1. Environment setup for C++

1) Install MSYS2

Install to the default path: C:\msys64.

1. Open the Start menu, run MSYS2 UCRT64

2. Update the package database and core system:

```
pacman -Syu
```
If it tells you to close the window, do so, then reopen MSYS2 UCRT64 and run once again:

```
pacman -Syu
```

3. Install the tool chain and useful tools:

```
pacman -S --needed base-devel mingw-w64-ucrt-x86_64-toolchain
```

4. Verify

```
g++ --version
gdb –version
which g++
# the output should be /ucrt64/bin/g++
```
Close the terminal

5. Add MSYS2 to the path

- Click the start menu and start typing the words "environment variables". Click the first suggestion
- System properties window will open up, click the button "Environment Variables"
- Under "User variables, click "Path" from the list and click "Edit…".
- Click "New", then copy-paste the path "C:\msys64\ucrt64\bin"
- Click "OK", then "OK" again, and then a final "OK" to close all windows.

2) Install VS Code and extensions

1. Install Visual Studio Code (stable).

2. Launch VS Code, go to extensions, and install the following:

- C/C++ (Microsoft) – IntelliSense and debugging
- Code Runner

3) Run and compile a hello world program

- Create a folder named "hello"

- Create a new file, name it "hello.cpp", save it in the "hello" folder

- Write a basic hello world program

```cpp
#include <iostream>

int main ()
{
    std::cout << "hello world" << std::endl;
}
```

- In the top-right corner, there is a play button. Click the down arrow next to the play button to get a list of options. Select "Run C/C++ File"

- In the menu that opens up in the top bar, select "C/C++: g++.exe…." from the C:\msys64\ucrt64\bin folder.

- In the bottom part of the IDE, open the terminal. If all configuration is okay, "hello world" will be displayed.