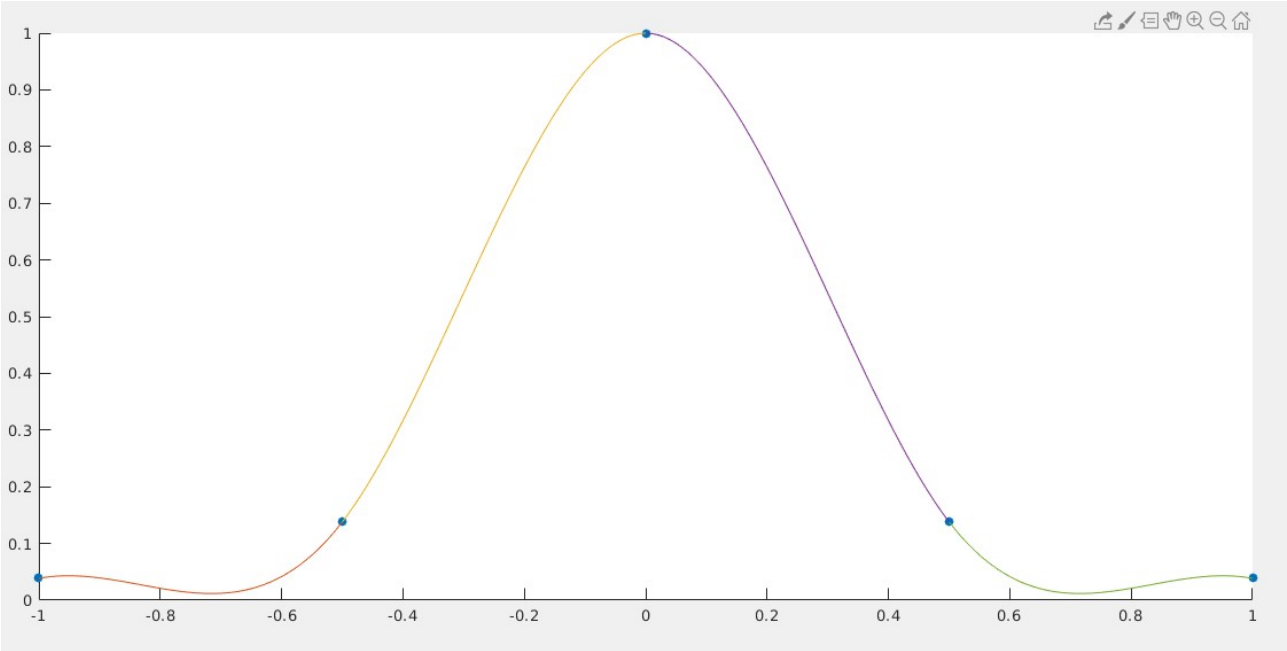
i	c3	c2	c1	c0
1	4.775000	11.937500	9.748800	2.624800
2	-8.223400	-7.560100	0.000000	1.000000
3	8.223400	-7.560100	0.000000	1.000000
4	-4.775000	11.937500	-9.748800	2.624800

1st derivative and 2nd derivative at each node :

i	1st der	2nd der
0	0.198800	-4.775000
1	1.392550	9.550000
2	0.000000	-15.120200
3	-1.392550	9.550000
4	-0.198800	-4.775000

Interpolated values y* at give x* :

x*	y*
-0.800	0.020960
-0.200	0.763383
0.200	0.763383
0.800	0.020960



Output: (Clamped Spline)

Coefficients of the equations in tabular form :

