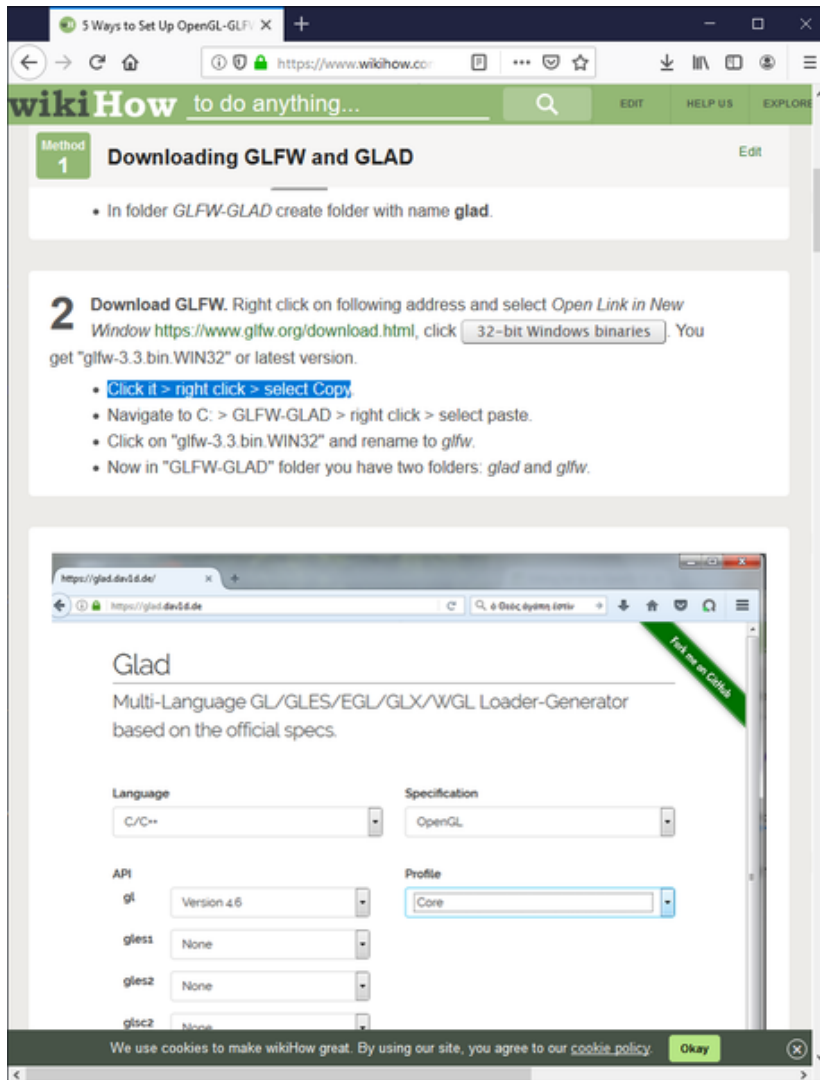


How to Set Up OpenGL?GLFW?GLAD on a Project with Visual Studio

Many programmers prefer OpenGL for graphics. If you are one of them, you are strongly advised by its producer to use a window toolkit (such as GLFW) and an OpenGL loading libraries (such as GLAD). This guide will help you get over the...

Method 1 of 7:

