# *Introduction to Programming (ITAS 185)*

# *Lab 8 – Python Libraries*

Date due: **Friday, November 24, by 14:00**

**Learning Objectives**

Upon successful completion of this lab exercise, the student will be able to:

* Install Python libraries
* Use Python turtle GUI library
* Use OpenAI library

**To be handed in:**

1. The ***username185L08*** folder should be zipped and uploaded to the ITAS Portal. ***Username*** isyour logon username (mine would be allan.mcdonald).

**To start:**

1. Create a folder called ***username*185L08** that you will use for ALL the files in the lab.
2. Open this **FOLDER** in VS Code. Make sure you open the folder and not just the files.

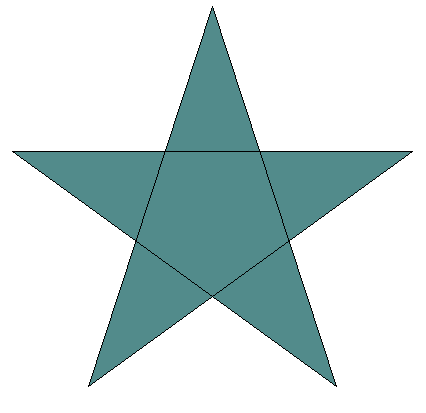
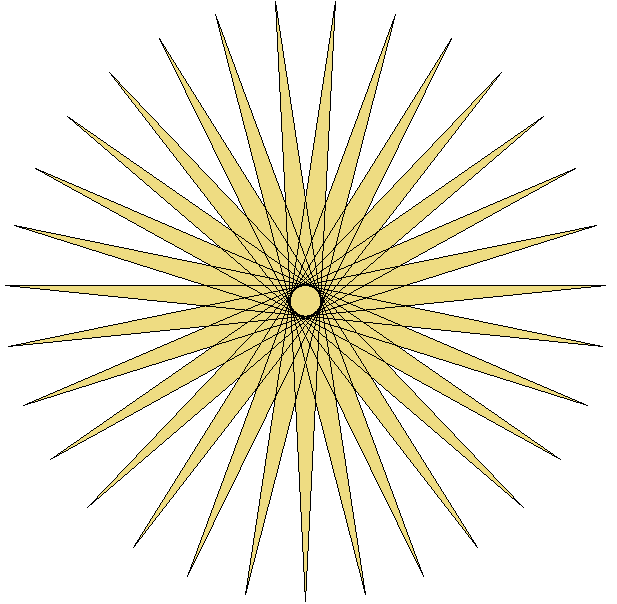
To Do

**Part A – Turtles, turtles, ya, ya, ya**

1. Create a Python file called parta\_house.py.
2. Import the turtle module and set it up to be 800x800 pixels and show the canvas.
3. Your task is to draw a simple house using the turtle functions. Set the position to -200, -150 so that the house is roughly centred on the screen. The house must have at least a box-like shape, a roof, a window and a door. At least part of the house has to be filled with a colour. Choose one other item to add to your house: a chimney, birds flying overhead, a tree outside, or some other idea.
4. You must use functions to draw your shapes such as a triangle (the roof) and square (the house and maybe a window) and a rectangle (the door). You should pass these functions the size and the colour
5. Remember to use exitonclick() at the end of the code to make sure your window stays open until you click on the canvas.

**Part B – Turtles, turtles, ra, ra, ra**

1. Create a Python file called partb\_stars.py
2. Import the turtle module and set it up to be 800x800 pixels and show the canvas.
3. In this part you are going to query the user to enter an odd number between 5 and 101 with the default value of 5 (use num\_points). This value is the number of points on the star. Do not worry about catching errors, but you can if you wish.
4. You are then going to draw a star on the screen that has that many points as long as the user enters an odd number.
5. A star can be drawn without taking the pen off the screen. Once you set the initial position you can draw the star just by turning the turtle the appropriate number of degrees. The algorithm is:
   1. All the lines that make up the star are the same length (shown in black below). You will make them 400 pixels long. In order to centre the star horizontally you will need to set your initial position to -200, 0.
   2. Once the user has entered the number of points to draw, calculate the amount the turtle has to turn (the turn angle) as 180 – (180/num\_points) where num\_points is the number of points the user entered.
   3. In a loop using range where it will loop 1, num\_points (INCLUSIVE) do the following (remember the last number of the range is NOT included)
      1. Move the turtle forward 400 pixels
      2. Turn the turtle right by turn angle degrees
   4. That’s it…that should draw a star of that many points
6. Remember to use exitonclick() at the end of the code to make sure your window stays open until you click on the canvas.
7. Once you have the star drawn, add a fill colour and fill the star with the colour. Then, change the pen colour.
8. Here is a screen shot of a 5-sided and a 31-sided star

**Part C – OpenAI**

1. Create a file called partc\_openai.py. You are going to create a chatbot author that writes a children’s story (suitable for 5 years olds) of at least 300 words based on the three items received in three separate prompts from the user. The prompts must be an animal, a body part and a landscape/timeframe. You may have to adjust the system content you provide in order to get the feeling for the story being generated.
2. Import the OpenAI class from the openai library.
3. Create an instance of the class OpenAI.
4. Prompt the user three times: first for an animal, second for a body part and third for a landscape/timeframe (1890’s New York City, Steampunk, etc)
5. Set up the chat completion using the system role explaining what skills it needs. Set up the system role to prompt for a proper length story using the three prompts. The wording of these two prompts may take some trial and error.
6. Test it and make sure the story matches the criteria.

**To submit**

When you have completed the lab exercise, call me over to mark it. Then, create a single zip file called YourUserId\_G40\_L05&6.zip and copy the file to the Moodle page for the course.