Programming Assignment-2

1) Curvature Flow Equation:

Code was implemented Based on the Equation:

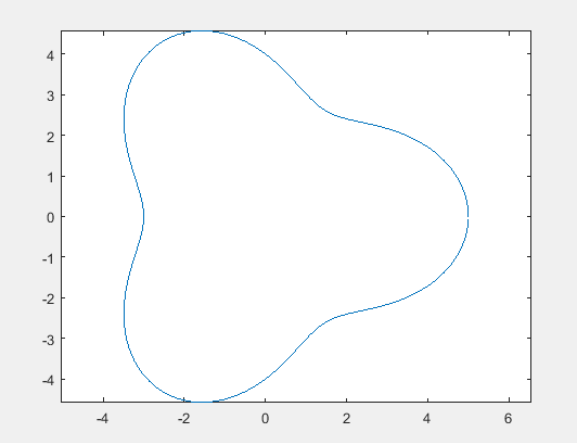
$$\partial C(s,t)/\partial t = \kappa N$$

For discretizing the curvature Central difference euler's method was used and for discretising Curve shape w.r.t Forward difference euler's method was used.

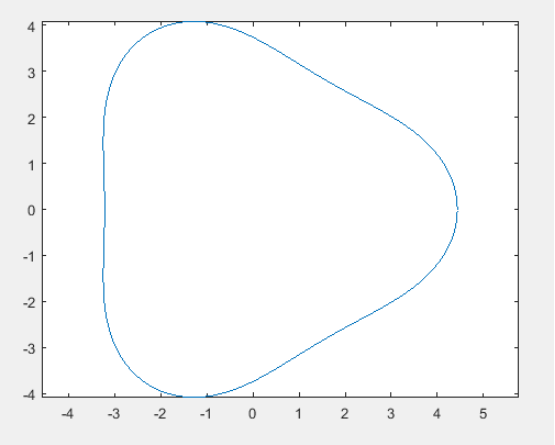
The code was tested on 3 different with different time steps. Below are some results:

Curve 1:

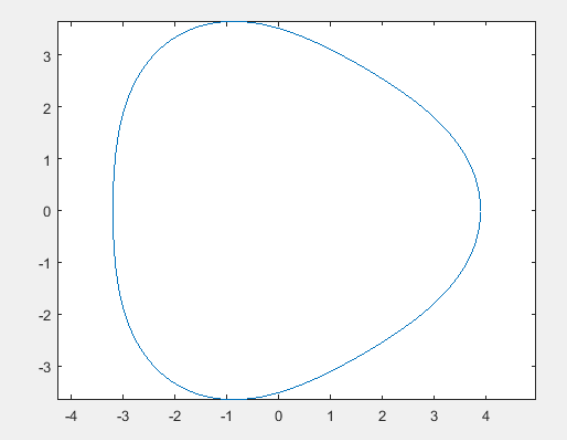
T=0



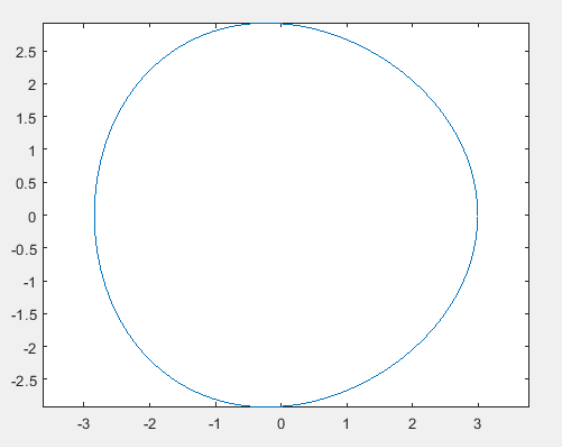
T=1



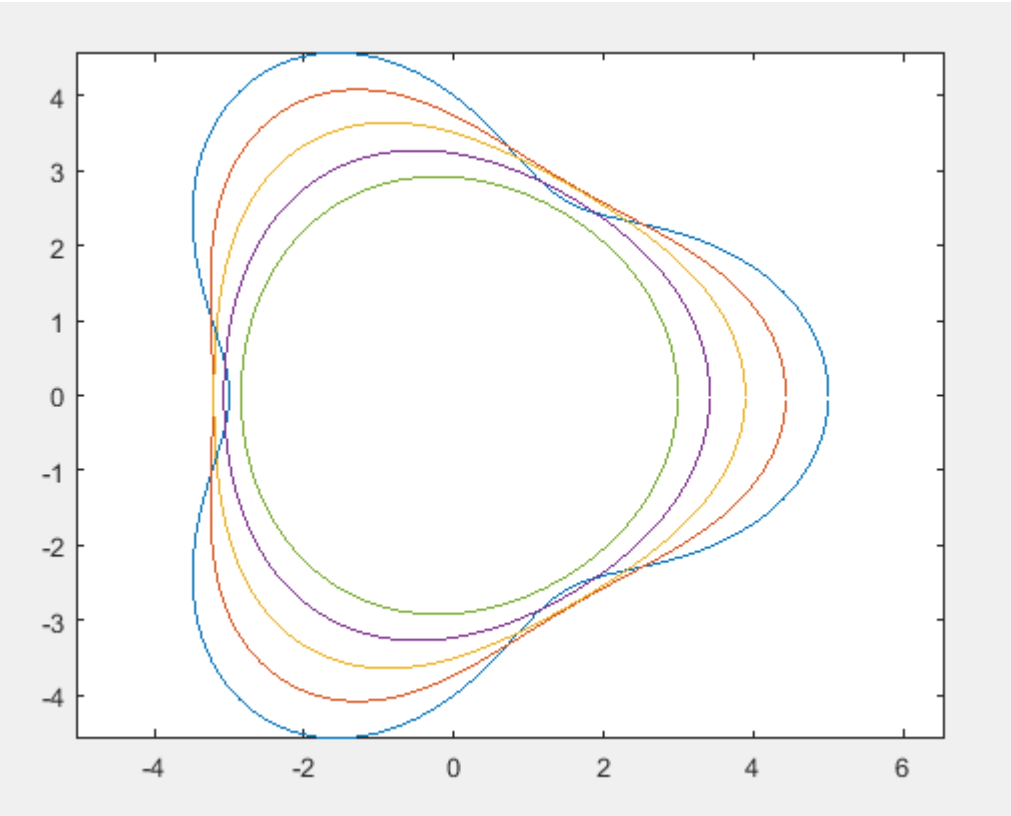
T=2



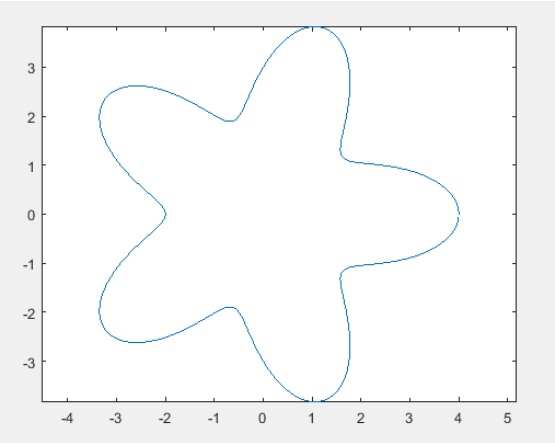
