BLG102E
LAB SESSION THIRD WEEK

(1)Extended Version of Root of a Second Degree Polynomial

- A second degree polynomial has the form:

$$ax^2 + bx + c$$

- In order to solve it, we first need to find discriminant

$$\text{discriminant} = b^2 - 4ac$$

- Then, the roots can be found as

$$x1 = ((-b) + \text{sqrt}(\text{discriminant})) / (2a)$$
$$x2 = ((-b) - \text{sqrt}(\text{discriminant})) / (2a)$$

- Write a C program that
  - Asks for a, b, and c coefficients
  - Calculates discriminant
    - If disciriminant is smaller than zero
      - Than means that in real numbers, this equation has no root; prints out a message
    - Else if disciriminant equeal to zero;
      - That means that there is only one root, prints out it to screen,
    - Otherwise, disciminant is bigger than zero
      - That means that there are two roots, prints out them to screen

(2) Format Your Code with clang-format

- You can style your C code with **clang-format** tool
- It can help you remove styling problems (i.e., indentation, broken lines, …etc)
- You can specify use of a format **style** with the following command:

  clang-format -style webkit
- You can apply the selected style to an **input** file with the -i option:

  clang-format -style webkit -i input_file.c
- To get **help** for more options use the -h option:

  clang-format -h

(3.1) Water State at Sea Level

- Water is liquid, solid, or gaseous at a given temperature at sea level :
  - Water becomes solid (i.e., freezes) at 0° Celsius or 32° Fahrenheit.
  - Water becomes gas (i.e., boils) at 100° Celsius or 212° Fahrenheit.
  - Water is liquid in between these two temperatures.

- Write a C program that
  - Asks and reads a temperature value and the letter C for Celsius or F for Fahrenheit.
  - Decides on the state of water at the given temperature at sea level
  - Prints out whether water is liquid, solid, or gaseous at the given temperature at sea level

(3.2) Calico Test for Water State at Sea Level

- Use Calico:
  - python –m calico.cli water1.t
  - You should not change the water1.t
  - https://calico.readthedocs.io/en/latest/tutorial.html#basics
- Revise your C program that
  - Passes the cases of water1.t
- In Exam, you will be given a test file and your code will be graded accordingly.

(4.1) Water State above Sea Level

- The boiling point of water drops by about one degree celsius for every 300 meters of altitude.

- Write a C program that
  - Asks and reads a temperature value and the letter C for Celsius or F for Fahrenheit.
  - Asks and reads the altitude in meters.
  - Decides on the state of water at the given temperature at the given altitude.
  - Prints out whether water is liquid, solid, or gaseous at the given temperature at the given altitude.

(4.2) Calico Test for Water State at Sea Level

- Use Calico:
  - python –m calico.cli water2.t
  - You should not change the water2.t
  - https://calico.readthedocs.io/en/latest/tutorial.html#basics

- Revise your C program that
  - Passes the cases of water2.t

- In Exam, you will be given a test file and your code will be graded accordingly.