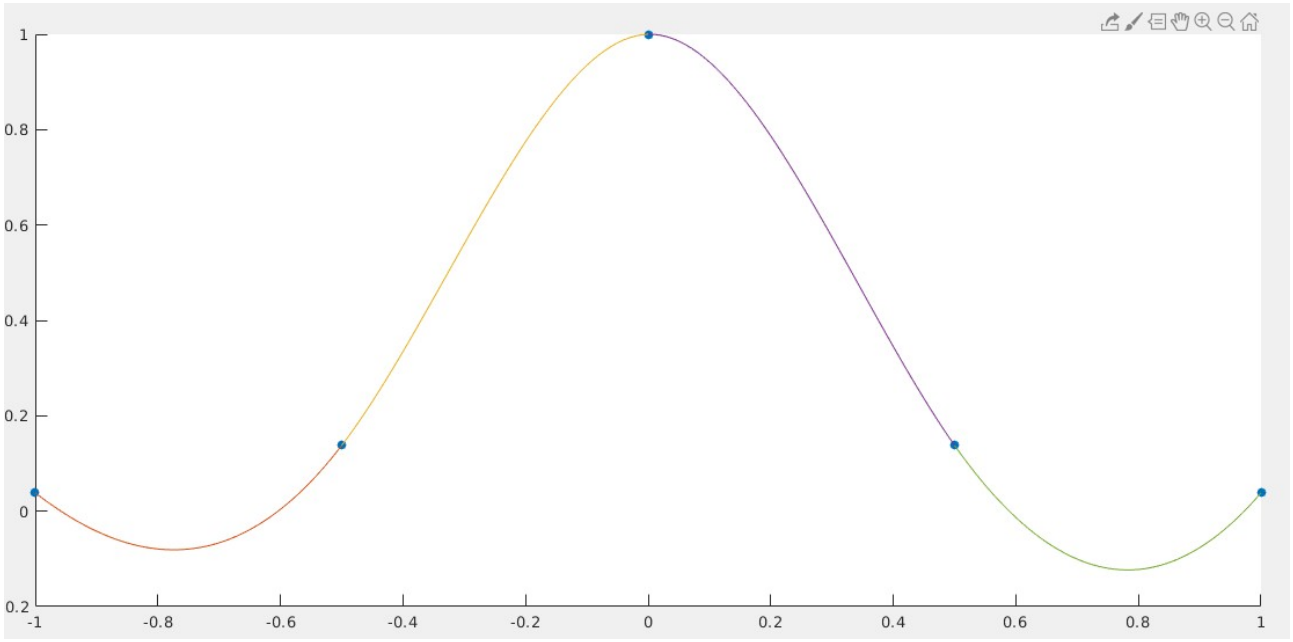
i	c3	c2	c1	c0
1	1.142886	5.254814	6.080971	2.007543
2	-6.917457	-6.835700	0.035714	1.000000
3	6.631743	-6.835700	0.035714	1.000000
4	0.285686	2.683386	-4.723829	1.793257

1st derivative and 2nd derivative at each node :

i	1st der	2nd der
0	-1.000000	3.652314
1	1.683321	7.080971
2	0.035714	-13.671400
3	-1.826179	6.223829
4	1.500000	7.080886

Interpolated values y* at give x* :

x*	y*
-0.800	-0.079311
-0.200	0.774769
0.200	0.786769
0.800	-0.122168



Tutorial 9

Question 1-a)

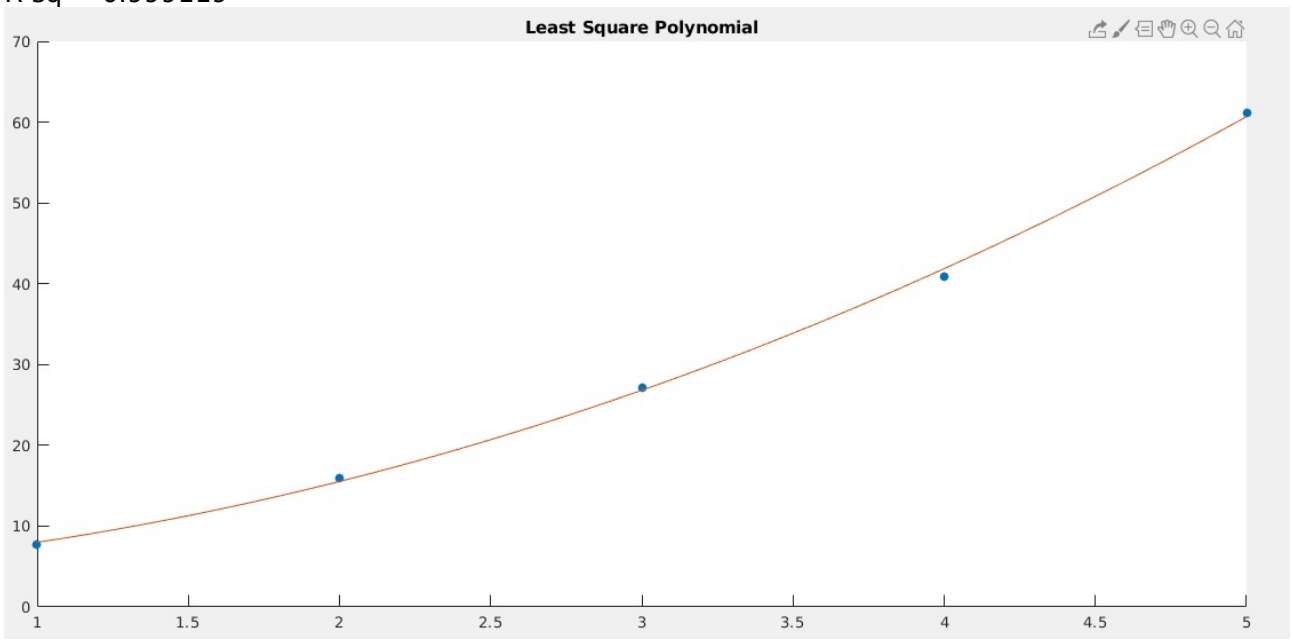
Output:

LeastSquare Interpolation Polynomial.....

Coefficients of the Polynomial :

1.878571 1.898571 4.220000

R-sq = 0.999119



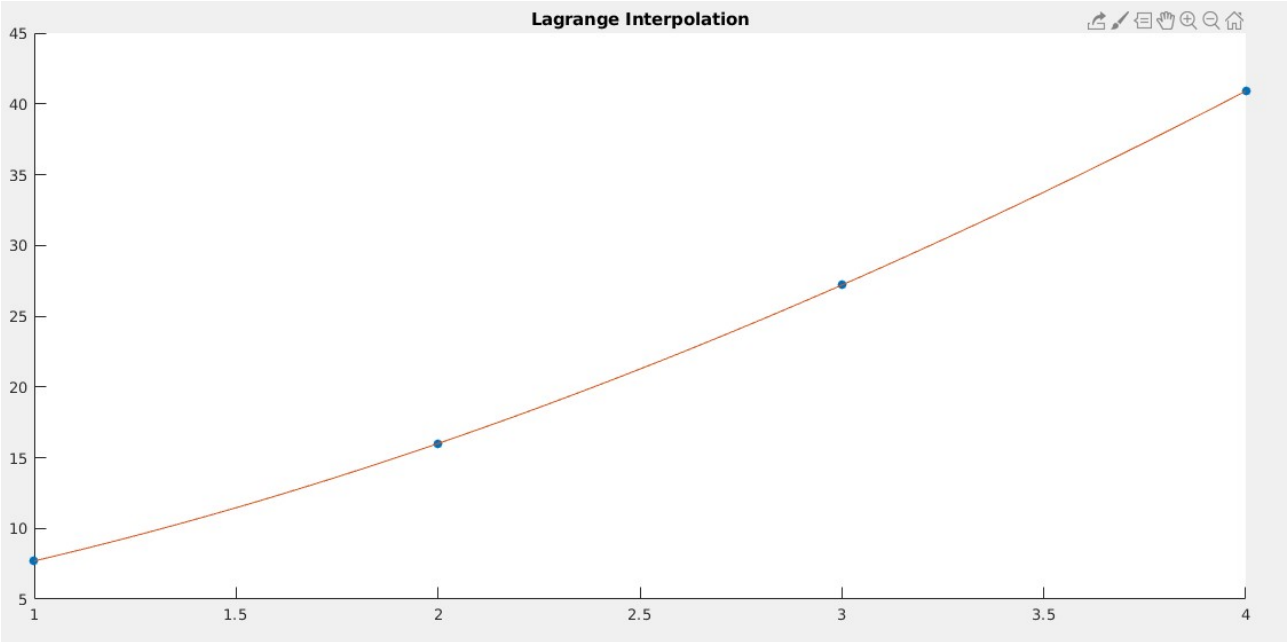
Question 1-b)

Output:

Lagrange Interpolation Polynomial.....

