

Objectives:

- Use variables to manipulate data in programs
- Perform simple processing with various operators
- Generate specific program output using formatted string

Tutorial participation (1%):

- t2_vpl_1
- Submission period: **within your OWN tutorial period**

Tutorial/take-home exercises (2%):

- Remaining problems in the worksheet
- Submission deadline: **noon, 15-FEB-2023 (Wednesday)**

t2_vpl_1. Write a program to calculate the area of a rectangle. User inputs are two **non-negative integers**, which are the width and height of a rectangle. The program computes and outputs the area of the rectangle with the following format.

Samples

```

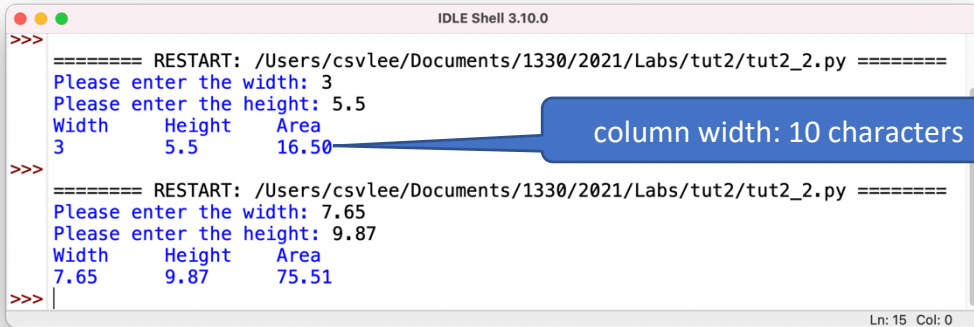
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_1.py =====
Please enter the width:
3
Please enter the height:
5
The area is 3*5=15
>>>

===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_1.py =====
Please enter the width:
7
Please enter the height:
9
The area is 7*9=63
>>>
    
```

(Note: characters in **blue** are displayed by the program and characters in **black** are inputted by user)

t2_vpl_2. Extend the program in t2_vpl_1 such that the user inputs are two **non-negative numbers**. The program computes and outputs the area of the rectangle with **2 decimal places in table format**. Note that the format of the two input numbers shown in the table remains no change.

Samples



```
>>> ===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_2.py =====
Please enter the width: 3
Please enter the height: 5.5
Width      Height      Area
3          5.5        16.50
>>> ===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_2.py =====
Please enter the width: 7.65
Please enter the height: 9.87
Width      Height      Area
7.65       9.87       75.51
>>>
```

column width: 10 characters

Hint: Use the following to print a string without new line. By default, there is a new line after a string output by a print statement.

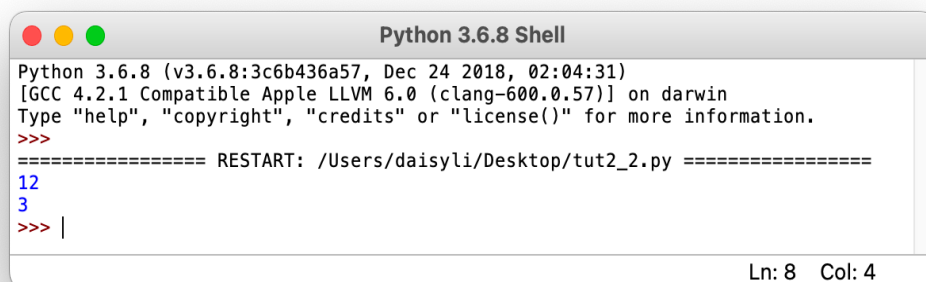
```
print(string_to_print,end='')
```

Example:



```
print('1',end='')
print('2')
print('3',end='')
```

Ln: 3 Col: 17

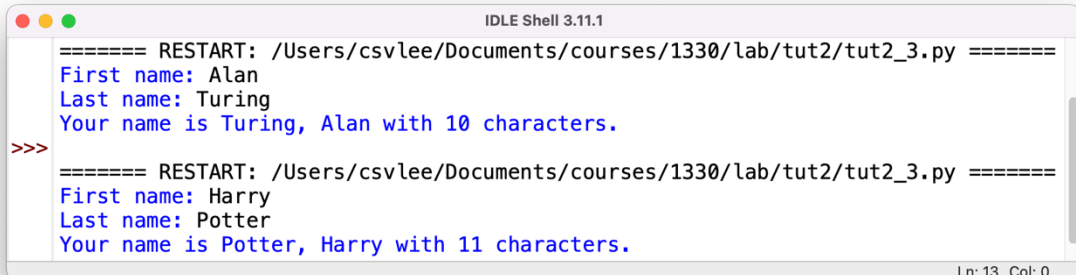


```
Python 3.6.8 Shell
Python 3.6.8 (v3.6.8:3c6b436a57, Dec 24 2018, 02:04:31)
[GCC 4.2.1 Compatible Apple LLVM 6.0 (clang-600.0.57)] on darwin
Type "help", "copyright", "credits" or "license()" for more information.
>>>
===== RESTART: /Users/daisyli/Desktop/tut2_2.py =====
12
3
>>> |
```

Ln: 8 Col: 4

t2_vpl_3. Write a program to ask for the user's first name and last name and output the name in the following format (last name followed by a comma and the first name), with the number of characters in the name.

