

Lab 5

Problem 1: Value of $f(0.25)$ is 1.18907.
The absolute error is $1.699303e-07$.

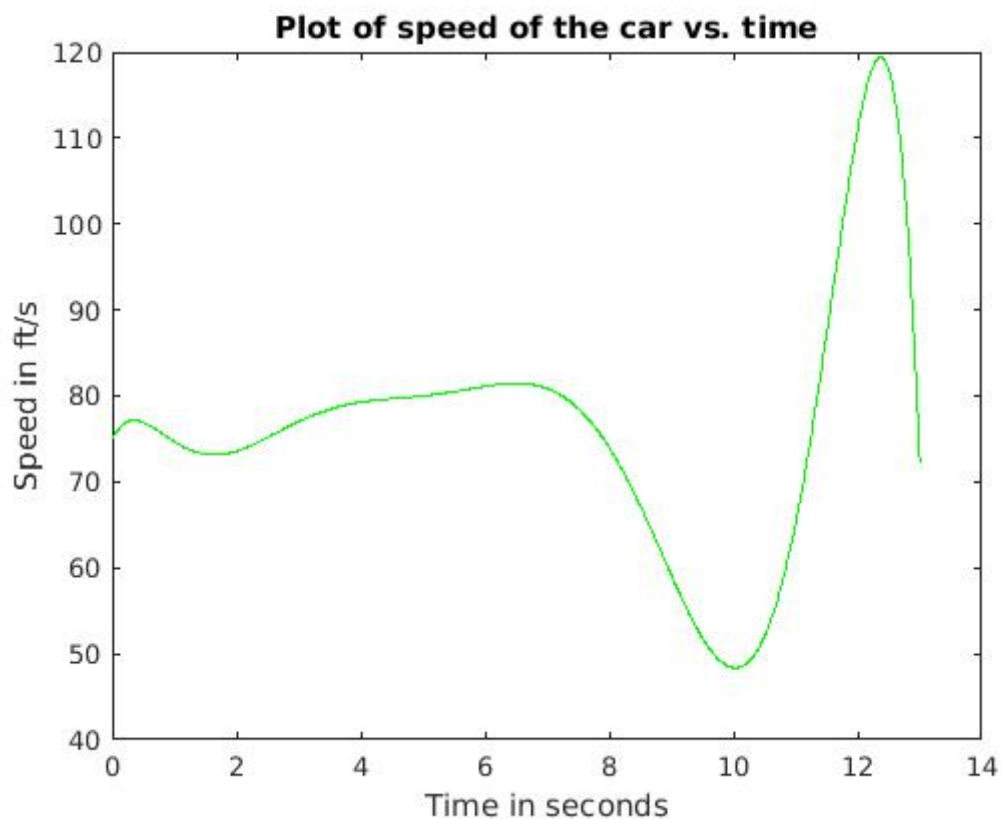
Problem 2: Value of $f(0.2013)$ is -0.27991.
The absolute error is $4.428977e-09$.

Problem 3:

a)

- By Hermite interpolation , position of the car at $t = 10$ seconds is 742.50284 feet.
- By Hermite interpolation , speed of the car at $t = 10$ seconds is 48.38174 feet/sec.

b)



Using the derivative of Hermite polynomial , first time the car exceeds 55mi/h is 5.65 s.

c) Predicted maximum speed of the car is 119.417 ft/s.

Problem 4: By the Natural Cubic Spline interpolant,

- Value of $f(0.3102)$ is 0.30524.
- The absolute error is $5.347792e-06$.

Problem 5: By Clamped Cubic Spline interpolant,

- Value of $f(0.2013)$ is -0.27991.
- The absolute error is $4.748873e-10$.

Problem 6:

a) Using natural cubic spline interpolant:

- By natural spline interpolation , position of the car at $t = 10$ seconds is 774.86390 feet.
- By natural spine interpolation , speed of the car at $t = 10$ seconds is 74.16100 feet/sec.

b) Using clamped spline interpolant:

- By clamped spine interpolation , position of the car at $t = 10$ seconds is 774.83841 feet.
- By clamped spine interpolation , speed of the car at $t = 10$ seconds is 74.16027 feet/sec.