COP 3014: Fall 2021 A Guide to Using CLion

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1 CLion

CLion is a comprehensive C++ Integrated Development Environment (IDE) developed and maintained by JetBrains. It is very intuitive and easy to use. For this class, we will use CLion for all of our work.

1.1 Applying for a Student License

In order to use CLion, you need to apply for a license. Go to https://www.jetbrains.com. From the menu on the top of the screen, choose Learning Tools and then Free Licenses for Students and Teachers. You should see the following screen:



Figure 1: JetBrains Academic Licences

Choose the tab that says "For Students and Teachers", scroll down and click on the blue "Apply Now" button. You will now see a form to apply for a Student License, as shown below. Please fill out the form and use your FSU email ID.

	the set of a set of a set of a set of the se	and the set of the second	tion Tourse and I	-
erore you app	ny, please read the <u>Edu</u>	<u>icational Subscrip</u>	ition Terms and I	<u>-AQ</u> .
Apply with:	UNIVERSITY EMAIL ADDRESS	ISIC/ITIC MEMBERSHIP	OFFICIAL DOCUMENT	GITHUB
Status:	 I'm a student I'm a teacher 			
Level of study:	Undergraduate		*	
	Is Computer Science or Enginee Yes No	ering your major field of stu	dy?	
Graduation date:	Choose Choose expected graduation date.			
Email address:	University email address, e.g.	js@mit.edu		
	l certify that the university email addre and belongs to me.	ss provided above is valid		
Name:	First name	Last name		
	Your name as it appears in your passp documents.	ort, driver's license, or other legal		

Figure 2: JetBrains Academic Licences

Click on "Apply Now".

You will get an email from JetBrains in a few minutes, asking you to confirm the request for a student license.

Once you confirm the request, they will send you another email, asking you to create a JetBrains Student Account. This takes about 5 minutes. Once you create the account, you should see a page with your Key.

2 Installing CLion

You can now download and install CLion. Download CLion from https://www.jetbrains.com/ clion/download. The page will automatically show you the right installer for your Operating System. Download the installer.

2.1 For Macs/Linux Machines

If you have a Mac or a Linux Machine, you already have a lot of the prerequisite programs needed for CLion. All you need to do is a couple of simple steps.

2.1.1 Mac OSX

Once you have downloaded the dmg file, use Finder to open the Applications folder. Move the file you just downloaded from the Downloads folder into the Applications folder. You're all set. Move on to Section 3.

2.1.2 Linux Machines

Download the tar from the website. Unpack it and then navigate to the **bin** directory and run **CLion.sh**. Once this is done, move on to Section 3.

2.2 For Windows Machines

Download the installer from the website and run it. It will start up the installation wizard.



Figure 3: Installation Wizard

It will now ask you to activate your CLion License. Put in the Username and Password for the JetBrains account you created. Click on Activate

CLion License Activation	- 🗆 X
●Activate ○Evaluate for free	Buy CLion
Activate license with:	
IetBrains Account Octivation code	○ License server
Username or email:	
Password:	Forgot?
	Activate Exit

Figure 4: Activate your license

Click on Next. It will ask you to choose a location to install CLion. Go with the default option.

CLion Setup					-		×
	Choose	Install L	ocation				
CL	Choose th	ne folder	in which to in	stall CLion			
Setup will install CLio select another folder.	n in the following t Click Next to conti	folder. To inue.	o install in a di	fferent fol	der, click	: Browse a	ind
Destination Folder							
Destination Folder	JetBrains\CLion 20)19.2.1			Bro	wse	
Destination Folder	JetBrains\CLion 20	019.2.1			Bro	wse	
Destination Folder C:\Program Files Space required: 1.2 G Space available: 57.9	JetBrains\CLion 20 iB GB	019.2.1			Bro	wse	
Destination Folder C\\Program Files Space required: 1.2 C Space available: 57.9	JetBrains\CLion 20 B GB)19.2.1			Bro	wse	

Figure 5: Installation Location

Click on Next. It will ask you to choose file associations. Check all the boxes.

