Objective:

- The objective of this lab is to focus on Console Input, Type Coercion and Type Casting, Math Library Functions, C Style Strings, and formatted output.

Challenge-A: Exchange **(0)**

Write a program that reads in two variables and swaps the value of these variables.

You are not allowed to use any extra variable.

Challenge-B: Upper Case **(0)**

Write a program that prompts the user to enter an alphabet in small caps (a, b, c, … … … z) and display the entered alphabet into its upper caps (A, B, C, … … … Z).

Sample Run:

Enter English Alphabet in Lower Case: a
The Equivalent upper Case English Alphabet: A

Challenge-C: Sweet Dreams **(0)**

Write a program that plays a word game with the user. The program should ask the user to enter the following

- His or her name
- His or her age
- The name of his city
- The name of his college
- His profession
- His pets name
- Animal type of his pet

After the user has entered these items, the program should display the following story, inserting the user's input into the appropriate place:

There once was a person named *NAME* who lived in *CITY*. At the age of *AGE*, *NAME* went to college at *COLLEGE*. *NAME* graduated from *COLLEGE* and went to work as a *PROFESSION*. Then, *NAME* adopted a(n) *ANIMAL* named *PETNAME*. They both lived happily ever after!

Challenge D: Current **(0)**

Write program, which calculates the following formula. The current in an alternating current circuit that contains resistance, capacitance, and inductance in series is given by

$$I = \frac{E}{\sqrt{R^2 + \left(2\pi fL - 1/(2\pi fC)\right)^2}}$$

Where I = current (amperes), E = voltage (volts), R = resistance (ohms), L = inductance (henrys), C = capacitance (farads), and f = frequency (hertz). Write a program that reads values for the voltage, resistance, capacitance, Inductance, and frequency and then calculates and displays the current.

Challenge-E: Sum Angles **(0)**

Angles are often measured in degrees (`), minutes ('), and seconds ("). There are 360 degrees in a circle, 60 minutes in one degree, and 60 seconds in one minute. Write a program that reads two angular measurements given in degree, minutes, and seconds, and then calculates and displays their sum. You may verify your logic on the following equalities

74`29'13" + 105`8'16" = 179`37'29"
7`14'55" + 5`24'55" = 12`39'50"

20`31'19" + 0`31'30" = 21`2'49"

Note: The decimal value for character shown in sample run is as follows:

` 96
' 39
" 34

Sample Run:

```
Enter Degrees: 72
Enter Minutes: 29
Enter Seconds: 13
Enter Degrees: 105
Enter Minutes: 8
Enter Seconds: 16
   74` 29' 13"
+ 105`  8' 16"
--------------------
  179` 37' 29"
```

Note: To get full credit, your code output should be as close as possible to the sample run given above.

Challenge-F: Math Tutor **(0)**

Write a program that can be used as a math tutor for a young student. The program should display two random numbers to be added, such as

```
  247
+ 129
---------
```

The program should then pause while the student works on the problem. When the student is ready to check the answer, he or she can press a key and the program will display the correct solution:

```
  247
+ 129
---------
  376
```

Both the random numbers will be greater than zero and maximum 5 digits.

Sample Run:

```
*****Kangaroo Math Competition*****
   247
+   129
--------
Hey Kido! When you solve it in your mind → Press Enter key to verify your answer:
   247
+   129
--------
   376
```

Note: To get full credit, your code output should be as close as possible to the sample run given above.

Note: *Before next lecture, try to attempt all the questions given in chapter-3 of your textbook.*

They can. Because they think, they can.