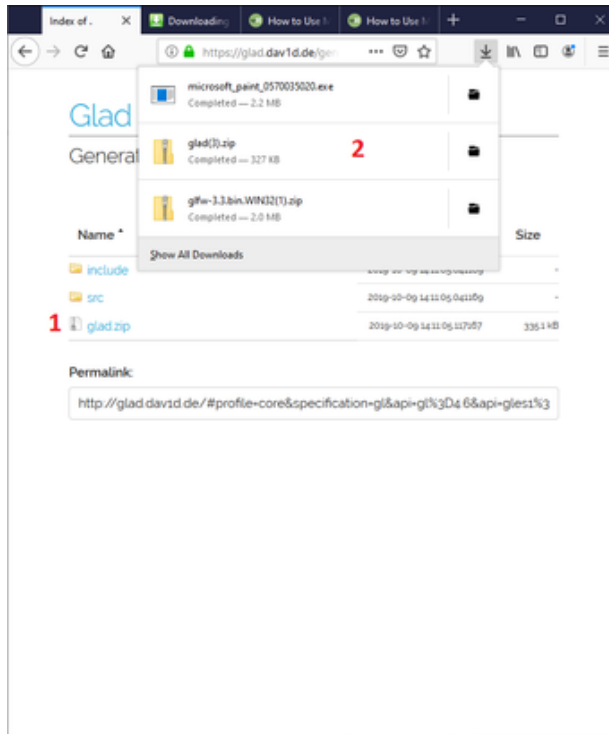
Downloading GLFW and GLAD



1.

Highlight what you expect to do. For example see picture above.

2. **Create folder GL.** In directory (disk) C:, right click > select **New** > **Folder** > type **GL** > hit **Enter**.
 1. In folder *GL* create folder with name **glad**.
3. **Download GLFW.** Right click on following address and select *Open Link in New Window* <https://www GLFW.org/download.html>, click **32-bit Windows binaries**. You get "glfw-3.3.bin.WIN32" or latest version.
 1. Click it > right click > select **Copy**.
 2. Navigate to C: > GL > right click > select **paste**.
 3. Click on "glfw-3.3.bin.WIN32" and rename to *glfw*.
 4. Now in "GL" folder you have two folders: *glad* and *glfw*.



4.

Download GLAD. Right click on following address and select *Open Link in New Window* <https://glad.dav1d.de/>. In **Language** leave *C/C++*. In **API/gl** entry, select the latest version (today is 4.6). In **Specification** leave *OpenGL*. In **Profile** select *Core*. Scroll down the page and click **GENERATE**.

1. In the "Glad" window, click "glad.zip", (see picture above).
2. After download, in downloading window you have two zip folders: *include* and *src*.
3. Click folder *include* > right click > **Copy**.
 1. Navigate to C: > GL > glad. In *glad* folder right click > select **Paste**.
4. (Alternatively click folder *include* and drag into folder *glad*, at C:GLglad).
5. Go back to downloading window > click folder *src* > right click > **Copy**.
 1. Navigate to C: > GL > glad. In *glad* folder right click > select **Paste**.
6. (Alternatively click folder *src* and drag into folder *glad*, at C:GLglad).
7. Now in folder *glad* you have two (unzipped) folders: *include* and *src*.

Method 2 of 7:

Creating a Visual Studio Project

1. Create an empty project.

1. With Visual Studio 2017

1. In V.S. main menu, click *File*. Then go to *New > Project...*
2. In the left part of the new project window, click *Visual C++* if it is not clicked.
3. In the center of the screen click *Empty Project*.
4. Below that, find the *Name* text box, type *Project-0*.
5. Next to *Location* text box, click *Browse...* and navigate to *C: > GL*. *Folder's* name should be **GL**.
6. Click *Select a folder*. The *Location* in *New Project* window is *C:GL*.
7. Make sure the *Create directory for solution* box is not checked.
8. Click .

2. With Visual Studio 2019

1. **If it's not opened.** Open it > Click > > .
2. In "Project name" text field type: **Project-0**. Next to "Location" text field click .
3. Navigate to *C: > GL*. *Folder's* name should be *GL*. Click . Now "Location" is **C:GL**.
4. Check "Place solution and project in the same directory" > click .
5. Wait till *Visual Studio 2019* instance appears.
6. **If it's opened.** Click *File > New > Project...* > > . The rest as above.