CL		Configure yo	options our CLion in	nstallation			
Create Deskto	op Shortcut ncher			Update PATH	variable (rest hers dir to th	art needeo e PATH	ł)
Update conte	xt menu n Folder as Proj	ect"					
Create Associ	ations].h 🗹.C	⊡.cpp	.co	: v .hpp	.hxx		

Figure 6: Choosing File Associations

Click on Next. It will ask you to choose a Start Menu Folder. Go with the Default option, which is "JetBrains". This will create an entry for JetBrains and then CLion on the Windows Start Menu.

	Choos	e Start Me	nu Folder			
	Choose	a Start Me	nu folder for t	he CLion shortcu	its.	
Select the Start Menu also enter a name to	i folder in which	you would	like to create f	the program's sh	ortcuts. You	Ca
iso enter a name to	create a new ro	ider.				
JetBrains						
7-Zip						
Accessibility						
Accessories						
Administrative Tools						
Maintenance						
Microsoft Office 2016	Tools					
Microsoft Office Tools	s					
Notepad++						
Oracle VM VirtualBox	(
StartUp						
System Tools						
Tectia Client						
Mindows PowerShell						
			< Back	Install	Can	col

Figure 7: Choosing File Associations

Now click on Install. This will complete the setup. It will ask if you want to run CLion. Say Yes.

3 Running CLion for the first time

Once you have installed CLion, you can run it. There is a bit of setup to do when we run CLion for the very first time. This is mostly the same on all platforms. For Windows, there is an extra setup to get a Unix based C++ compiler installed, but the CLion Wizard will guide you through it.

When we first run CLion, it will ask if we would like to import settings. You will see the following dialog box.

😫 Import CLion Setti	ngs From	\times
O Previous version	C:\Users\shara\CLionProjects\config	\sim
O Config or installat	ion folder:	
Do not import set	tings	_
	UK	

Figure 8: Importing Setting

Choose "Do Not Import Settings". Click OK. It will ask you to accept the User Agreement. Read through the user agreement, if you desire to do so, and then check the box confirming that you Agree. Click on "Continue".

It will ask if you would like to send usage statistics to JetBrains. Choose whichever option (Send/Don't Send) that you are comfortable with.

It will ask you to choose a theme. Pick one that you like.



Figure 9: Choose a Theme

Click on Next: Toolchains. This is where the paths diverge for Mac and Windows machines.

3.1 For Macs / Linux Machines

Macs and Linux Machines most likely already have working installations of the C++ compiler, the make utility and a version of the GDB debugger. CLion should be able to automatically detect these. You should see a screen that looks like this, with different numbers next to CMake and GDB:

😣 🗉 Settings	
(Build, Execution, Deployment > Toolchains
Appearance & Behavior Menus and Toolbars	CMake executable:
System Settings	O Bundled CMake 3.8.2
File Colors	O Gurtam
Scopes 🐚	
Notifications	
Quick Lists	Debugger:
Path Variables	O Bundled GDB 7.11.1
Keymap	
▶ Editor	O Custom GDB:
Plugins	
Version Control	O Bundled LLDB 3.9.0
Build, Execution, Deployment	
Toolchains	✓ CMake: 3.8.2
CMake 🛯	∨ make: /usr/bin/make
Debugger	∨ C Compiler: /usr/bin/cc
Python Debugger 🛛 🖻	✓ C++ Compiler: /usr/bin/c++
Python Interpreter 🛛 🖻	∨ GDB: 7.11.1
Deployment	
► Console 🗠	
Languages & Frameworks	
Tools	
	OK Cancel Apply Help

Figure 10: Toolchains

Click on OK. Your setup is now complete.

3.2 For Windows Machines

Windows machines do not come with an installation of the required programs, so you should see a screen that looks like this:

Customize CLion		
UI Themes → Toolchains → Defaul	plugins → Featured plugins	
Configure Toolchains		
+ - 🗈 🕈 🔸		
	No toolchains configured	
No toolchains	You can add MinGW or Cygwin toolchain	
Toolchains can be changed later in	ettings Build, Execution, Deployment Toolchains	

Figure 11: Toolchains

Click on the link that says CygWin. You should now see this:

+	Name:	Cygwin	
	Environment:		· · · · · ·
		Not specified	Download
	CMake:	Bundled	· ·
		Does not work in this environment	
	Make:	Not found	· · · · · · ·
	C Compiler:	Not found	· · · · · ·
	C++ Compiler:	Not found	· · · ·
	Debugger:	Cygwin GD8 (\bin\gdb.exe)	•
		Not found, please install this package	

Figure 12: Toolchains

Click on Download. It will open the following screen on your web browser.

