

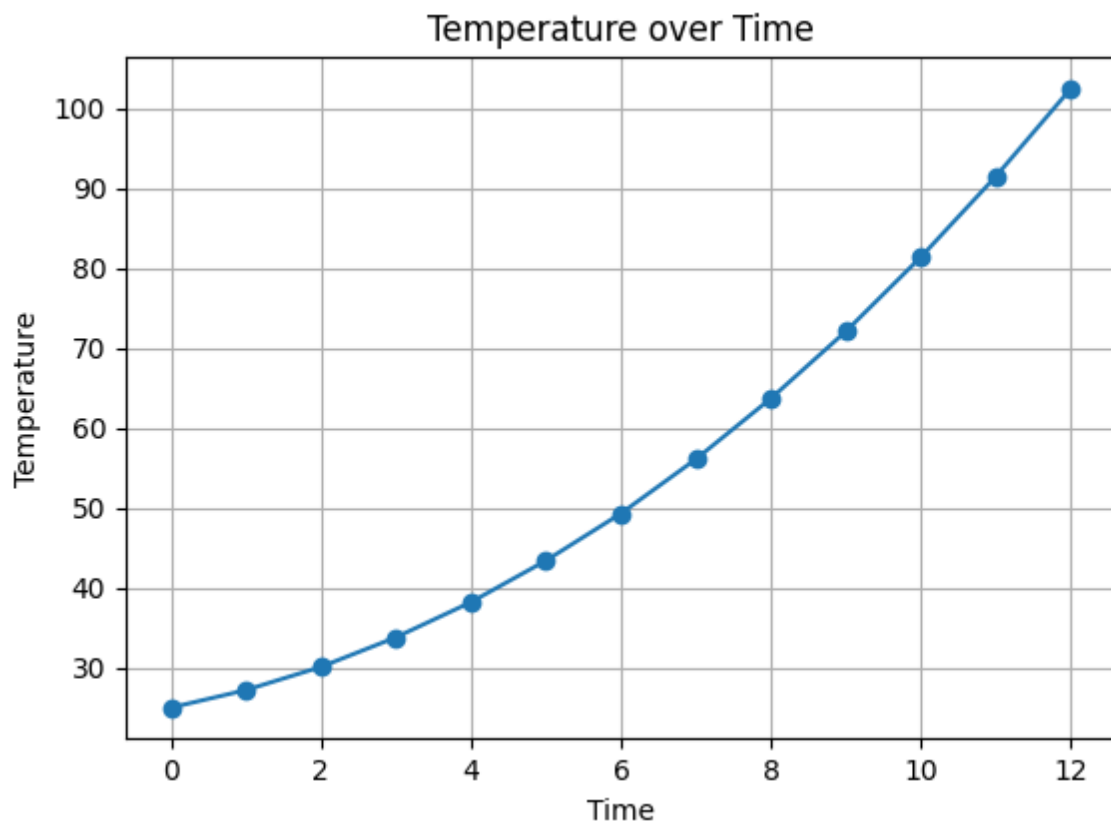
Lab-12

sol1:

- 1.) speed at $t=1.2$ using forward difference with $h=0.4$: -142.5
- 2.) speed at $t=1.2$ using forward difference with $h=0.2$: -145
- 3.) speed at $t=1.2$ using richard_extrapolation : -147.5
- 4.) absolute error of forward_difference with $h=0.4$ wrt extrapolation result is: 5
absolute error of forward_difference with $h=0.2$ wrt extrapolation result is: 2.5
- 5.)sources of error:
 1. air resistance
 2. sensor noise
 3. error in recording time intervals
- 6.) altitude at 1.4 is :11793.5
absolute error in calculating altitude at $t=1.4$ is: 34.5

sol2:

- 1.) Temperature at $t=0$ using forward difference with $h=1$: 2.199999999999993
- 2.) Temperature at $t=0$ using 3-point forward difference with $h=1$: 1.8499999999999979
- 3.) 3 point is better as it's order of accuracy is high and using more data points
- 4.) based on data and graph the temperature rise is exponential as plotting the logarithm value getting a straight line.
- 5.) if only first 4 values are available we can use 4point- central difference , backward difference



sol3:

Truck's speed at t=50 using forward difference: 0.4799999999999997

Truck's speed at t=50 using 3-point forward difference: 0.40999999999999994

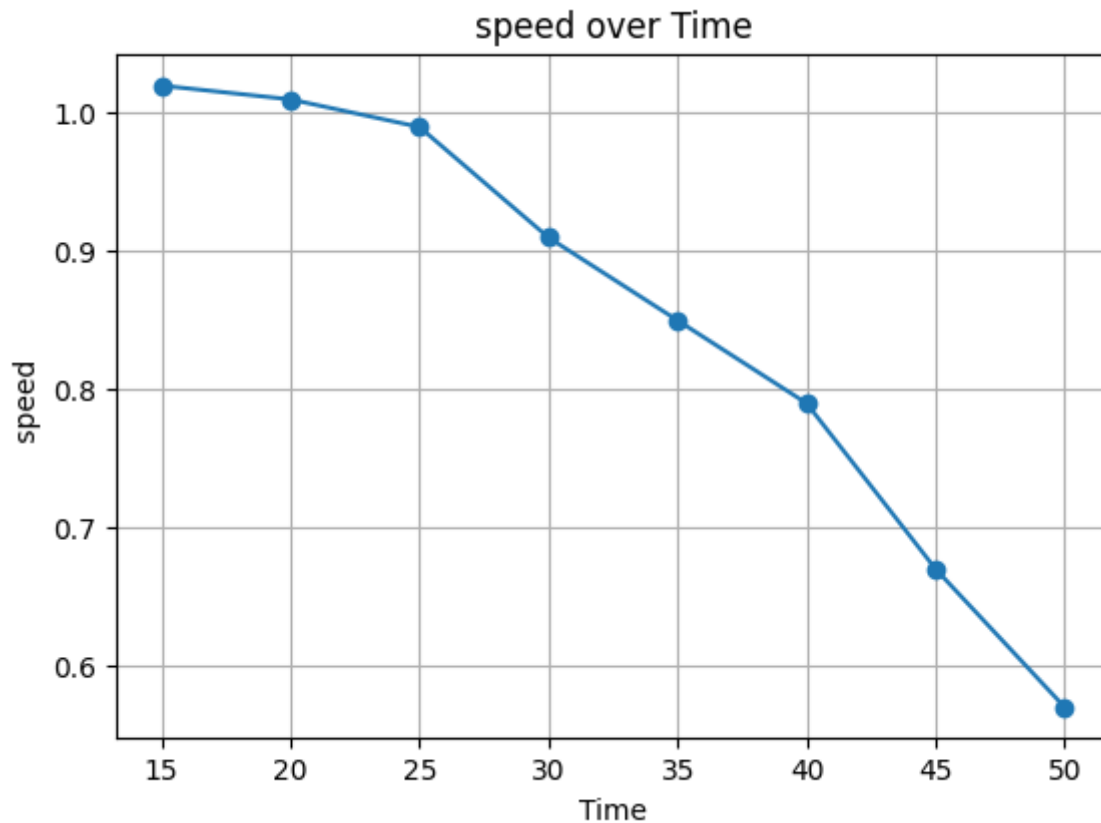
stopping distance is 2.62656249999999675

Truck's speed at t=20 0.9899999999999997

Truck's speed at t=30 0.85000000000000011

Truck's speed at t=40 0.67000000000000006

#as speed is decreasing so truck is slowing



sol4:

rate of pressure drop at altitude=600 using central difference : -0.09

rate of pressure drop at altitude=600 using 3-point central difference : -0.09

#4.3)based on data pressure is decreasing

#4.4)yes there is exponential decrease in the pressure

#4.5)bcouz of higher order of accuracy

#4.6)a.)incorrect weather prediction

#b.) risk of ballon burst

Altitude and pressure

