

# Temperature Analyzer

Workshop 3 (worth 3% of your final grade)

In this workshop, you are to write a program that accepts the high and low temperatures for several days and performs some calculations on them.

## LEARNING OUTCOMES

Upon successful completion of this workshop, you will have demonstrated the abilities:

- to create a simple interactive program
- to use a selection construct to code a decision
- to use an iteration construct to code repetitive logic
- to nest a logical block within another logical block
- to describe to your instructor what you have learned in completing this workshop

## SUBMISSION POLICY

Your workshops are divided into two sections; [in\\_lab](#) and [at\\_home](#).

The “[in\\_lab](#)” section is to be completed **during your assigned lab section**. It is to be completed and submitted by the end of the workshop. If you do not attend the workshop, you can submit the “[in\\_lab](#)” section along with your “[at\\_home](#)” section, but there will be a reduction from 40% to 10% for the “[in\\_lab](#)” portion. The “[at\\_home](#)” portion of the lab is **due the day before your next scheduled workshop**.

All your work (all the files you create or modify) must contain your name, Seneca email and student number.

You are responsible for regularly backing up your work.

## IN-LAB: ITEM CLASS (50%)

Download or clone workshop 3 from <https://github.com/Seneca-144100/IPC-Workshop3>

Code a program in `temps.c` that does the following:

1- Before the declaration of main define NUMS as 3: `#define NUMS 3`

2- Print the title of the application.

```
>----- IPC Temperature Analyzer -----<
```

3-Using a for loop, prompt the user to enter the high and low values for each of NUMS days. The values entered must be between -40 and 40, and high must be greater than low.

Print the following messages:

```
>Enter the high value for day 1: < (or day 2, or day 3)
```

\* Read the high value.

```
>Enter the low value for day 1: < (or day 2, or day 3)
```

\* Read the low value.

3- Use a nested while (or do-while) loop to analyze the results, high must be greater than low, high must be less than 41, low must be greater than -41

\*If any entry is incorrect, prompt the user to enter again until the entries pass the tests:

```
> Incorrect values, temperatures must be in the range -40 to 40, high must be greater than low. <
```

Then prompt again for the high and low temperatures for the day.

4- When the user has correctly entered the high and low temperatures, add them to variables that will store the `total high` and `total low` temperatures for NUMS days.

5- When the loop finishes calculate the average (mean) temperature for NUMS days and display:

```
> The Average (mean) temperature was: -- <
```

Output Example

----- IPC Temperature Analyzer -----

Enter the high value for day 1: 8

Enter the low value for day 1: -2

Enter the high value for day 2: 9

Enter the low value for day 2: -4

Enter the high value for day 3: 11

Enter the low value for day 3: 5

The average (mean) temperature was: 4.50

Output Example with Errors Handled *(use this data for submission)*

----- IPC Temperature Analyzer -----

Enter the high value for day 1: 8

Enter the low value for day 1: -2

Enter the high value for day 2: 41

Enter the low value for day 2: -4

Incorrect values, temperatures must be in the range -40 to 40, high must be greater than low.

Enter the high value for day 2: 9

Enter the low value for day 2: -4

Enter the high value for day 3: 5

Enter the low value for day 3: 11

Incorrect values, temperatures must be in the range -40 to 40, high must be greater than low.

Enter the high value for day 3: 11

Enter the low value for day 3: 5

The average (mean) temperature was: 4.50

## IN\_LAB SUBMISSION:

To test and demonstrate execution of your program use the same data as the output example above.

If not on matrix already, upload your [temps.c](#) to your matrix account. Compile and run your code and make sure everything works properly.

Then run the following script from your account: (replace profname.proflastname with your professors Seneca userid)

```
~profname.proflastname/submit 144_w3_lab <ENTER>
```

and follow the instructions.

Please note that a successful submission does not guarantee full credit for this workshop.

If the professor is not satisfied with your implementation, your professor may ask you to resubmit. Resubmissions will attract a penalty.

## AT\_HOME: (40%)

After completing the [in\\_lab](#) section, upgrade [temps.c](#) to

- process a 4-day period using a single change to your in\_lab code
- display the highest temperature, and on which day it occurred
- display the lowest temperature, and on which day it occurred
- calculate and display the mean temperature for the 4-day period.

### Output Example

```
----- IPC Temperature Analyzer -----
```

```
Enter the high value for day 1: 8
```

```
Enter the low value for day 1: -2
```

```
Enter the high value for day 2: 9
```

```
Enter the low value for day 2: -4
```

Enter the high value for day 3: 11

Enter the low value for day 3: 5

Enter the high value for day 4: 10

Enter the low value for day 4: 3

The average (mean) temperature was: 5.00

The highest temperature was 11, on day 3

The lowest temperature was -4, on day 2

## AT-HOME REFLECTION (10%)

Please provide brief answers to the following questions in a text file named `reflect.txt`.

- 1) Name all the iteration constructs?
- 2) Explain the difference between a “do while” and a “while” loop?
- 3) What is a conditional expression?

## AT\_HOME SUBMISSION:

*Submission is currently closed, please check this page later again.*

~~To test and demonstrate execution of your program use the same data as the output example above... (8, -2, 9, -4, 11, 5, 10, 3)~~

~~If not on matrix already, upload your `temps.c` and `reflect.txt` to your matrix account. Compile and run your code and make sure everything works properly.~~

~~Then run the following script from your account: (replace profname.proflastname with your professors Seneca userid)~~

~~`~profname.proflastname/submit 144_w3_home <ENTER>`~~

~~and follow the instructions.~~

~~Please note that a successful submission does not guarantee full credit for this workshop.~~

~~If the professor is not satisfied with your implementation, your professor may ask you to resubmit. Resubmissions will attract a penalty.~~