Cygnin Installation	× +			-	σ	×
< → C Q	yyyvik com/os/ablest	$\hat{\mathbf{x}}$	• •	*	≈ ¢	ð 1.
Cygwin Iantal Cygwin Updete Cygwin Saarch Packages Uccessing Terms Cygwin X						ĺ
Community Reporting Problems Mailing Linis Neuroprops	Installing and Updating Cygwin Packages					
IFIC channels Grid Dans	Installing and Updating Cygwin for 64-bit versions of Windows					- 8
Minor Sites Denations	Fina array-2016 64 cm any time you want to update or install a Cygwin package for 64-bit windows. The generation for array-2016 64 cm he used to verify the validity of this binary.					
Occurrentation FAO	Installing and Updating Cygwin for 32-bit versions of Windows					- 1
User's Oulde API Reference	Run actionable may time you want to update or install a Cygwin package for 32-bit windows. The augusture for actionable may can be used to verify the validity of this binary.					- 1
Arrayes	Signing key transition					- 1
Snapshots	The key used to sign setup binaries has been updated. During the transition period, signatures are made using both old (676941BA) and new (1A694DE962E56900) public keys here.					- 1
Cygein Peckages	See this mail for more details.					- 1
Related Sites	General installation notes					- 1
	When investing packages for the first time, the setup program does not sumily every packages. Duly the minimal base packages from the Cygrein distribution are installed by default, which takes up about 100 MII.					
	Clicking on categories and packages in the sense program package installation screen allows you to select what is installed or updated.					
	Individual packages lake losis, goc. loss. etc. are released independently of the Cyppin DLL, so the Cyppin DLL version is not useful as a general Cyppin release number. The setup program tooks the versions of all installed comp and provides the mechanism for installing or updating everything venilable from this use for Cyppin.	eecchs				
	Once you're installed your desined subset of the Cygoria distribution, the setup program will remember what you selected, so re-transing it will update your system with any new package missees.					
	On Windows Vista and later, the setup program will thesh by default if it man with administrative perviceges and, if not, will try to elevate the process. If you want to avoid this behaviour and install under an apprintigged account juy over own mange, run wetup with theex-a-fact option.	a fer				

Figure 13: CygWin Download Page

click on "setup-x86-64.exe". This will download the installer. Run the installer. This might require Admin privileges.



Figure 14: Installing CygWin - Launch Installer

• It will ask you for installation options. Choose "Install from the Internet". Then click on Next.

Cygwin Setup - Choose Installation Type	-		>
Choose A Download Source Choose whether to install or download from the internet, or install from files in a local directory.		(
Install from Internet (downloaded files will be kept for future re-use)			
O Download Without Installing			
O Install from Local Directory			

Figure 15: Installing CygWin - Install from the Internet

• It will ask you to choose a directory for installation. Go with the default option (something like C:\CygWin64). It will also ask you to choose users. Choose "All Uses". Click on Next

Cygwin Setup - Choose Installation Directory	-		:
Select Root Install Directory Select the directory where you want to install Cygwin. Also choose a few installation parameters.		ĺ	
Root Directory			
C:\cygwin64		Browse	
Install For			
All Users (RECOMMENDED)			
Cygwin will be available to all users of the system.			
🔾 Just Me			
Cygwin will still be available to all users, but Desktop Icons, Cygwin Menu E Installer information are only available to the current user. Only select this if privileges or if you have specific needs.	ntries, and im you lack Adm	portant ninistrator	

Figure 16: Installing CygWin - Install for All Users

- It will ask you where to store the Downloaded files. Go with the default option (most likely your Downloads folder). Click on Next.
- On the next screen, choose "Use System Proxy Settings". Click on Next.