T=4

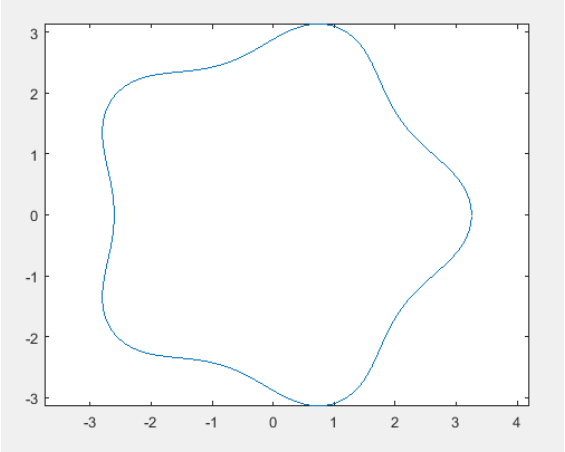


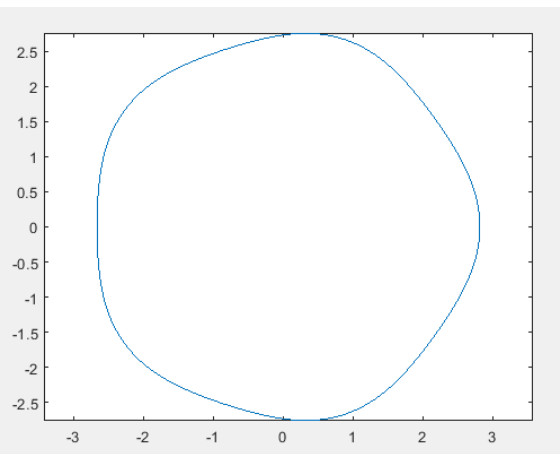
Curve Evolution:

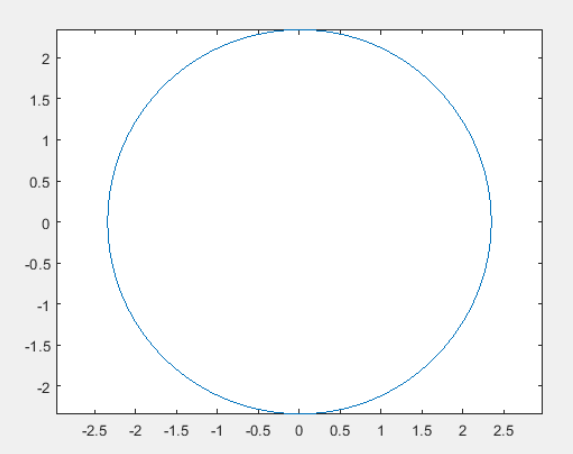


Curve 2:

