1. **Code formating**
   * Download LLVM: <https://github.com/llvm/llvm-project/releases/download/llvmorg-19.1.0/LLVM-19.1.0-win64.exe> and install.
   * Add ClangFormat binary to PATH
   * Make sure ClangFormat is added to environment, open cmd: **clang-format --version**
   * Create a **.clang-format** file in your project root (or Solution Root) or C:\Users\[UserName] with:

**clang-format -style=llvm -dump-config > .clang-format**

(Make sure .clang-format file is saved with Encoding: UTF-8)

Style:

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AI-generated content may be incorrect.

* + How to use Clang-Format?
    - Method 1: Using Clang-Format Extension (Recommended)

I tried Microsoft Visual Studio 2013, 2015 but It’s can’t.

With Microsoft Visual Studio 2019:

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* + - Method 2: Using Clang-Format as an External Tool
    - I do this method with: Microsoft Visual Studio 2013
    - Install Clang-Format: …
    - Put .clang-format file at Project Root or Solution Root or Home directory (order using: Project Root 🡪 Solution Root 🡪 C:\Users\[UserName])
    - Add Clang-Format to external Tools
      * Tool 🡪 External Tools
      * Click **Add** and configure it as follows:
        + **Title**: Clang-Format
        + **Command**: C:\Program Files\LLVM\bin\clang-format.exe
        + **Arguments**: -style=file -i "$(ItemPath)"
        + **Initial Directory**: $(ItemDir)

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🡪 Tick ‘Use Output Window’ to display error at Output window when run clang-format external tool.

* + - * Click **OK**
      * Apply Clang-Format
        + Open a source file and **run Clang-Format** from **Tools → Clang-Format**
        + You can also assign a **shortcut** to this external command in **Tools → Options → Keyboard**
        + Note: If you see error: .clang-format:1:4: error: Got empty plain scalar (at Output Window when run clang-format command). Please convert Encoding of .clang-format file to UTF-8.
    - Method 3: Auto-Format with a Pre-Commit Hook (check source code is apply format or not before commit)

We can do this one by Git, and SVN. I will do sample with SVN

Idea: - Create a file pre-commit at hooks directory (SVN server)

* Add scripts to check formatting with clang-format command.
* Place a .clang-format file in the root of your SVN repository to define the formatting style.
* When commit a locally file C/C++, if the file doesn’t match the .clang-format style, the commit will fail with an error message: …
* Do format at client and commit again.

1. **Static analysis**

Recommendation for Visual Studio C++

Setup:

* Open your C++ project in Visual Studio (2019 or later).
* Right-click project > Properties.
* Set C/C++ > Code Generation > Enable AddressSanitizer to Yes.
* Build (Ctrl+Shift+B) and run in Debug mode (F5).
* Check the Output window for errors like:

*AddressSanitizer: heap-buffer-overflow on address 0x...*