2. Add your source file to the Project.

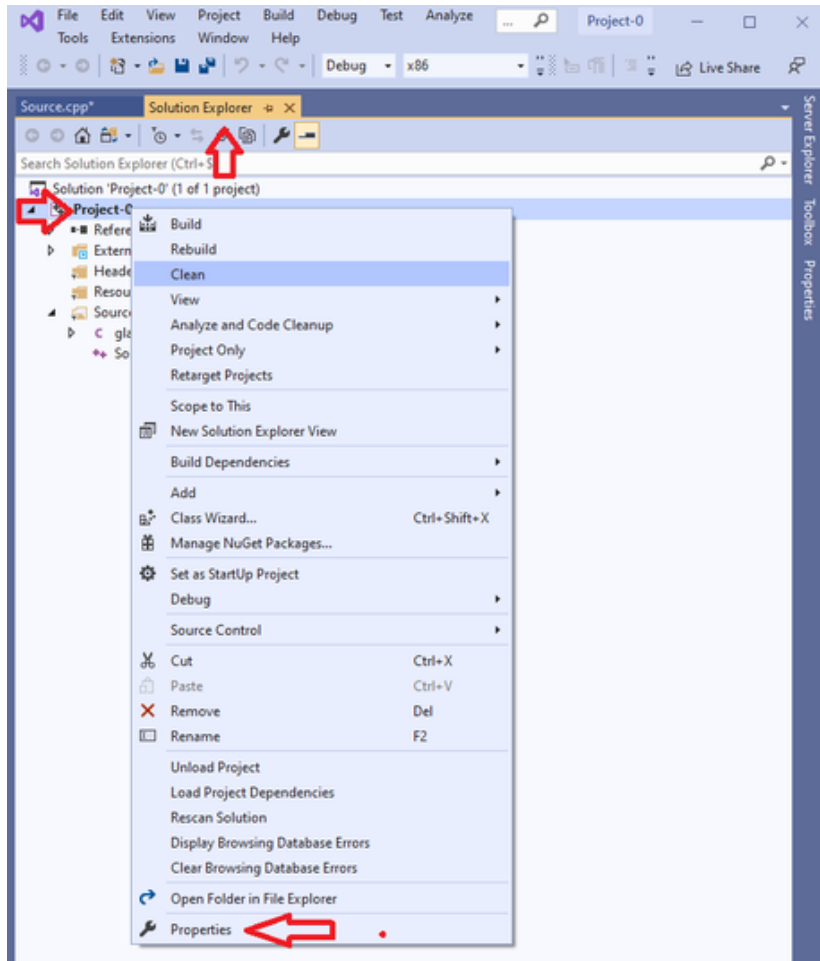
1. In the "Solution Explorer" window, right click the *Source Files* entry (the last one).
2. Click *Add > New Item...* In the *Add New Item - Project-0* wizard, click *C++ File (.cpp)* (the first one) from the middle of the window. In the *Name* text box leave *Source.cpp*.
3. The *Location* is *C:GLProject-0*.
4. Click the button. The file will open in the main text editor but leave the file blank for now.

Method 3 of 7:

Installing GLFW and GLAD in the Project

1. Add file *glad.c*. Go to Visual Studio > Solution Explorer > right click *Source Files* > click *Add > Existing Item ...*

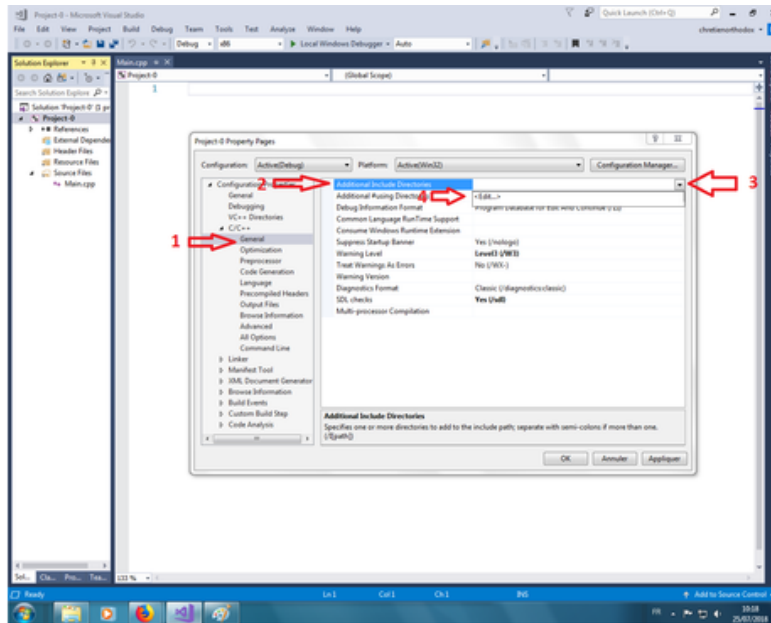
1. Navigate to *C: > GL > glad > src > glad.c* > click *glad.c*. "File name" should be *glad.c*. Click .



