CS 151 INTRO PYTHON SPRING 2022 PRACTICE MIDTERM I
Instructor Calvin Deutschbein

Roster Name	
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This exam will be timed to take 60 Minutes.

It will be scored out of 200 Points.

It will make up 20% of Final Grade.

SECTION _: REPRESENTATION **40 Points**

Part 0: Multiple Choice: *8 Questions @ 5 Points each =* *20 Points*

Which of the following statements is required to form a function?

- def
- for
- while
- return

Which of the following loops from -10 to 0, including -10 and 0?

- for i in range(-10,0,1)
- for i in range(-10,1,1)
- for i in range(-11,0,1)
- for i in range(-11,1,1)

Which of the following would allow use of the GOval method from pgl.py (as with Project-1)?

- from GOval import pgl
- from pgl import GOval
- import GOval from pgl
- import pgl from GOval

Which of the following statements is the best choice in order to run a code snippet a fixed number of times?

- def
- for
- while
- return

The decimal (base 10) value 100 is equal to 6 * 16 + 4. How can it be represented in hexademical (base 16), which is traditionally denoted with “0x” prefix (e.g. 0x10is decimal 16)?

- 0x100
- 0x64
- 0x46
- 0x16

The decimal (base 10) value 10 is equal to 2 ^ 3 + 2. How can it be represented in binary (base 2), which is traditionally denoted with “0b” prefix (e.g. 0b10 is decimal 2)?

- 0b1111
- 0b1010
- 0b1000
- None of the above

The decimal (base 10) value 1/6 (or one sixth) is expressed in decimal by .166… (repeating infinitely). How can it be represented in hexnary (base 6), where decimal 10 would be represented as 14 (1 * 6^1 + 4 * 6^0 or 6+4).

- 0.1111… (repeating infinitely)
- 0.2222… (repeating infinitely)
- 0.1
- 0.2

The decimal (base 10) value 1/4 (or one fourth) is expressed in decimal by .25. How can it be represented in octal (base 8), where decimal 10 would be represented as 12 (1 * 8^1 + 2 * 8^0 + 1 * 3^0 or 8+2).

- 0.1111… (repeating infinitely)
- 0.2222… (repeating infinitely)
- 0.1
- 0.2

SECTION I: PYTHON **60 Points**

Part 1: Short Answer: *2 Questions @ 10 Points each =* *20 Points*

What is the result of the following Python expression and what is its type?

```
8 * 5 + 7 % 4 - 9 // 3 ** 2 + 0 / 6
```

What is the result of the following Python expression and what is its type?

```
8 // 4 >= 2.0 and not 2 ** 3 > 10 or 13 % 0 == 2
```

Part 2: Short Response: *2 Questions @ 20 Points each =* *40 Points*

What output would the following program print?

```
def puzzle(t):
     def mystery(r, x):
          x += 1
          def enigma(s):
               return r[s::x]
          return enigma
     x = 2
     y = mystery(t, x)
     return y(x) + y(0)

t = "abcdefg"
print(puzzle(t))
```

Write a suitable doc-string (explanatory comment) for the function. Recall that a doc-string should be a high-level summary of what it is the function does. It should include:

- descriptions of what types of objects are allowed for each input parameter
- what type of object is returned at the end.

Be as specific as you can within the confines of the problem.

```
def f(a, b):
    c = ""
    for d in b[2:]:
        if d.isdigit():
            c = str(int(d) * a) + c
    return c
```

SECTION II: LANGUAGE **40 Points**

Part 3: Written Response: *4 Questions @ 10 Points each =* *40 Points*

As an object oriented language, everything in Python is an object of some kind. Describe briefly the uses of and differences between the following kinds of objects and the Python “None”

What is a float object?

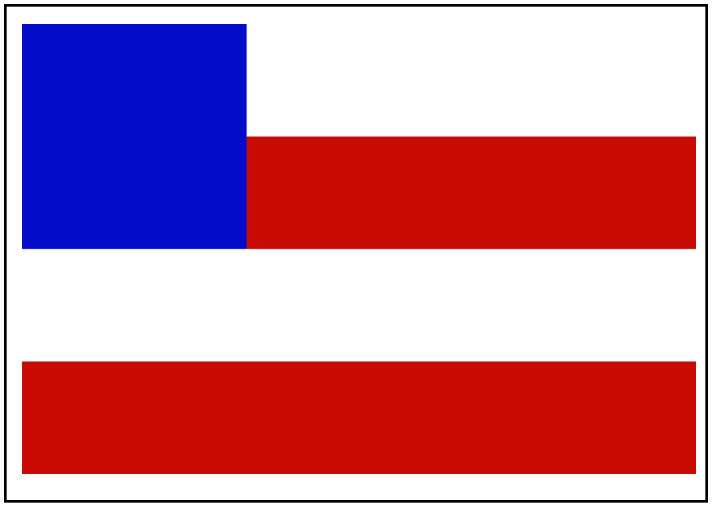
What is a GOval object?

What is a GWindow object?

What is None?

SECTION III: GRAPHICS **60 Points**

Part 7: Coding Exercise *60 Points*



This probably won't be printed in color.

In Black History Month, it is worth studying the political geography of the Americas in the context of Black History. While we live in the United States, where the state with the highest Black population percentage is Mississippi, in South America this state with the highest population percentage is Bahia, in Brazil. The flag of Bahia, or a slightly simplified version thereof, is shown above.

- The flag has four horizontal stripes, in white and red, alternating, beginning from the top
- In the upper right, there is a blue square of side length equal to two strips
- The flag is in a three by two ratio, that is, 3 pixels wide for every pixel tall.

Create a function Bahia that creates a 600 by 400 GWindow containing the flag of Bahia. You may assume the colors in pgl are defined to match the flag. You may use the function create_filled_rect, which is shown below:

```
def create_filled_rect(x, y, width, height, fill_col='black'):
    """
    Creates a GRect object with the desired fill color.
    The top left corner will be centered at x, y
    """
    rect = GRect(x, y, width, height)
    rect.set_filled(True)
    rect.set_color(fill_col)
    return rect
```