The goal of this project is to make and deploy interacts for the mechanisms to plot plane curves defined by finite Fourier series, as explored in Project Two. You may use the posted solution to Project Two.

1. The Hypocycloid

The parametric form of the coordinates \((x(t), y(t))\) of the hypocycloid
\[
x(t) = 3 \cos(-2t) + 2 \cos(3t), \quad y(t) = 3 \sin(-2t) + 2 \sin(3t),
\]
corresponds a single coupled serial chain mechanism defined by a crank, two links, one joint, and a twisted belt connecting the crank with the joint, shown in Figure 1.

![Figure 1: An interact for the serial chain mechanism to draw the hypocycloid.](image)

The slider drives the crank of the mechanism. The range of the slider goes from 0 to \(2\pi\) in increments of \(\pi/20\). The initial position of the angle for the crank, as shown in Figure 1, is at \(2\pi - \pi/10\).
Assignment One. Make an interact to simulate the single coupled serial chain mechanism to draw the hypocycloid. Deploy the interact on your web site.

2. The Trifolium

The coordinates of the trifolium can be defined in parametric form as

\[ x(t) = \cos(-2t + \pi) + \cos(4t + \pi), \quad y(t) = \sin(-2t + \pi) + \sin(4t + \pi). \]

Assignment Two. Make an interact to simulate the single coupled serial chain mechanism to draw the trifolium, as shown in Figure 2. Deploy the interact on your web site.

![Interact for the serial chain mechanism to draw the trifolium.](image)

Figure 2: An interact for the serial chain mechanism to draw the trifolium.

The slider drives the crank of the mechanism. The range of the slider goes from 0 to 2\(\pi\) in increments of \(\pi/20\). The initial position of the angle for the crank, as shown in Figure 2, is at \(2\pi - \pi/10\).
2. The deadline is Wednesday 28 November 2018, at 1PM.

The solutions to the project will be collected at the beginning of our class meeting on Wednesday 28 November at 1PM. If you cannot come to class that day, then you must arrange to hand in your solution before the deadline. Otherwise, your solution will be discounted with 10 points if it is turned in on the same day before 5PM, and will no longer be accepted afterwards.

The solution consists of two parts:

1. One single notebook, organized properly to the two assignments. All cells in the notebook should run from top to bottom as a program without errors. Write proper documentation for the calculations. Email your notebook as an attachment to janv@uic.edu with MCS 320 Project 2.5 as the title of the email. If you use a non-UIC email account, add your name to the title of the email.

2. The URL of a publicly accessible web page where your interact is deployed. The project will be graded on 40 points and 20 of the 40 points will go towards the deployment of the interact.

This project must be solved individually. Under no circumstances is it allowed to copy or to collaborate. Regardless of who copied from whom, all caught in the act of plagiarism will be penalized.

If you have questions, comments, or difficulties, feel free to come to my office for help.

References