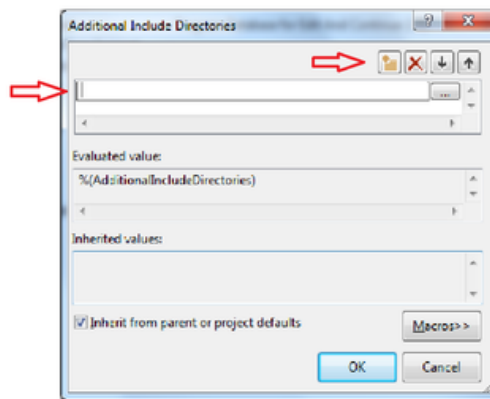
2.

Configure *Project-0* Property Pages. In *Solution Explorer*, right click on the name of your project, that is *Project-0*, and select *Properties*. Select *Configuration:* , *Platform:* .

1. **(1) Additional Include Directories.** Open C/C++ drop-down menu. Click *General > Additional Include Directories.* > the down arrow at the right of the field > click in the drop down menu.



1. Copy **C:GLglfwinclude** > in *Additional Include Directories* wizard click first icon > paste.



2. Copy **C:GLgladinclude** > in *Additional Include Directories* wizard click first icon > paste.
3. On *Additional Include Directories* wizard click .
2. **(2) Additional Library Directories.** Open the Linker drop-down menu, and click *General*. Click *Additional Library Directories* entry > down arrow at the right of the field > click in the drop-down menu.
 1. In "Additional Library Directories" wizard click first icon > .
 2. Navigate to C: > GL > glfw > lib-vc2019 or the latest. In the "Select Directory" window, the "Folder" should be "lib-vc2019" or the latest. Click .
 3. In "Additional Library Directories," click .
3. **(3) Additional Dependencies.** In Linker drop down menu click "Input". Click *Additional Dependencies* entry > the down arrow at the right of the field > in the drop-down menu.
 1. Copy **opengl32.lib; glfw3.lib; glfw3dll.lib** and paste on the top-most text box of the *Additional Dependencies* wizard. Click in the *Additional Dependencies* wizard.

4. **(4) Set Linker "SubSystem" to "Console"**. In the *Linker* drop-down menu, click *System* > *SubSystem* > click the down arrow at the end of the field > select *Console(/SUBSYSTEM:CONSOLE)* from the dropdown menu > click , then on the *Project Property Pages* wizard.
3. **Test your project.** Right click on following address and select *Open Link in New Window*
https://learnopengl.com/code_viewer_gh.php?code=src/1.getting_started/2.1.hello_triangle/hello_triangle.cpp
 Copy the code. Go to Visual Studio and paste in Source.cpp code area > hit **Ctrl+F5**, and wait... Two windows should appear: One black and other with name "LearnOpenGL" and inside an orange triangle.
 1. If only the black window (the console) appears with message: "Failed to create GLFW window", set up is okay, function `glfwCreateWindow` did not work.
4. **Correct any errors.** In "Error List" if you see error about
 1. file with extension `.h` go to part (Method) 3, step 1, "Configure the "Additional Include Directories"" and follow instructions.
 2. file with extension `.lib` go to part (Method) 3, step 2, "Configure the linker "Additional Library Directories"", and follow instructions. Also to step 3, "Configure the linker "Additional Library Directories"".
 3. "entry point must be defined" go to step 4, Set linker "SubSystem" to "CONSOLE" and follow instructions.
 4. file `glad.c` go to step 5, and follow instructions.
 5. For other errors, if you cannot correct them, close Visual Studio > delete project folder *Project-0* which lives in C:GL > open Visual Studio > repeat set up from part **Method 2**. Good job.

