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Assignment 3 – Project Plan

Understanding: This assignment is asking me to write a program that:

1. Asks the user how many integers they will be inputting into the program.
2. Asks the user to input however many integers they told the program they would enter in Step 1.
3. Find the maximum and minimum of the set of integers entered by the user and return them to the user.

Step 2 will utilize a new technique we learned this week – the “for” loop. Using an iteration variable, the program will repeatedly ask the user to enter an integer until the program has been given the number of integers specified by the user in Step 1.

This requires a “for” loop because the number of integers varies depending on what the user wants, and passing the number of integers (entered by the user) into the “for” loop as the iteration variable ensures that the program asks the user for the correct amount of integers as specified in Step 1, no more and no less. Step 2 can also use a “while” loop with an iteration variable but I prefer to use a “for” loop.

The “for” loop will include another new technique we learned this week – “if” statements. The first “if” statement will only run the first time that the “for” loop runs. Using a flag (another new concept), it will assign the first inputted integer to the variables holding the maximum and minimum values. At the end of the “for” loop are two more “if” statements that will check to see if the most recently entered number is greater than the current maximum or less than the current minimum. The first entered number is automatically stored as the maximum and minimum, but when the program gets to the 2nd number, and each number thereafter, it needs to determine if the number is the new max or the new min or neither.

Using two variables to store the current max and min, the program will compare the most recently entered number to the numbers stored in those variables. If the most recent number is less than the number stored in the current min variable, the program will replace the value in the current min variable with the most recent number. Same goes for the max – if the most recent number is greater than the value stored in the current max variable, the program will overwrite the value in the current max variable and replace it with the most recent number. Once the program has checked to see whether or not the most recent number is a new min or max, it will go back to the top of the “for” loop,

waiting for the user to input the next number. After reading each input from the user the program will return the final maximum and final minimum to the user.

Testing Plan:

Description of Test	Expected Result of Test
Tell program that I only want to enter 1 integer. That integer is -100.	The max and min are both -100
Tell program that I will enter 5 integers. 4 of them are the same (10) and one of them is 9	The max will be 10 and the min will be 9
Enter 10 integers, all of them 0	Max and min are both 0
Enter 20 numbers, 5 are 0, 1 is -1, 10 are -1.9, 2 are 10, 2 are 10.9	Min will be -1 and max will be 10
Enter 5 numbers: 1.2, 1.4, 1.6, 1.8, 1.999	Max and min are both 1

Design:

Ask user for number of integers they will input

Ask user to input integers one at a time

Set input counter to 1

While input counter <= number of integers user wants to input

 Read input from user

 Set first input as maximum and minimum, go back to top of loop

 Starting with 2nd input:

 If input > current max

 Replace the current max with the input

 If input < current min

 Replace the current min with the input

 Back to top of loop until all integers have been read.

Return the max and min to the user