LAB 05

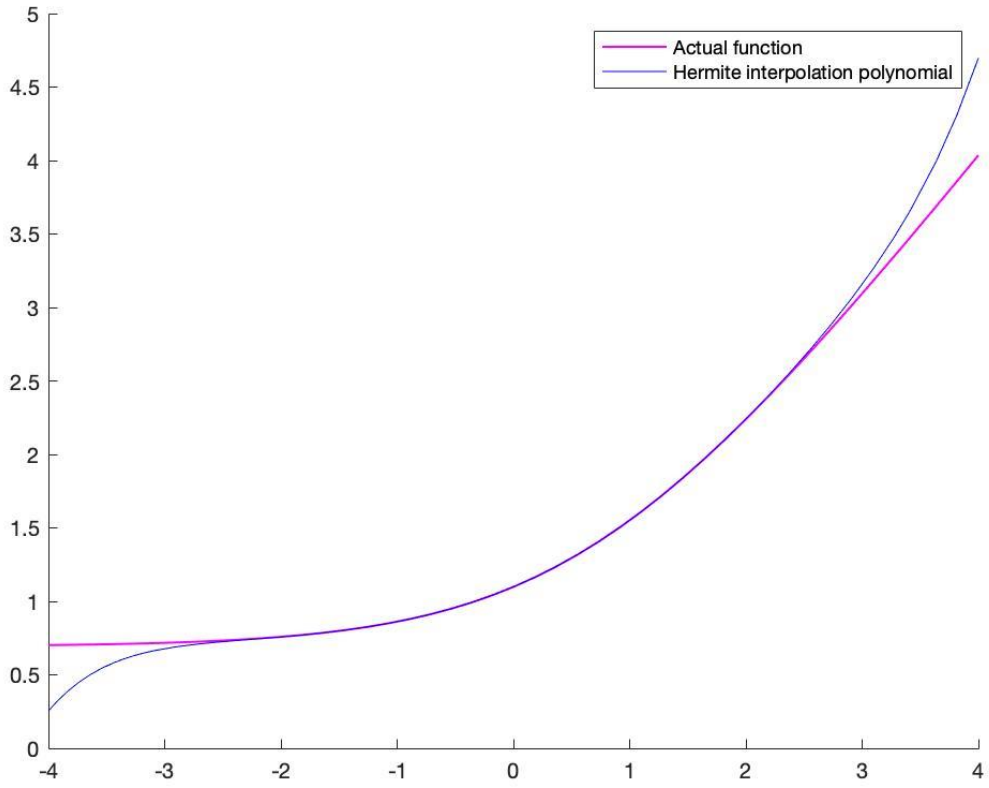
Q1)

Using Hermite interpolation at x = 0.250000 :

f(x) = 1.189070e+00

Actual value = 1.189070e+00

Absolute error = 1.699303e-07



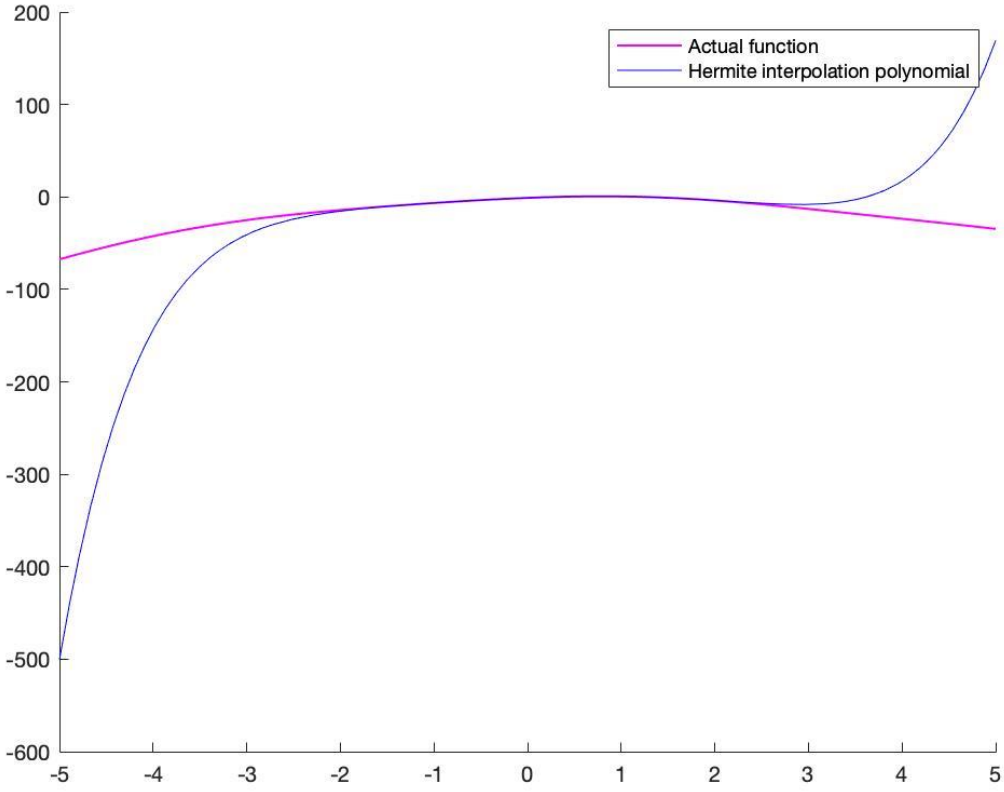
Q2)