Samples

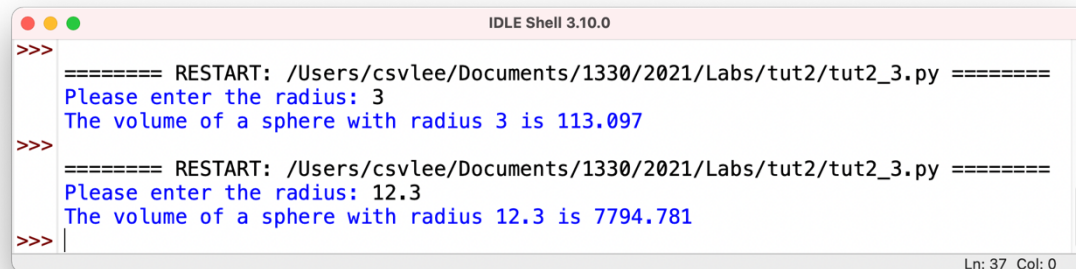


```
===== RESTART: /Users/csvlee/Documents/courses/1330/lab/tut2/tut2_3.py =====
First name: Alan
Last name: Turing
Your name is Turing, Alan with 10 characters.
>>>
===== RESTART: /Users/csvlee/Documents/courses/1330/lab/tut2/tut2_3.py =====
First name: Harry
Last name: Potter
Your name is Potter, Harry with 11 characters.
```

t2_vpl_4. Write a program to find the volume of a sphere with radius r using the following formula and output the volume with **3 decimal places**. Note that the format of the input radius remains no change.

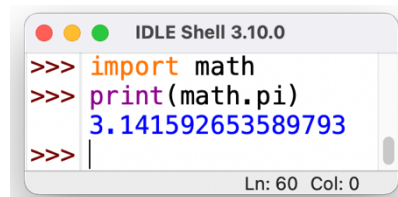
$$V = \frac{4}{3}\pi r^3$$

Samples



```
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_3.py =====
Please enter the radius: 3
The volume of a sphere with radius 3 is 113.097
>>>
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_3.py =====
Please enter the radius: 12.3
The volume of a sphere with radius 12.3 is 7794.781
>>>
```

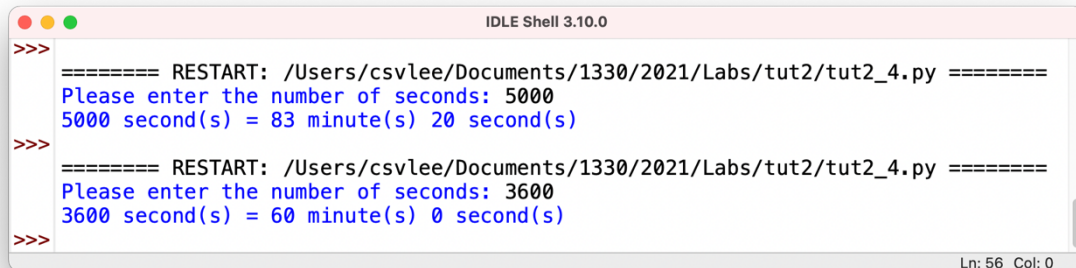
Hint: To access the value of `pi`, you may import the `math` module provided by Python as follows.



```
>>> import math
>>> print(math.pi)
3.141592653589793
>>>
```

t2_vpl_5. Write a program to read in the number of seconds (unit: seconds) and convert the input to minutes and seconds.

Samples

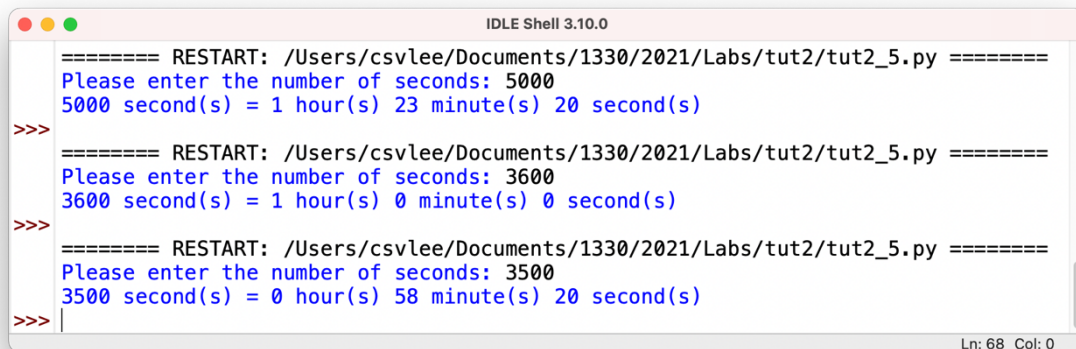


```
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_4.py =====
Please enter the number of seconds: 5000
5000 second(s) = 83 minute(s) 20 second(s)
>>>
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_4.py =====
Please enter the number of seconds: 3600
3600 second(s) = 60 minute(s) 0 second(s)
>>>
```

Ln: 56 Col: 0

t2_vpl_6. Extend the program in t2_vpl_5 such that the program converts the input to hours, minutes, and seconds.

Samples



```
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_5.py =====
Please enter the number of seconds: 5000
5000 second(s) = 1 hour(s) 23 minute(s) 20 second(s)
>>>
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_5.py =====
Please enter the number of seconds: 3600
3600 second(s) = 1 hour(s) 0 minute(s) 0 second(s)
>>>
===== RESTART: /Users/csvlee/Documents/1330/2021/Labs/tut2/tut2_5.py =====
Please enter the number of seconds: 3500
3500 second(s) = 0 hour(s) 58 minute(s) 20 second(s)
>>>
```

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