Functions with Outputs

CMPT 140

Exercise 1

What value is returned by the following function calls?

(a)

```
def cost_with_taxes( cost ):
    final_price = cost * 1.1
    return final_price

cost_with_taxes( 25.00 )
```

(b)

```
def rect_perimeter( w, l ):
    return 2*w + 2*l

rect_perimeter( 5, 3 )
```

Exercise 1 (ctn'd)

What value is returned by the following function calls?

(c)

```
def print_random_msg():
    language = "Python"
    print(language + " is named after a comedy series!")

print_random_msg()
```

(d)

```
def repeat_msg( msg, n_repeats ):
    print(msg * n_repeats)
    return

repeat_msg("ha",5)
```

Exercise 2

Write the following functions:

(a) `rect_area_from_dims( l, w )` : returns the area of a rectangle

- `l`: the length of the rectangle
- `w`: the width of the rectangle

Exercise 2 (ctn'd)

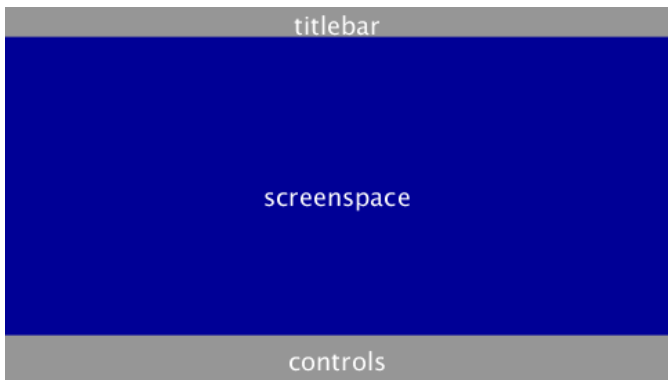
(b) `rect_area_from_coords( tl_x, tl_y, br_x, br_y )` : returns the area of a rectangle.

- `tl_x, tl_y`: (x,y) coordinates of the top-left corner
- `br_x, br_y`: (x,y) coordinates of the bottom-right corner

Exercise 2 (ctn'd)

(c) `screenspace( w, h, title_h, controls_h )` : returns the area of the usable (blue) part of the screen

- `w, h` : the total width and height of the entire screen
- `title_h` : height of the title bar
- `control_h` : height of the control bar



Exercise 3

What is printed to the console by the following programs?

(a)

```
def greatest_difference(a,b,c):
    return max(a,b,c) - min(a,b,c)

print( greatest_difference(3,-5,0) )
```

(b)

```
def clamp_to_canvas(x):
    return max(0, min(x, 100))

print( clamp_to_canvas(150) )
```

Exercise 3 (ctn'd)

What is printed to the console by the following program?

(c)

```
def overflow( password ):
    max_chars = 10
    extra = max( 0, len(password) - max_chars )
    return extra

overflow("meLoveCookies")
print("Your password is too long by: ")
print(extra)
print("characters")
```

Exercise 3 (ctn'd)

What is printed to the console by the following program?

(d)

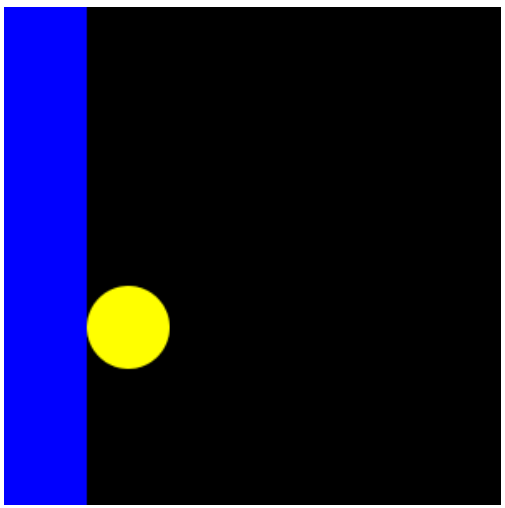
```
def update( x ):
     x = x + 2

x = 5
update(x)
print(x)
```

Exercise 4

We want to draw a circle that follows the mouse.

But the circle isn't allowed in the blue area:



Exercise 4 (ctn'd)

Assume you already have this code to get started:

```
1  d = 50  # size of the mouse-following circle
2  border = 50  # furthest left circle centre can be drawn
3
4  def setup():
5      size(300,300)
6      noStroke()
7
8  def circle_radius(diameter):
9      return diameter/2
10
11 def draw():
12     background(0,0,0)
13     # blue borders (circle can not be drawn in here)
14     fill(0,0,255)
15     global border
16     rect(0,0,border,height)
17     # draw the circle
18     fill(255,255,0)
19     global d
20     ellipse(circle_x(mouseX,border,diameter),mouseY,d,d)
```

Exercise 4 (ctn'd)

Your job: define the function `circle_x()`

- computes and **returns** the x-coordinate to use for the circle's center based on the mouse position

Hint 1: You may need to use `max()` or `min()`

Hint 2: Beware of the following case. It's not allowed!