Using Hermite interpolation at x = 0.201300 :

f(x) = -2.799081e-01

Actual value = -2.799081e-01

Absolute error = 4.428977e-09



Q3)

Hermite Interpolation :

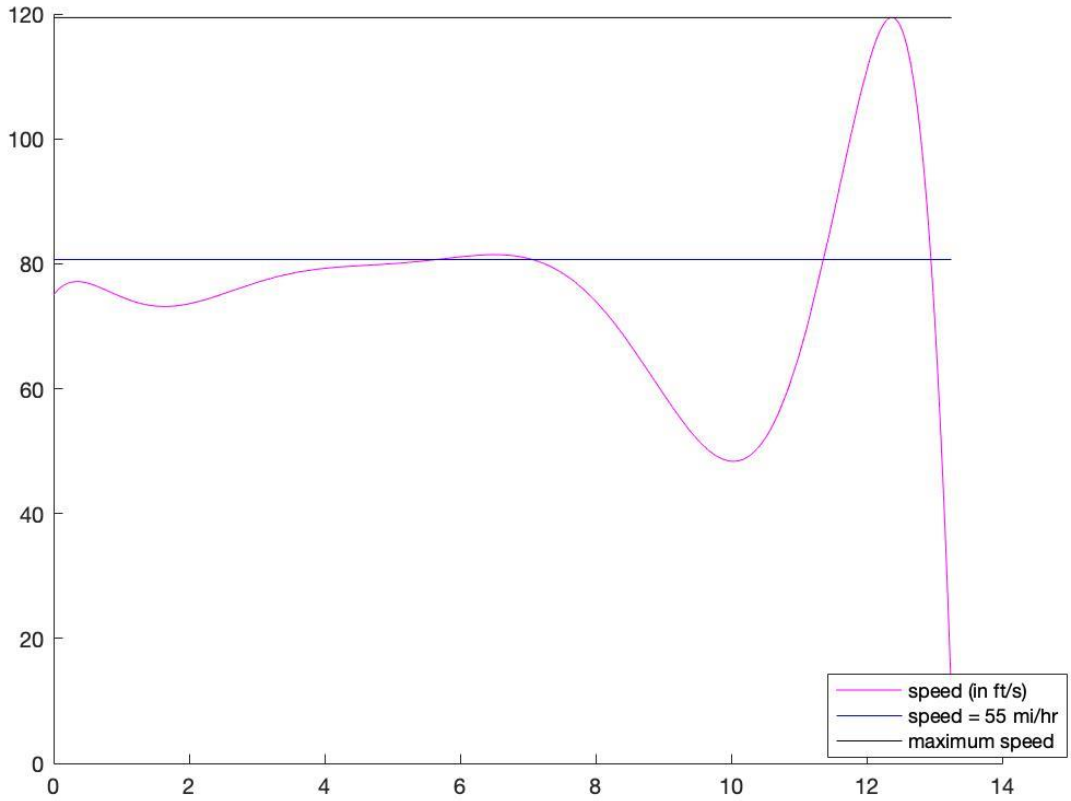
t = 10 seconds

Position of the car = 742.502839 feet

Speed of the car = 48.381736 feet/second

Speed limit of 55 mi/hr is exceeded at 5.65014695254625 seconds.