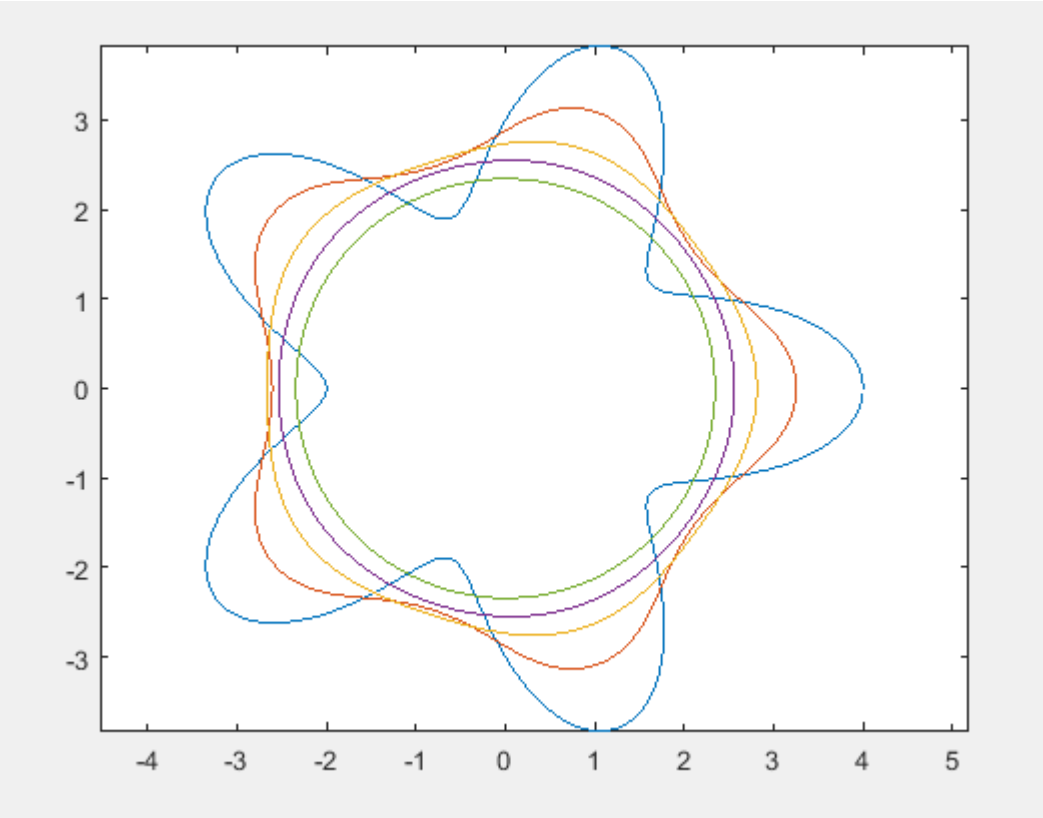




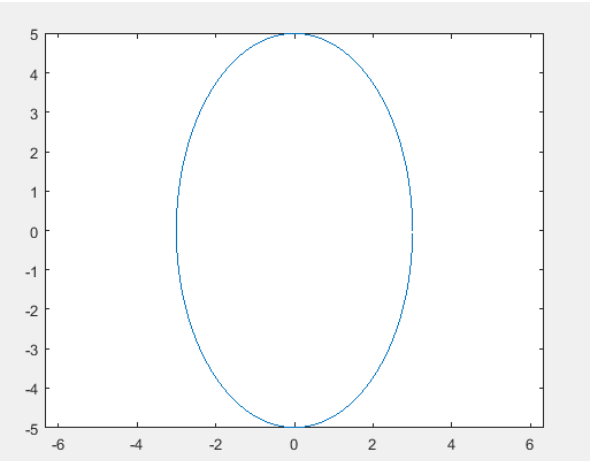


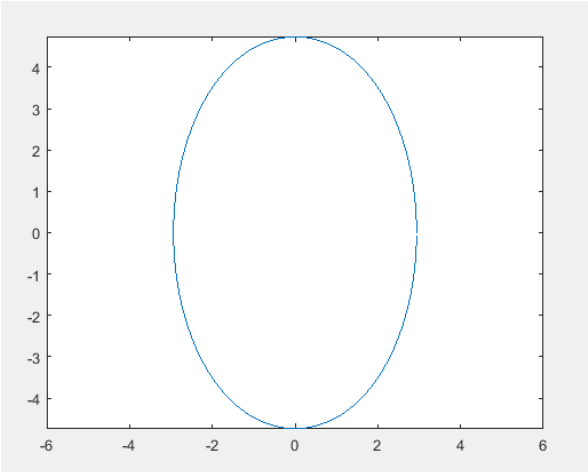


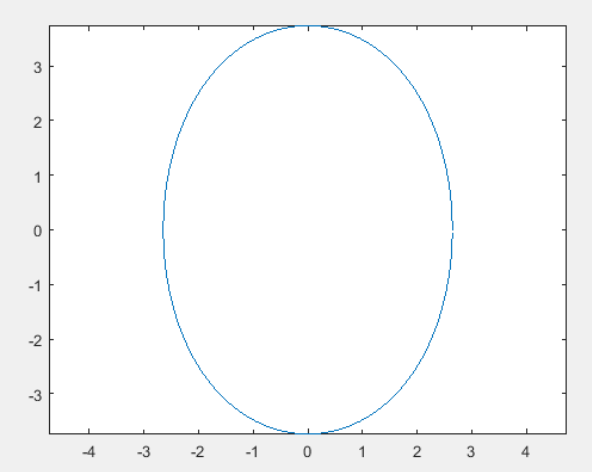
Curve Evolution:

