# CS 150 Lab 3
## Arithmetic and the Debugger

The main objective of today's lab is to use some basic mathematics to solve a few real world problems. In doing so, you are to begin getting accustomed to using the Visual Studio debugger.

Be sure your output looks exactly like the specified output.
Be sure to submit the completed project to **CS150-02 Lab** when you are done.
Be sure to use the program skeleton and add comments to your code!
Show the instructor or TA your solution to each problem before submitting.
You do not need to submit the challenge question!

## Lab 3.0
Go through the debugger example with the instructor & TA.

## Lab 3.1

Fahrenheit to Celsius

Add a project called **03_1_TemperatureConversion** to your **PUNetIDLabs** solution. This project is to convert a fahrenheit temperature to both centigrade and kelvin. The conversion formulas are:

$$C = \frac{5}{9}(F - 32)$$

$$K = \frac{5}{9}(F - 32) + 273$$

Sample Input/Output where the fahrenheit temperature is the only input shown in bold below.

```
***********************
| Temperature Converter|
***********************

Enter a non-negative fahrenheit temperature: 212

212 fahrenheit is 100 centigrade

212 fahrenheit is 373 kelvin
```

1) Briefly describe the data that your program will need to use.

2) List the variable declarations necessary to store the data listed in 1.

3) Write a complete program for the above problem.

4) Show the instructor/TA that you can step through your solution with the debugger.

5) Print a color copy of your solution and place the copy on the front desk.

**Lab 3.2**

Add a project called **03_2_TimeConverter** to your **PUNetIDLabs** solution. This project is to convert a number of seconds into hours, minutes, and seconds in a format like HH:MM:SS.

Sample Input/Output where the total number of seconds is the only input shown in bold below.

```
********************
|  Time Converter  |
********************

Enter seconds since day began: 100

The time is 0:1:40
```

1) Briefly describe the data that your program will need to use.

2) List the variable declarations necessary to store the data listed in 1.

3) Write a complete program for the above problem.

**Optional Challenge:**

Always print your time as HH:MM:SS so the above time would show 00:01:40

Once both projects are completed, place your solution **PUNetIDLabs** into the **CS150-02 Drop** folder on Turing. Your solution is to have all four projects completely working and correct.