Predicted maximum speed of the car is 119.4173385360 ft/s.



Q4)

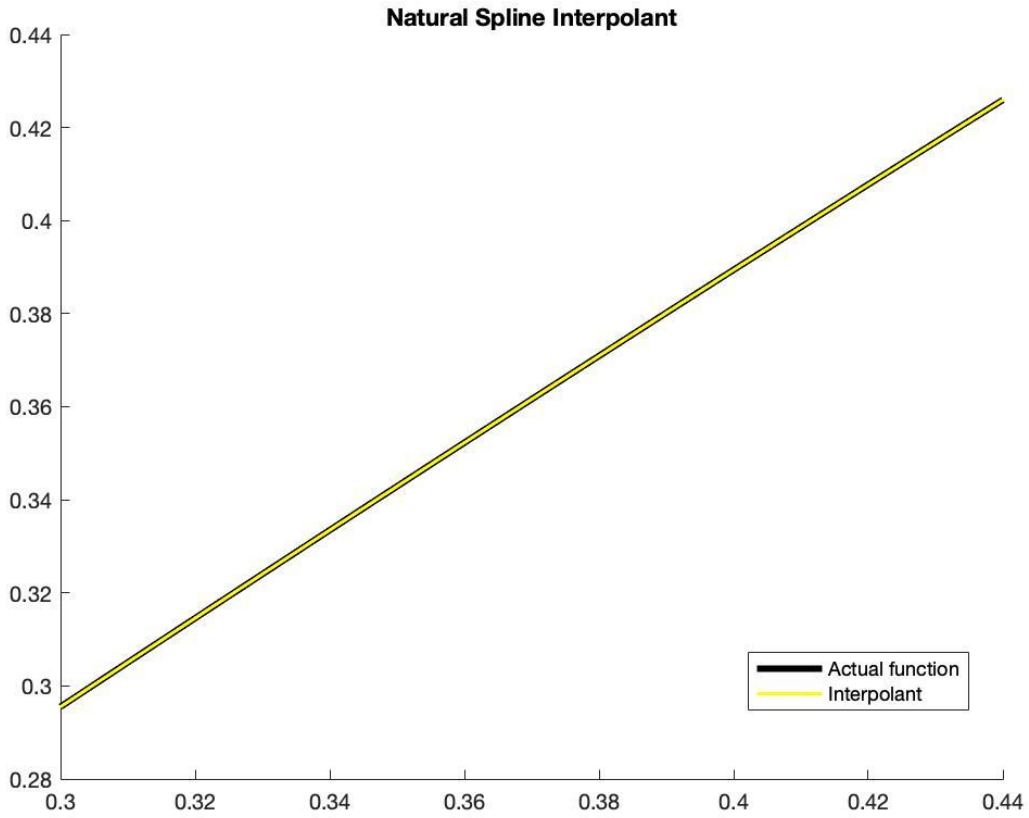
Natural Spline Interpolation :

Value of the interpolant at x = 0.3102 is :

0.3052

Absolute error :

0.0050



Q5)

