Python Lab Task:

This lab task contributes to 7% of the overall coursework marks.

Last Submission Date: **30 April 2024, 5:00 PM**

You are to **work in teams of up to 4 people** to complete this project.

*We do expect that projects done with 4 people have more impressive writeup and results than those done individually.

IMPORTANT: Do ensure the code is **well documented.** Marks will be given based on your documentation.

Requirements

- Use the turtle graphics module to draw a picture. The theme of the drawing is either:
    - Underwater world (with rocks and sea creatures, etc.)
      or
    - Village life (with mountains, rivers, trees, clouds, paddy field etc.)
      or
    - Concrete jungle (with cars, skyscrapers, etc.)
- All codes are in **ONE** Python module names
  `<StudentMatrixNumber_1>_<StudentMatrixNumber_2>_<StudentMatrixNumber_3>_.py`
- There is a function called `mainDraw` that has **NO parameters** and can only be used to create turtles and call other functions.
- There are **at least SIX (6)** useful functions in the module, **EXCLUDING** the function `mainDraw`.
- There are at least **TWO (2)** functions (out of the required 6 function) that make use of the `for`-statement (loop) to generate patterns. These two functions must be called at least **twice** to generate patterns in the canvas.
- Make use of the `exitonclick()` as the last statement in your program to close the canvas when it is clicked.

Getting Started

- You may refer to the documentation for the turtle module at:
  http://docs.python.org/library/turtle.html

- Use the template provided to start your code.

Overview

Turtle graphic was introduced as part of the LOGO programming language in the late 1960's. For over fifty years it had allowed children to draw interesting shapes on their computer. And if they can do it, why not us? Fast forward to the 21st century, the turtle graphics lives on, and has been introduced in Python as a great way to familiarise students to the language. It is a simple and clear graphic programming language, providing a good basis to write functions as part of a program.

The idea behind the turtle graphic is based on a metaphor of a turtle moving around a canvas and drawing as it goes. Imaging a turtle is on a canvas holding a pen. The pen can either be down (touching

the canvas) or up (not touching the canvas). When the pen is down, the turtle leaves a trail when it is told to move to a new location. When the pen is up, the turtle moves to a new location without leaving a trail. The colour of the trail leave by the turtle can be changed at any time.

Let's write a simple Python to create a new turtle and start drawing.

```python
import turtle                  # Allows us to use turtles
scr = turtle.Screen()          # Creates a playground for turtles
jane= turtle.Turtle()          # Create a turtle, assign to jane
jane.forward(50)               # Tell jane to move forward by 50 units
jane.left(90)                  # Tell jane to turn by 90 degrees
jane.forward(30)               # Complete the second side of a rectangle
scr.mainloop()                 # Wait for user to close window
```
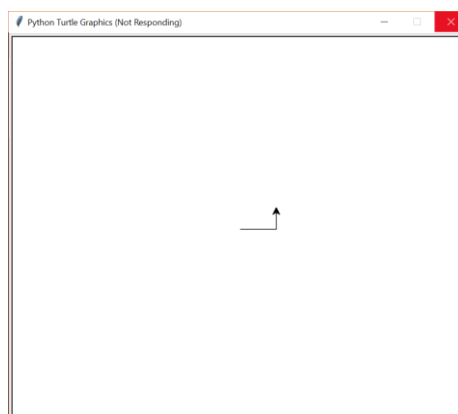

This task will familiarize you with what you've learned throughout the past few weeks. We will be using the Turtle graphic library and have some fun in the process.

Submission

Submit only **ONE** Python file (i.e., just the .py file). The filename should follow the following standard:
<StudentMatrixNumber_1>_<StudentMatrixNumber_2>_<StudentMatrixNumber_3>_<StudentMatrixNumber_4>_.py

Reminder

This work must be completed by you and your team members. The first instance of plagiarism will result in '**ZERO**' on this task.

If any part of your submitted work was taken as it is or altered from another student or materials from another source (including online solutions), it is considered as plagiarism. Plagiarism also includes allowing your peers to alter or revise your submitted work as their own.

Written by Kok Ven Jyn 2017 (rev. 2024)