Cygwin Setup - Select Connection Type Select Your Internet Connection Setup needs to know how you want it to connect to the internet. Choose the appropriate settings below.	-		
Use System Proxy Settings Use HTTP/FTP Proxy: Proxy Host Port 80			
< Back N	ext>	Can	cel

Figure 17: Installing CygWin - Proxy Settings

• The next screen will show you a list of "mirrors". You can pick any of them. Click on Next.

hoose A Dow Choose a si	vnload Site ite from this list, or add your own sites to the list			1	>
	Available Download Sites:				
	http://mirrors.koehn.com	^			
	http://mirrors.metapeer.com				
	ttp://cygwin.mirrors.pair.com				
	https://www.singleboersen.com				
	http://mirror.team-cymru.com				
	ftp://mirrors.xmission.com				
	http://mirrors.xmission.com				
	http://mirror.clarkson.edu				
	http://www.atlib.gatech.edu				
	https://mirrors.rit.edu				
	ftp://mirror.cs.vt.edu	~			
	htte://minar.ea.ut.a.du				
User URL:			Add		

Figure 18: Installing CygWin - Choose a Mirror

It will ask you to choose which packages to install. To keep things simple, we're going to install the 6 required packages for C++. You should be seeing the following screen.

Select packages to install							l
ew Pending V Search	Clear		(Kee		Best O Sync	Ter
Package	Current	New		Bn?	Sec?	Categories	
Geo IP database	20171111-1	20180505-1		2		Net	24
GraphicsMagick	1.3.278-1	1.3.33-1	*		П.	Graphics	
GraphicsMagick-debuginfo	1.3.278-1	1.3.33-1			n.	Debug	
image/Magick	6.9.9.11-3	6.9.10.11-1	-	v	Π.	Graphics	
ImageMagick-debuginfo	6.9.9.11-3	6.9.10.11-1	*	~	Π.	Debug	
inageMagick-doc	6.9.9.11-3	6.9.10.11-1	*	2		Graphics	4
R	3.4.3-1	36.0-1		v	Π.	Math, Science	- 40
R debuginfo	3.4.3-1	3.6.0-1	*	~		Debug	
TeXmaos	1.99.2-1	1.99.9-1	*	2		Editors	25
TeXmacs-debuginfo	1.99.2-1	1.99.9-1		2	0	Debug	30
WindowMaker	0.95.8-1	0.95.8-2	-	2		X11	
Window Maker debuginfo	0.95.8-1	0.95.8-2	*			Debug	
abiword	3.0.2-2	3023				Editors, Publishing	
abiword-debuginfo	3.0.2-2	3.0.2-3	-	I		Debug	21
abiword plugins	3.0.2-2	3.0.2-3	*	2		Editors, Publishing	
adwata-icon-theme	3.24.0-1	3.26.1-1		Image: A start a st		GNOME	12
adviate-icon-theme-devel	3.24.0-1	3.26.1-1	-	I		GNOME	
akonadi	1.13.05	17.12.3-1	*	✓		KDE	
akonadi-debuginfo	1.13.0-5	17.12.3-1	-	2	Π.	Debug	- 31
							>

Figure 19: Installing CygWin - Packages

- Go to the Drop-down box on the top left (which probably says "Pending") and choose "Full".
- Search for gcc-core. You will see the following screen. Click on the drop down box on the line for gcc-core:. Choose a number like 9.3. Sometimes, you might get multiple version numbers. Pick the latest (largest) version number that doesn't say "Test".

electPackages								-	
Select packages to install w Full	Cle	ər				⊖Keep (Best	OSync	Test
Package	Current	New		Src?	Categories	Size	Descriptio	on	
:ygwin32-gcc-core		Skip	-		Devel	16,464k	GCC for C	ygwin 32bit	toolchain (C
djgpp-gcc-core		Skip	-		Devel	7,926k	GCC for D	JGPP toolc	hain (C)
gcc-core		9.3.0-2	-	\checkmark	Devel	89,384k	GNU Con	npiler Collec	tion (C, Ope
ningw64-i686-gcc-core		Skip	-		Devel	16,851k	GCC for V	Vin32 (i686-v	v64-mingw3
ningw64-x86_64-gcc-core		Skip	-		Devel	17,464k	GCC for V	Vin64 toolch	ain (C, Oper
Hide obsolete packages									

Figure 20: Get gcc-core

• Clear the search bar. Search for gcc-g++. You will see the following screen. Click on the drop down box on the line for gcc-g++. Choose a number like 9.3. Sometimes, you might get multiple version numbers. Pick the latest (largest) version number that doesn't say "Test".

