

PRG155 – Programming Fundamentals Using C

Prof. W Hesham

Lab 8: for loop

Marks: 2

Due Date:	July 23 2026 beginning of lab class
Late Policy:	ALL LATE SUBMISSIONS WILL RECEIVE A GRADE OF ZERO (NO CREDIT)
File(s) to be Submitted:	Attach a source code "lab8.c"
Assignment Delivery Method:	Electronic Submission to Blackboard ("Assignments Folder")

Write a working C program using a for loop that will do the following:

1. Include comments at the beginning of the program as shown below:

```
/*  
program: lab8.c  
author: firstName lastName  
date: today's date  
purpose: using for loop  
*/
```

2. Develop a C program that turns on the BLUE led and then asks the user how many temperature readings will be taken. The program then turns off the BLUE led, turns on the HEATER, and turns on the GREEN led. The program then repeatedly displays the temperature number being read on the 7-Segment display (1, 2, 3, ...) and then reads the temperature. The program should pause for 100 ms before reading the temperature. Between each temperature reading, the program will pause for 1 second. During the pause, the program turns off the GREEN LED and turns on the YELLOW LED. When the pause is finished, the program turns off the YELLOW LED and turns the GREEN LED on again. Once the user has taken the specified number of temperature readings, the program should turn off the HEATER and report the average temperature. Be sure to use an appropriate type for the temperature. Display the average temperature on the 7-Segment display with 2 decimal places. The program should wait for the user to press ANY button and then release the button before it ends.
E.g.

```
How many temperature readings will be taken? FIFTY  
Not a valid amount!  
How many temperature readings will be taken? 50  
The average temperature from 50 readings is displayed.
```

3. You must use a for loop in your solution.
4. If the user enters an invalid value for the number of temperature readings (not a value or a 0 or negative value), the program must display an "invalid amount" message, turn on the BUZZER and RED LED and waits for the user to activate and then release any push button, and then turn off the BUZZER and RED LED and ask the user to enter the amount again (as shown above).
5. Marks will be awarded for program structure including proper tab indentation and descriptive camel case variable names.
6. Save the program as lab8.c and submit it electronically on the Blackboard.

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Helpful Device Alpha functions and notes

`DisplayIntValue(intVar); //int var or direct int`

`SetHeaterState(HEATER, ON); //heater ON`
`SetHeaterState(HEATER, OFF); //heater OFF`

`double temperature;`
`temperature = GetTemperature(TEMPERATURE_SENSOR);`

`DisplayDoubleValue(varDouble, 2); //double variable/direct double , decimals`

Notes:

Wait 100 ms before reading the temperature

- Allows the 7-segment display to update the reading number
- Gives the temperature sensor a short moment to stabilize
- Without this delay: the reading might happen too quickly, causing the display to flicker or the sensor value to be slightly inaccurate

Wait 1 second after each reading

- Creates a clear pause between readings
- Lets the user see the LEDs switch and the readings progress at a steady pace

Without this delay: the program would run too fast,
all readings would happen almost instantly, and the user wouldn't see each step