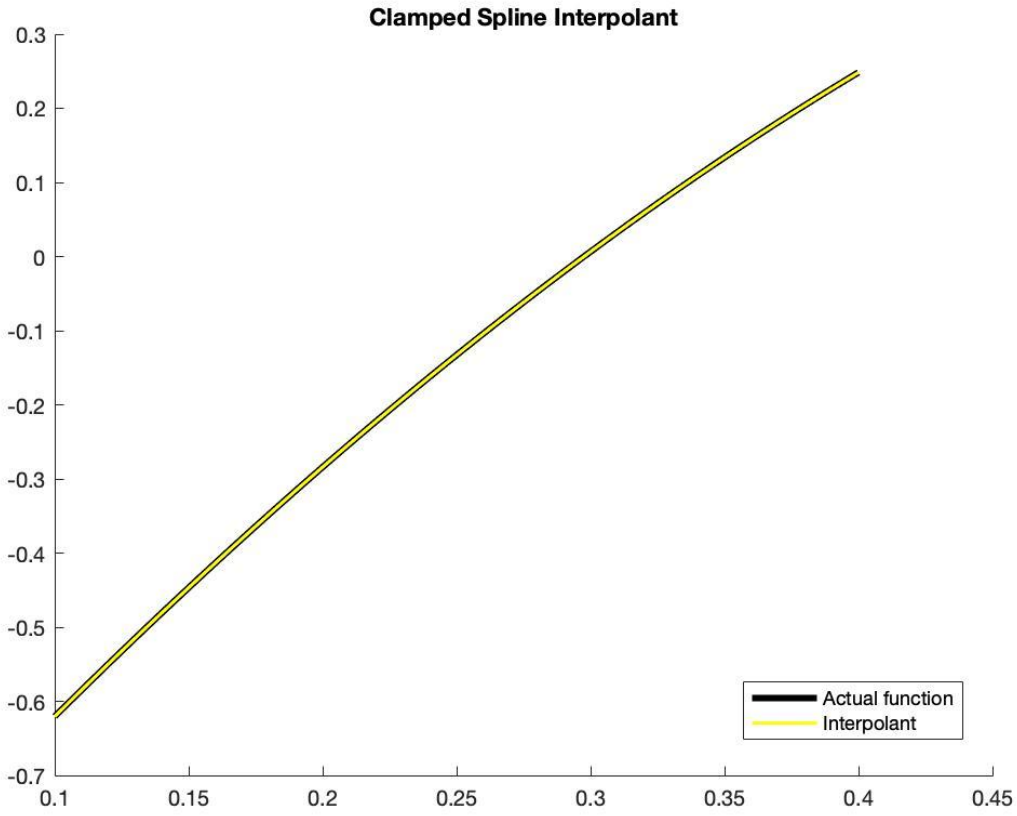
Clamped Spline Interpolation

Value of the interpolant at x = 0.2013 is :

-0.2799

Error of the interpolant at x = 0.2013 is :

4.7489e-10



Q6)

Using Natural Spline Interpolation :

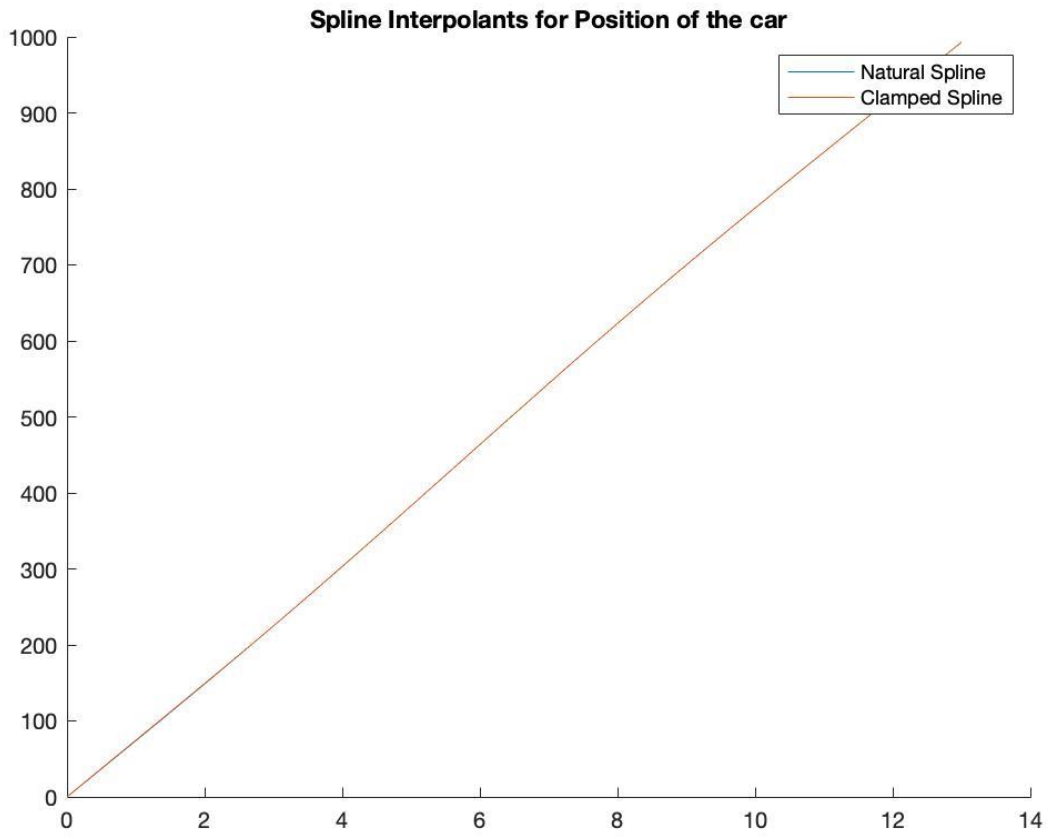
Position of the car when t = 10 seconds :774.863900 feets

