CSCI 107, Third Practicum – December 14, 2022

Submit your solutions in a file named YourFirstName-YourLastName.py to the CSCI 107
Practicum 3 Dropbox *no later than 3:50 p.m.*

Question One. 25 points. Write a program that prompts the user for (1) their first name, (2) the day in December when they take their last final of Fall Semester and (3), the day in January when their first Spring Semester class meets. Calculate how many vacation days this person has, matching the format of the transcript below exactly. In the sample transcript, the person has 17 vacation days in December (the 15th through the 31st) and 17 days in January (the 1st through the 17th). You may assume all inputs will be valid.

```
=================== RESTART: C:/Users/n57g588/Deskto
Enter your first name: John
Enter the day of your last December final: 14
Enter the day of your first January class: 18
Enjoy 34 days of vacation John!
>>>
```

Question Two. 25 points. Recursion. Supply the missing function for the transcript below. The missing function takes two non-negative integers (for example, 2 and 4) as input. The function then calculates and returns the first integer exponentiated by the second integer (for example, 2**4 produces 16 since 2*2*2*2 is 16). **The function must be implemented using recursion**. Hint 1: The base case occurs when the second number is 0. Any number exponentiated by 0 is 1. Hint 2: For the general case, think about using recursion to solve a simpler case. For example, if the function is asked to calculate 7 ** 22, what is a slightly simpler problem whose answer you could use to determine the answer to the original problem of 7 ** 22?

for number in range(5):
  *print(3, "**", number, "=", recursive_exponentiate(3, number))*

```
=================== RESTART: C:/Users/i
3 ** 0 = 1
3 ** 1 = 3
3 ** 2 = 9
3 ** 3 = 27
3 ** 4 = 81
>>>
```

Question Three. 25 points. Strings. To form a word in Pig Latin, move all of the constants that appear before the first vowel to the end of the word and then add "ay". If the word starts with a vowel, just add "ay". For this question, assume that the only vowels are a, e, i, o and u and that all words will contain at least one vowel. The missing function should convert the word it is given into Pig Latin, while maintaining the case of all of the original letters. For example:

print("hello", latinize("hello"))
print("friends", latinize("friends"))
print("FRIends", latinize("FRIends"))
print("EaT", latinize("EaT"))

```
=================== RESTART: C:/Users/
hello ellohay
friends iendsfray
FRIends IendsFRay
EaT EaTay
>>>
```

Question Four. 25 points. More About Iteration. Supply the missing function for the program below. The missing function should draw a holiday tree using red and green squares with the specified number of rows. There should be one square in the first row, two squares in the second row, etc. Squares should alternate between red and green with the top square being green, the leftmost square in the second row being red, etc. Use all supplied code, but do not change it.

import turtle

def draw_square(tree, tree_color, width):
  tree.color("black", tree_color)
  tree.begin_fill()
  for _ in range(4):
    tree.forward(width)
    tree.right(90)
  tree.end_fill()

def main():
  tree = turtle.Turtle()
  tree.hideturtle()
  tree.speed(0)

  # (-10, 200) is upper left corner of top square
  # 20 is the side length of the square
  # 7 is the number of rows to draw
  draw_tree(tree, -10, 200, 20, 7)

main()

Python Turtle Graphics