Coefficients of the Polynomial :

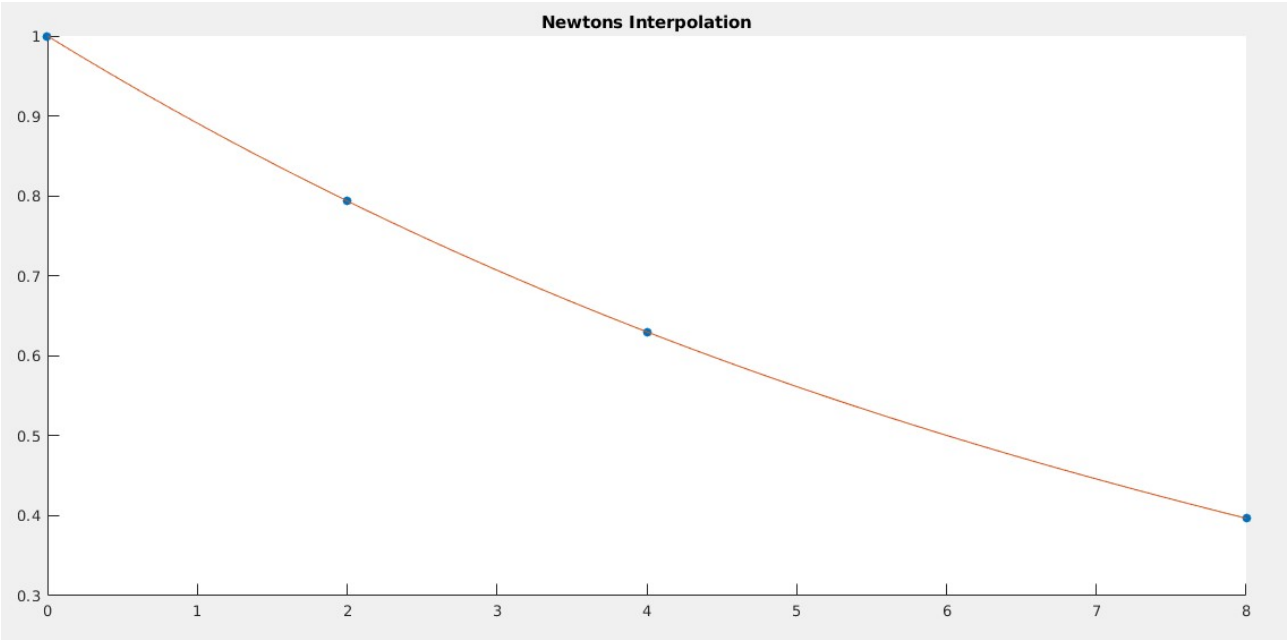
-0.066667 1.850000 3.216667 2.700000



Question-2)a
Output:
Newton Interpolation Polynomial.....

Coefficients of the Polynomial :

