Hongliang’s Python Assignment Project Summary

To run the program, you would need the data (“data.txt”) to be in the same directory. The project simply includes 4 page views or screens.

Screen 1: Introduction Screen

A picture containing text

Description automatically generated

This screen is used to gather user input. He/she will be asked to choose either user input or data input (from “data.txt” file).

If data input is selected, user will be prompted which data will be used for the run. 10 data sets have been provided in dictionary format. If user wishes to add more data, the most convenient method would be to copy and paste one of the lines and amend the data to fit their desired cam profile.

If user input is selected, user will be prompted all necessary inputs for the cam profile to be defined.

Screen 2: Preview Screen

Diagram, schematic

Description automatically generatedChart, diagram

Description automatically generated



This screen shows all required data including cam displacement vs angle curve and the cam profile. Here, the cam profile is detailed with the follower and its features. On this screen there are a few buttons. The “Back” button on the top left, when pressed, will take the user back to the Introduction Screen. The “Graph” and “Cam” buttons will take the user to the Graph and Animation Screens respectively, which will be covered in the later part of this document. The button mechanism works by retrieving the mouse click coordinates and checking whether they are within required area to perform the operation. The “End” button quits the program. The picture on the left shows the profile for the 1st row of the data file, and the picture on the right shows the profile for the 2nd row.

Screen 3: Graph Screen

Chart, line chart

Description automatically generatedChart, line chart

Description automatically generated

This screen features an enlarged view of the cam displacement vs angle curve and the cam profile. An “angle” button will allow the user to change the units of the x-axis from degrees to radians and vice versa. This feature is also available on the Preview Screen.

Screen 4: Animation Screen

Shape

Description automatically generated with medium confidence

This screen features an animation of the cam rotating with the follower resting on top. This is an optional feature of the program. The animation will play for 5 revolutions.

Key Strengths:

Use of functions for testing: the watch\_turtle() function is used whenever a bug occurs. When the programmer needs to troubleshoot the program, he can insert the code and watch the turtles move in the slowest speed so that he is able to identify and fix the bug.

User-friendly: all interaction with the program is displayed on the turtle screen not the python shell. Another aspect is that user navigates through the different views using mouse clicks.

Data is very clear: when viewing data, user can enlarge each view to focus on different features of the cam. If they are interested in the graph of the cam, they can enlarge the view and take a picture of their results.

Limitations:

Time constraint: since this is a project submission with a deadline, not all the features that I want to implement could be made. Features include a query prompt on the Graph Screen where user input the angle and the program would display the cam displacement.