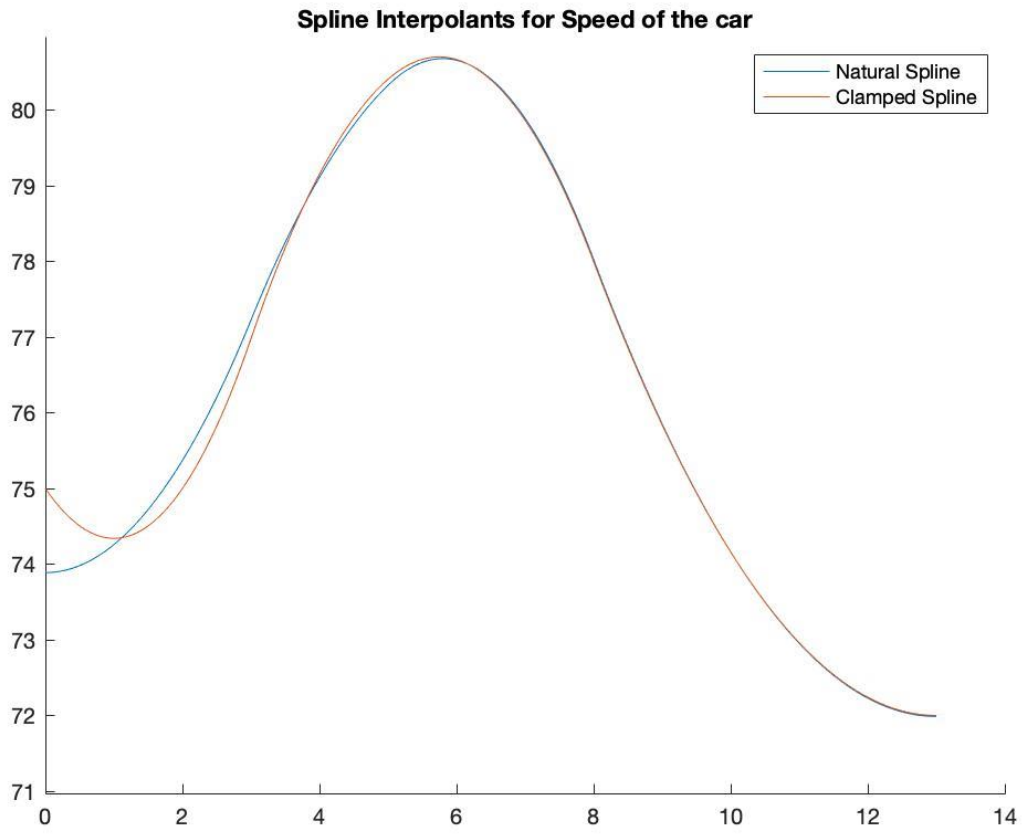
Speed of the car when t = 10 seconds :74.160996 feets/sec

Using Clamped Spline Interpolation :

Position of the car when t = 10 seconds :774.838407 feets

Speed of the car when t = 10 seconds :74.160265 feets/sec


Spline Interpolants for Position of the car
Natural Spline
Clamped Spline
1000
900
800
700
600
500
400
300
200
100
0
0
2
4
6
8
10
12
14


Spline Interpolants for Speed of the car
Natural Spline
Clamped Spline
80
79
78
77
76
75
74
73
72
71
0
2
4
6
8
10
12
14