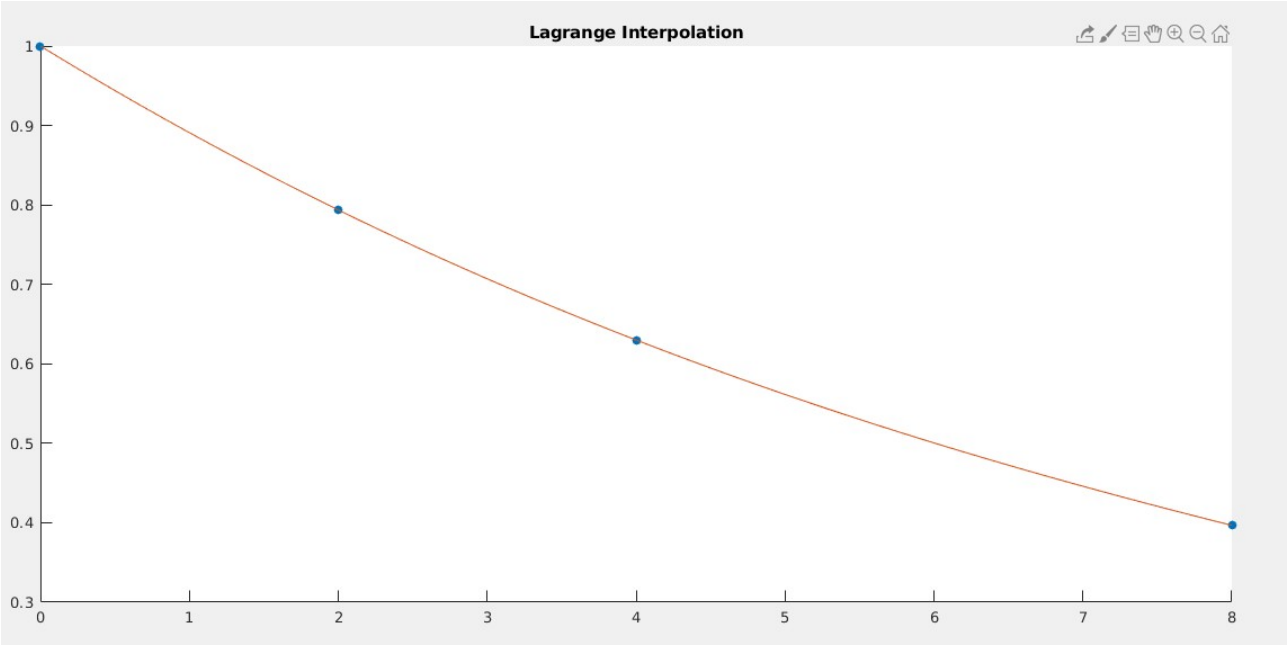
-0.000175 0.006375 -0.115200 1.000000



Question 2b
Output:
Lagrange Interpolation Polynomial.....

Coefficients of the Polynomial :

-0.000175 0.006375 -0.115200 1.000000



Question 2c

Output:

Coefficients of the equations in tabular form :

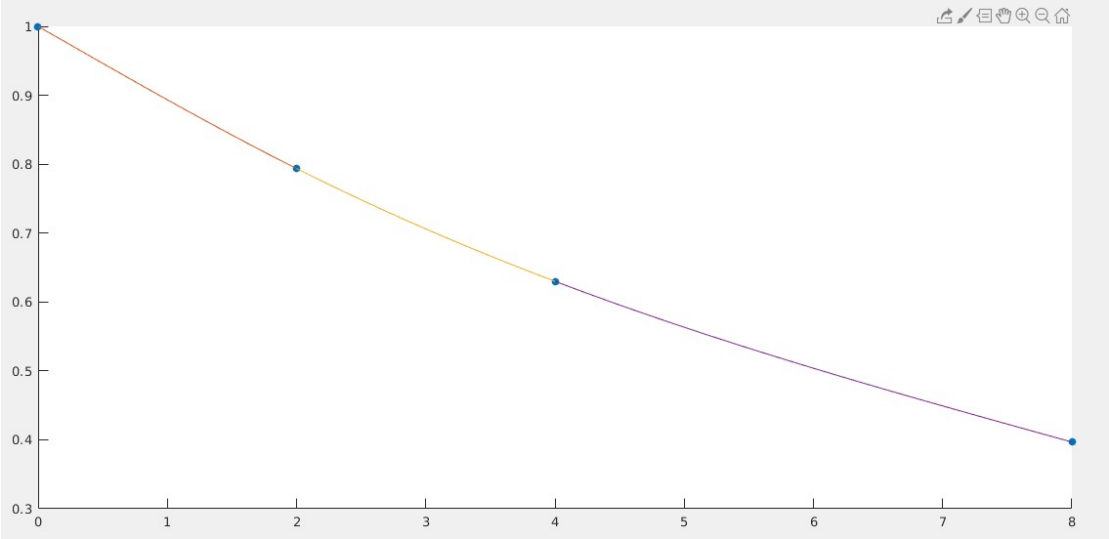
i	c3	c2	c1	c0
1	0.001133	0.000000	-0.107683	1.000000
2	-0.000341	0.008843	-0.125370	1.011791
3	-0.000396	0.009509	-0.128030	1.015339

1st derivative and 2nd derivative at each node :

i	1st der	2nd der
0	-0.107683	0.000000
1	-0.094085	0.013598
2	-0.070978	0.009509
3	-0.051961	0.000000

