Compiling and testing Instructions

Compiling the program requires installing a code editor on the computer, I have chosen the Visual Studio Code Software. To install it we can go to the Visual Studio Code official website, download the version suitable for our operating system, and then install it by following the installation steps.

We must set the C++ Development Environment, in my case, as Windows user, I chosen the MinGw compiler, that includes the G++ compiler, which is part of the GNU Compiler Collection (GCC). It is a free and open-source compiler that supports multiple programming languages, including C and C++. To install it we visit the website MinGW download page, download the suitable version, after finishing installing, you can check it by opening the Command Prompt and typing 'g++--version', you should get info about g++ if correctly installed. Then please add the MinGW to the system path by navigating into the Environment Variables in the computer Settings, edit the Path by pasting the path of the Bin file of the Mingw installed on your computer.
Create a folder in the path you wish on your computer, and then open the Visual Studio Code, in the File tab on the top left of the program, open the Folder you created on computer, create new file and give it any name.cpp.

Now you are in the VS code and having an empty file inside a folder you know its path, simply copy the code from the project and paste it into the file in the VS code, and save it by CTRL + S, or another option is to copy the file code from the project and paste it in the folder directly.

On both cases we need to create the executable file through the Prompt Commander window, you can open it from the path of the folder you created, on the top of the folder type cmd and enter, the prompt window should open, type ' g++ -o name.exe name.cpp ', this will compile the cpp file you named before and create an executable file in the name you choose .exe, in the same directory, also you are able to see it in the VS code if you open it.

Now we need to work on the Arduino Ide side, install it from its official website and choosing the correct version, connect the Arduino board to your computer and open the Arduino Ide, choose the board and port correctly from the top left Tools and then open a New Sketch from File tab, paste the Arduino code you have from the project inside the sketch, click the right arrow button in the top left corner of the Arduino Ide to upload the code to the Arduino board. The Ide will compile the code again and then upload it to the board. You will see messages in the console indicating the progress and success of the upload. Monitor the Serial Output by opening the Serial Monitor and see the serial output from the board. It is important to ensure the baud rate at the bottom of the Serial Monitor matches the baud rate set in your code (19200).

Now proceed in the VS code and open New Terminal, execute the code from the down new opened terminal, you can execute it by typing the name of code and follow it with .exe and back slash, you should get Type First Number, note that if the serial port did not connect, try to close the Arduino Ide after successfully uploading the code to the board, because sometimes it is advised to close the Arduino IDE because it can occupy the serial port, preventing other applications like VS Code from accessing it. Closing the Arduino IDE ensures the serial port is free for use by other applications.

Now the program should work normally and efficiently and to try test it yourself you can do it by couple methods. First you can try typing high volume of inputs and rapidly to check how the program will handle it without to crash or making long delays.

Another way is to give invalid or divide by zero or using large numbers, this will verify the program will properly manage these answers.
Have potential users interact with the program and provide feedback on its functionality and usability. This real-world testing can reveal issues that may not surface during controlled tests.
Monitor the logging in both the PC and Arduino code to trace where issues may occur. Check the logs to ensure data is correctly sent, processed, and received.
These steps are enough to ensure the functionality and normal working of the program, in addition executing the file will create a saved_logging file that you can check also for all operations performed.

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