Method 4 of 7:

Creating a Project with an OpenGL-GLFW-GLAD Template

1. **Create Template.** Go to Visual Studio main menu and, **while *Project-0* is open**, click *Project* > *Export Template*.... On *Export template Wizard* check *Project Template*, if it's not checked. Click . On *Select Template Options*, in *Template name* text box type: *OpenGL-GLFW-GLAD*. Click . The Template has been created.
2. **Create Project.**
 1. **With V.S. 2017.** Click *File* > *New* > *Project*....
 1. On the *New Project* window, click template: *OpenGL-GLFW-GLAD*.
 2. In *Name* text field, type: *Project-1*.
 3. *Location* should be C:GL. If it's not, click > navigate C:GL > *Folder's name* should be *GL* > click .
 4. Be sure *Create directory for solution* is unchecked. Click .
 2. **With V.S. 2019.** Click *File* > *New* > *Project*....
 1. In **Create a new project** wizard scroll down the list of templates and select *OpenGL-GLFW-GLAD* > click .
 2. In **Configure your new project** wizard, in "Project name" text field type *Project-1*.
 3. *Location* should be C:GL. If it's not, click > navigate C:GL > *Folder's name* should be *GL* > click .
 4. Be sure *Place solution and project in the same directory* is checked. Click .
3. Type or paste a new code in Source.cpp. Run the program. Good job.

Method 5 of 7:

Creating Project to target x64 Platform

1. **Download GLFW.** Right click on following address and select *Open Link in New Window* <https://www.glfw.org/download.html>, click . You get "glfw-3.3.bin.WIN64" or latest version. The rest as above but with following step.
2. **Project's *Property Pages* main settings.** Go to "Solution Explorer" > right click on the name of your project > select "Properties". In *Platform:* entry, choose *x64* > Click
 1. In *Active solution platform:* select *x64*
 2. In *Platform* entry, *x64* is automatically selected.
 3. Click
 4. Tip: Even if in *Property Pages* main settings it is *Platform:* , click and in *Active solution platform:* select *x64*.
3. **Create template.** As above.
 1. TIP: In every project you create with it, select *x64* (next to *Debug*) in Visual Studio's GUI.

Method 6 of 7:

Setting up GLFW built by CMake, and GLAD

1. **Build GLFW by CMake and Visual Studio, and set up in project.** Right click on following link and select *Open Link in New Window* Use CMake to Get Binaries from Source Code. Follow it, but ...
 1. Before Method 3 (**Testing Binaries**), download GLAD according to present article's Method 1, step 4.
 2. In Method 3 (**Testing Binaries**), after step 2, add *glad.c* file: Go to Visual Studio > Solution Explorer > right click *Source Files* > click *Add* > *Existing Item ...*
 1. Navigate to C: > GL > glad > src > glad.c > click *glad.c*. "File name" should be *glad.c*. Click .
 2. In *Solution Explorer*, below *Source Files* you should see two files: *glad.c* and *Main.cpp*.
 3. In same Method (3), in step 3 **Configure project's Properties**, sub-step (2) **Additional Include Directories**, after configuring C:GLglfwinclude, copy **C:GLgladinclude** and, in *Additional Include Directories* wizard, click first icon > paste > click .
 4. **Test your project and correct errors if any.** In present article follow Method 3, steps 3 and 4.
2. **Create template.** As above.
 1. TIP: In every project you create with it, select *x64* (next to *Debug*) in Visual Studio's GUI.

Method 7 of 7:

Choosing Set Up

1. **In this tutorial you learn 3 was to set up GLFW and GLAD in Project with Visual Studio.**
 1. **Set up binaries x86 (32 bits).** It's the easiest. You should *start* learning set up from here.
 2. **Set up binaries x64 (64 bits).** It targets *x64* platform. Choose it *only* when you have specific reason for doing so.
 3. **Compile GLFW source, and set up, together with GLAD, in project.** Targets *x64* too. The most difficult. The *best* though.

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