Interpolated values y* at give x* :

x*	y*
6.000	0.503891



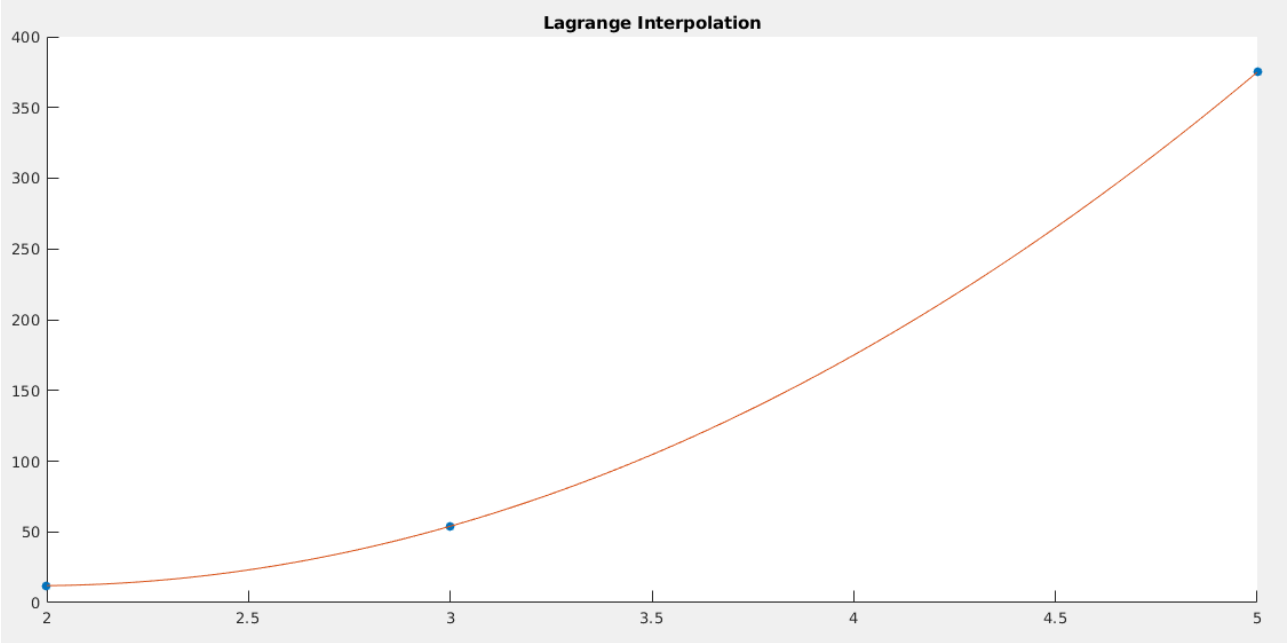
Question 3a

Output:

Lagrange Interpolation Polynomial.....

Coefficients of the Polynomial :

