SE Lab (Lab 7) Worksheet **Name ___Hunter Befort_____**

Section ____007_____

Rev A 10/24/2022

Please complete the following steps to complete the lab:

1. Make sure you have read the information in the assignment to understand what commands to issue.
2. Use your RPi 4b that you have configured (not one you are sharing with another student). In other words, your RPi should have a hostname that matches your NetID.
3. Download the tarfile (lab7.tar) from Canvas to your home directory on the Rpi. Untar the file (tar xf lab7.tar).
4. Examine all the files, and annotate if they are executable, executable with debug information, or source code.

File:	Contents:
__dead.c_____	__source code_____
__temp.c_____	__source code_____
__trig_____	___executable with debug__
__trig.c_____	__source code_____
_____	_____
_____	_____
_____	_____
_____	_____
_____	_____

5. Display the source code for the executable named “trig” on a terminal screen on the Rpi. Use gdb to list the source.
6. Take a screenshot of your terminal window by pressing “Print Screen” on your keyboard or using the command scrot. It should capture the commands of step 5.
7. **Rename** the screenshot created to: lastname_netid_lab7_trig.png

8. Compile and then run the program dead.c in the debugger by single stepping. Write down the functions called in order from main (do not forget to set an initial breakpoint at main(), and then single step from that point):

_main()_____

_a()_____

_b()_____

_c()_____

9. Read over the file temp.c . This program does the following:

a. Opens the /proc entry for the rpi temperature sensor
b. In a loop that executes 10 times
    i. Reads the Rpi temperature and stores the value in an array
    ii. Converts from degrees C to degrees F
    iii. Suspends for 1 second
c. The average, minimum and maximum temperature are calculated
d. Print the results

10. There are several asserts defined in the source. List them below and describe what it might mean if they were false.

Line Number	assert expression	Describe
39	Assert(fd)	if false, the device is not opened and the program exits
57	Assert(degs_f > 0.0 && degs_f < 300.0)	If false, degs_f is not within the bounds of 0.0 and 300.0 and the program exits
76	Assert(n)	If false, n = 0, so the while loop never ran so i = 0 and the program exits

77	Assert(min <= max)	If false, then the while loop never ran and the program exits

11. Compile the program with **asserts disabled**. Use the debugger to identify the problem with the source code. List below the problem and suggest a solution: (Note: you can ask the TA for help, be prepared to explain what you see before they give you any hints)

Suggestion: Use the "n" command to single step.

Problem:

i increments while the loop is waiting for it to reach 0, but it never will since i is initialized at 10

__i++;_____

Suggested Solution:

change i++ to i- - so the while loop has a finite end point instead of just looping indefinitely

_____

Note: There are two defects in this code. You may need to remove your "solution", determined above from the source code prior to the next step.

12. Make the changes to the source code and recompile with **asserts enabled.** Run in the debugger.

13. Take a screenshot of your terminal window by pressing "Print Screen" on your keyboard or using the command `scrot`. It should capture the commands of step 12.

14. Rename the screenshot created to: lastname_netid_lab7_assert.png

15. Describe the information provided by the assert below. Is this a defect in the program's source code?

__when checking for a min value in degs_f, it only checks if degs_f is greater than min, but min is set as the max number so degs_f can never be greater than min and never checks if degs_f is smaller (therefore becoming the min). This can be solved by replacing the > with a < in the if statement on line 61_____
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16. Upload the following items to canvas:

- This worksheet with your name and section number completed
- The 2 screenshots listed above

You must show your assignment to the grader before uploading it to Canvas.

Thank you for attending the lab.

In the next lab, we will be writing and debugging networking code between computers. -

Professors Losh and Davis

Lab 4 Rubric

Assignment:
-40: Not completing Familiarization lab prior to turning in lab
-20: No credit
-10: Partial credit