

National University of Singapore  
School of Computing  
CS1010X: Programming Methodology  
Semester II, 2021/2022

**Mission 5 - Side Quest**  
**Circle Manipulation**

Release date: 14 February 2022

**Due: 10 March 2022, 23:59**

**Required Files**

- sidequest05.1-template.py
- hi\_graph.py

**Information:**

For your convenience, the template file `sidequest05.1-template.py` contains a line to load the Python source file `hi_graph.py`. Use the template file to answer the questions.

This side quest consists of **two** tasks.

**Task 1: (2 marks)**

Execute the following code:

```
draw_connected(200, unit_circle)
```

Then execute the following:

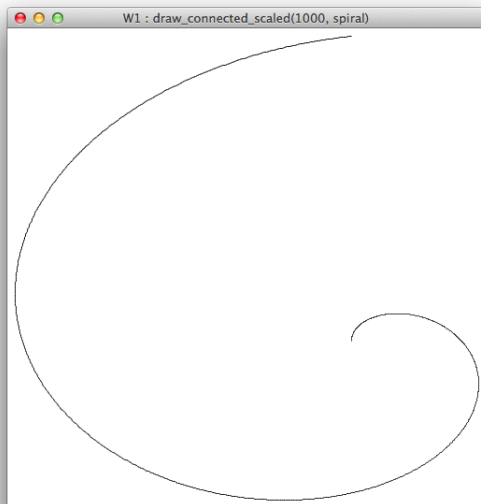
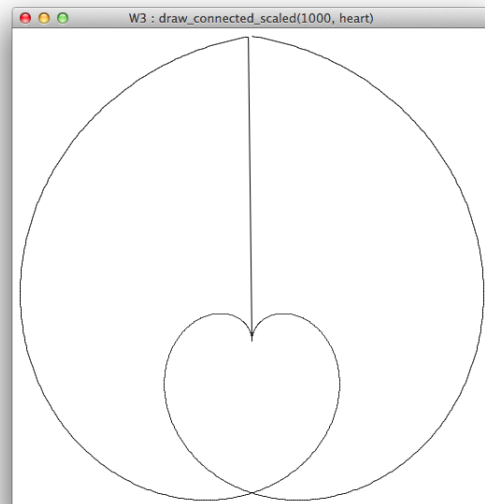
```
draw_connected(200, alternative_unit_circle)
```

Can you see a difference? Now try using `draw_points` instead of `draw_connected`. Also, try using other drawing functions to draw `unit_circle` and `alternative_unit_circle`.

Write down the difference between `unit_circle` and `alternative_unit_circle`. You should also point out why this difference exists by examining the code of both `unit_circle` and `alternative_unit_circle` in `hi_graph.py`.

**Task 2: (3 marks)**

- (a) Using the definition of the `unit_circle` as a reference, define a new curve `spiral` that draws a 'circle' which mimics a spiral.
- (b) Define a new curve `heart` that draws a curve by connecting 2 spirals. You should make use of your `spiral` function to produce the curve.

`draw_connected_scaled(1000, spiral)``draw_connected_scaled(1000, heart)`