

CS 453

Lab 1 - Basic Input, Calculations, and Output

What to submit? 3 programs: computingChange.py, ringArea.py, ???.py

Program 1: Name this program computingChange.py

In the textbook, section 2.7, there is a challenge activity that determines the number of five-dollar bills and one-dollar bills to give for a certain amount of change. The program fragment from the book is shown below. You can use this as a starting point for your program.

```
amount_to_change = int(input())

num_fives = amount_to_change // 5

''' Your solution goes here '''

print('Change for $', amount_to_change)
print(num_fives, 'five dollar bill(s) and', num_ones, 'one dollar bill(s)')
```

1. Start a new python program. Save the program with the name computingChange.py.

2. Add header comments using this template:

```
# computingChange.py
# CS 453
# Written by .....
# Date written .....
# Date/time last modified .....
# Purpose: This program calculates the number of bills needed to give change.
# Input: amount of change to give in dollars
# Output: number of bills (twenties, tens, fives, and ones)
```

3. Type the lines from Zybook Challenge Activity 2.7.2 and fill in the area that says ''' Your solution goes here ''' with a single statement that assigns num_ones with the number of one-dollar bills given in change.

It is highly recommended that you test the program at this point to make sure it correctly calculates the number of fives and ones.

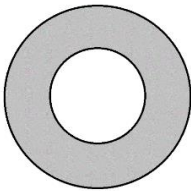
Now you'll make some changes to increase the usability of this program. A typical cash register drawer has twenties, tens, fives, and ones. We want this program to determine the change that would be given from the cash register.

4. As you add more statements, add inline comments that explain the major tasks performed in the program.
5. Insert statements to calculate the number of twenties and tens (before the number of fives is calculated).
6. Insert statements to print the number of twenties and tens (on a separate line, before the numbers of fives and ones are printed).
7. Test, debug, and test again until you are sure that your program works correctly.

Program 1, computingChange.py is now done.

Program 2: Name this program ringArea.py

1. Start a new Python program. Save the program as ringArea.py.
2. Insert header comments as shown in program 1 above.
3. Write a program that will find the area of a ring (gray shaded area in the image below). The input will be two float numbers: the radius of the inner circle and the radius of the outer circle.



4. The output should be the area of the ring, formatted with two digits to the right of the decimal point.

The output should have some meaningful text before the value of the area.

5. Include a few inline comments to document the major tasks in the program.
6. Test, debug, and test again until you are sure that your program works correctly.

Program 2, ringArea.py is now done.

Program 3: Give this program a name that corresponds to its purpose.

1. Start a new Python program. Save this program with a name that corresponds to its purpose.
2. Insert header comments as shown in program 1 above.

3. Think about a task from your field of study that requires basic calculations such as those we've covered in class so far. Design a Python program that performs the task. Your program should use the three steps: input, calculations, output.
4. When getting input, use a prompt so that the user of the program can understand what they are supposed to type.
5. Use inline comments to document the steps.
6. Test, debug, and test again.

Program 3, *your_program_name.py* is now done.