39.500000 -155.500000 165.000000



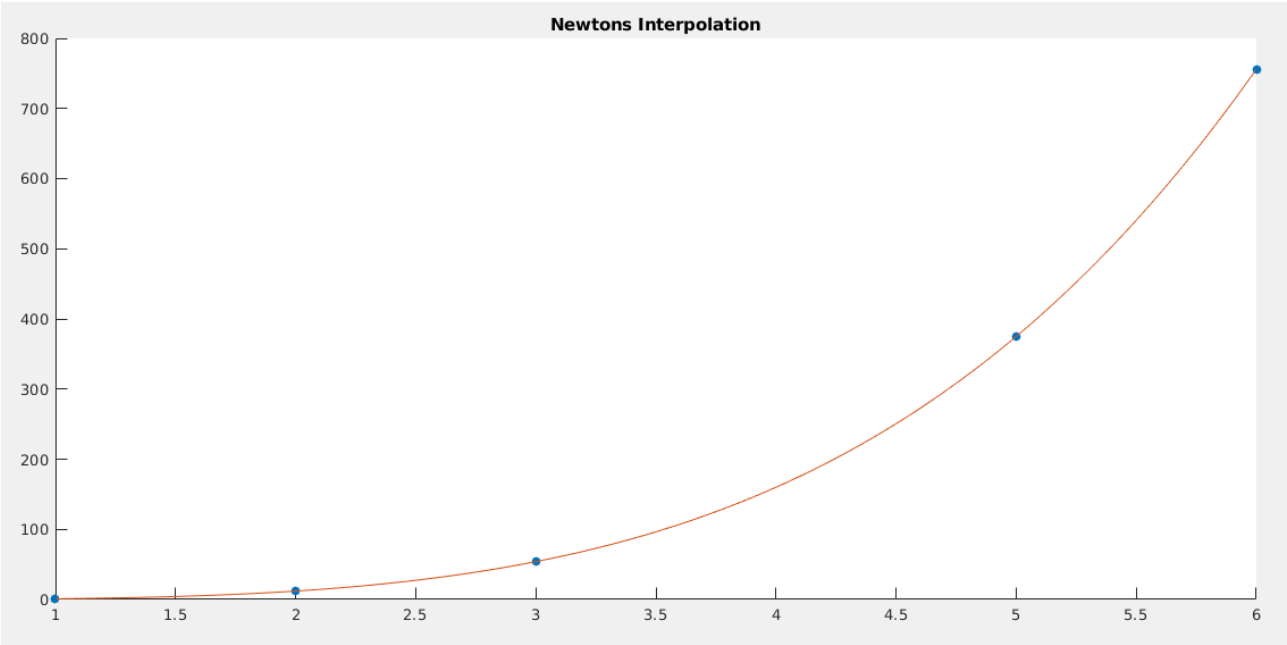
Question 3b

Output:

Newton Interpolation Polynomial.....

Coefficients of the Polynomial :

0.500000 0.500000 0.000000 0.000000 0.000000



Question 4a

Output:

Coefficients of the equations in tabular form :

i c3 c2 c1 c0

1 0.668886 0.000000 1.130179 1.000000
2 0.022771 0.969171 0.645593 1.080764
3 1.423229 -3.232200 4.846964 -0.319693
4 -2.114886 12.689314 -19.035307 11.621443

1st derivative and 2nd derivative at each node :

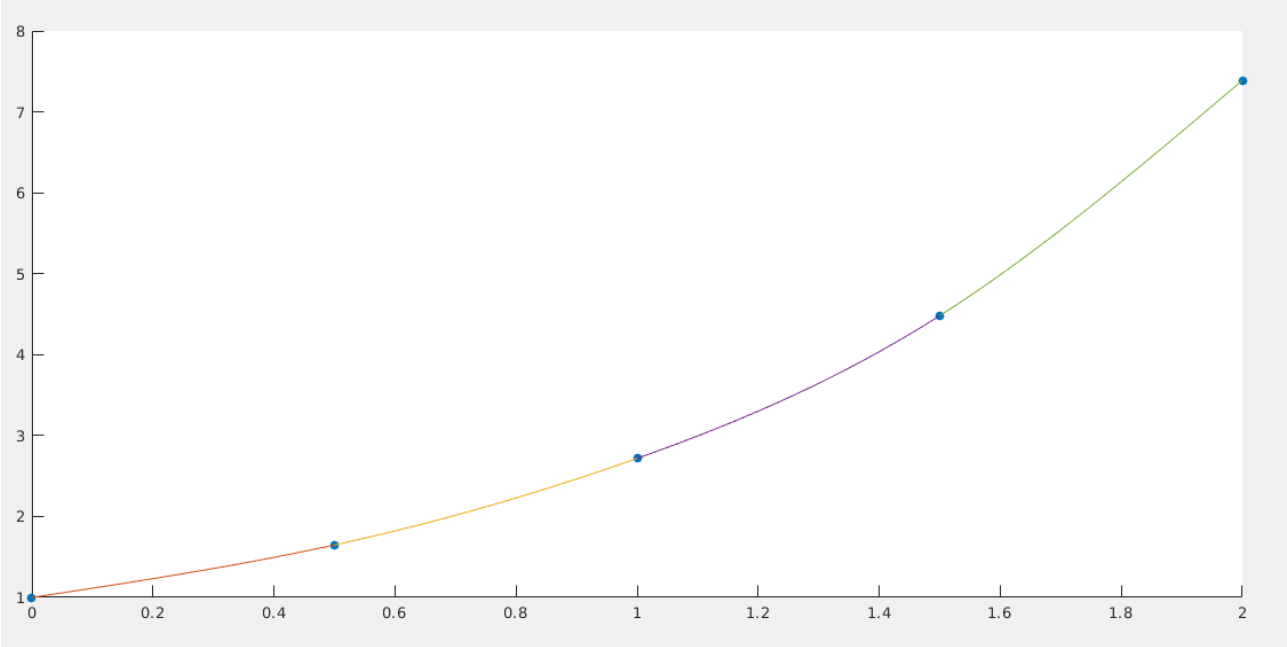
i 1st der 2nd der

0 1.130179 0.000000
1 1.631843 2.006657
2 2.652250 2.074971
3 4.757157 6.344657
4 6.343321 0.000000