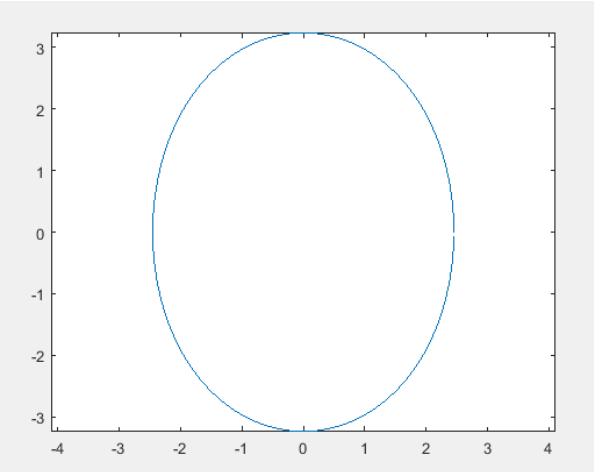


Curve 3:

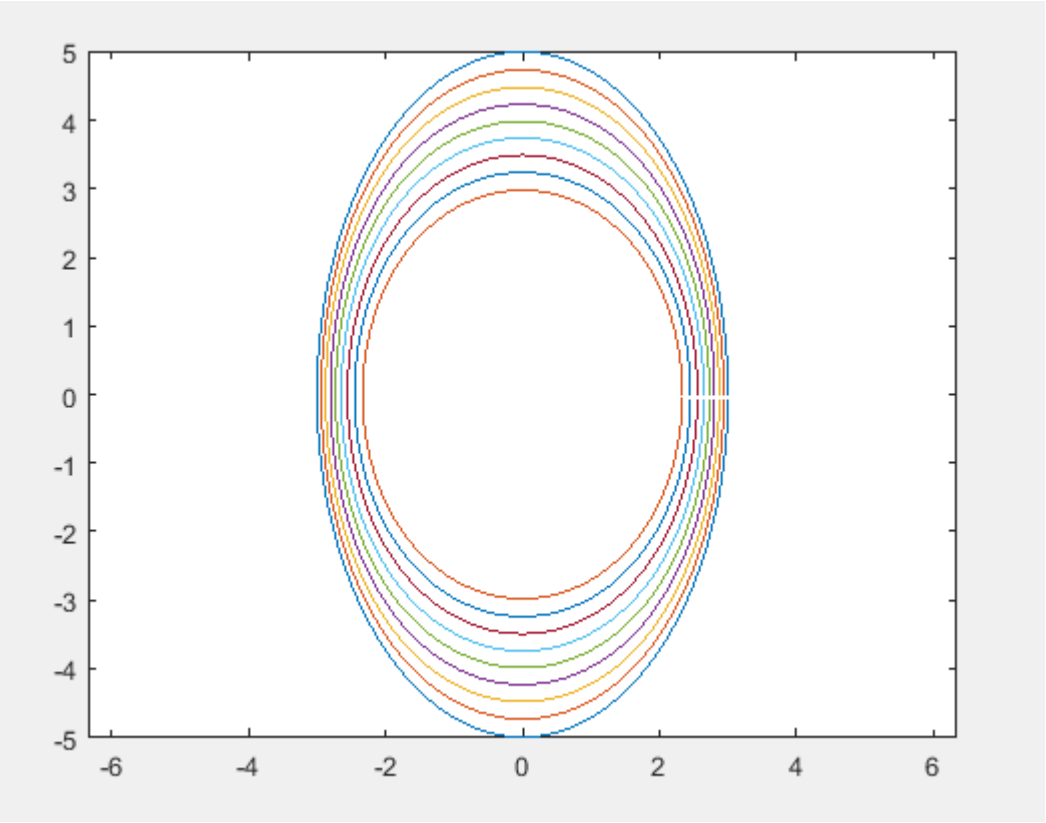








Curve Evolution:



Time Steps used was : **1600**, **10,000**, **40,000**, **80,000**

Results shown are for Time step **40,000**.

Number of Sample points: 256,512,1024,2048

Observations:

1) All the closed curves tend to become a **circle** as t->inf in it's stable state.
2) As we increase the sample point size we have to increase the time steps to get error free results.
3) If sample size is ,say 2000, and time step of 1600 the error rate will be very high as some of the derivatives will shoot up.

How to Run:

The file Main.m is the entry point. We can run the script by:

1) Main :
   It will import all the functions

```
>> Main

ans =

    'Done importing functions to workspace'
```