Interpolated values y* at give x* :

x* y*

1.800 6.137255



Question 4b

Output:

Coefficients of the equations in tabular form :

i c3 c2 c1 c0

1 0.304800 0.384600 1.028900 1.000000
2 0.304800 0.384600 1.028900 1.000000
3 0.659200 -0.678600 2.092100 0.645600
4 0.659200 -0.678600 2.092100 0.645600

1st derivative and 2nd derivative at each node :

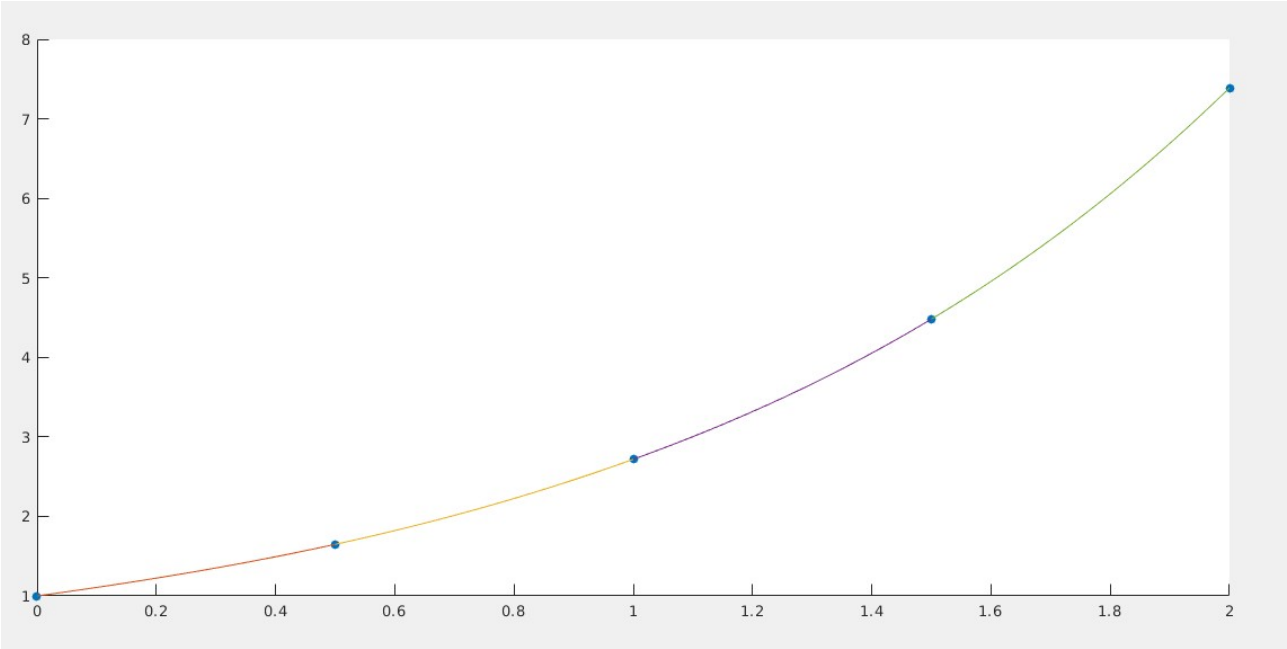
i 1st der 2nd der

0 1.028900 0.769200
1 1.642100 1.683600
2 2.712500 2.598000
3 4.505900 4.575600
4 7.288100 6.553200

Interpolated values y* at give x* :

x* y*

1.800 6.057170



Tutorial 8

Question 6

Output:

LeastSquare Interpolation Polynomial.....

Coefficients of the Polynomial :

0.000976 -0.011858 0.055337 -0.125882 0.209676

R-sq = 1.000000