lect Packages Select packages to install									6	
w Full V Search 9++	Clea	ar				O Keep	Best 🔘	Sync	Tes	
ackage	Current	New		Src?	Categories	Size	Description			_
rgwin32-gcc-g++		Skip	-		Devel	10,456k	GCC for Cygw	in 32bit to	olchain (2+-
gpp-gcc-g++		Skip	•		Devel	8,279k	GCC for DJGF	P toolch	ain (C++)	
cc-g++		9.3.0-2	-	~	Devel	85,154k	GNU Compile	r Collecti	on (C++)	
ingw64-i686-gcc-g++		Skip	-		Devel	14,358k	GCC for Win32	2 (i686-w6	64-mingw3	32)
ingw64-x86_64-gcc-g++		Skip	-		Devel	14,781k	GCC for Win64	4 toolcha	in (C++)	
)
Hide obsolete packages										

Figure 21: Get gcc-g++

• Clear the search bar. Search for libgcc. You will see the following screen. Click on the drop down box on the line for libgcc1. Choose a number like 9.3. Sometimes, you might get multiple version numbers. Pick the latest (largest) version number.

Full	✓ Search	libgcc CI	ear				O Keep	Best OSync	Test
ackage		Curren	it New		Src?	Categories	Size	Description	
gcc1			9.3.0-2	•	✓	Libs	68,928k	GCC C runtime library	
igccpp1			8.0.4-1	•	\checkmark	Libs	1,138k	Boehm-Demers-Wei	ser garbag

Figure 22: Get libgcc

• Clear the search bar. Search for make. You will see the following screen. Click on the drop down box on the line for cmake. Choose a number like 3.14.

iew Full ~ Search make	Clear			ОКеер 🤅	Best OSync Test
Package	Current New	Src?	Categories	Size	Description
automake1.16	Skip		Devel	812k	(1.16) a tool for generating GNU-
automake1.4	Skip	▼ □	Devel	248k	(1.4) a tool for generating GNU-ce
automake1.5	Skip	▼ □	Devel	332k	(1.5) a tool for generating GNU-c
automake1.6	Skip	▼ □	Devel	365k	(1.6) a tool for generating GNU-c
automake1.7	Skip	▼ □ 1	Devel	426k	(1.7) a tool for generating GNU-c
automake1.8	Skip	▼ 1	Devel	499k	(1.8) a tool for generating GNU-c
automake1.9	Skip	▼ □ 1	Devel	557k	(1.9) a tool for generating GNU-ce
cmake	3.14.5-1	▼ ▼	Devel	13,392k	Cross-platform makefile generati
cmake-debuginfo	Skip	▼ □ 1	Debug	223,140k	Debug info for cmake
cmake-doc	Skip	▼ □ 1	Devel	1,351k	Cross-platform makefile generati
cmake-gui	Skip	▼ □ 1	Devel	1,502k	Cross-platform makefile generati
emacs-cmake	Skip	▼ □	Editors	4k	Cross-platform makefile generati
extra-cmake-modules	Skip	▼ □	Devel	281k	Extra CMake Modules for KDE
ncc-tools-enoch1-automake C	Skin		Devel	419k	(ncc-special) a tool for generatin

Figure 23: Get cmake

• Scroll down a little bit until you see make. Click on the drop down box on this line and choose a number like 4.3.1.

w Full V Search make	Clea	ar			⊖Keep (Best OSync Tes
ackage	Current	New	Si	c? Categories	Size	Description
cmakedep		Skip	-	Devel	6k	X Makefile dependency tool for
ake		Skip	-	Devel	35k	X Imake legacy build system
ake-debuginfo		Skip	-	Debug	64k	Debug info for imake
WMaker-devel		Skip	-	Libs	3k	Window Maker interface library
WMaker1		Skip	-	Libs	4k	Window Maker interface library
pagemaker-tools		Skip	-	Graphics	5k	MS Publisher file converters
pagemaker0.0-debuginfo		Skip	-	Debug	591k	Debug info for libpagemaker0.0
pagemaker0.0-devel		Skip	-	Libs	2k	Adobe PageMaker import filter
pagemaker0.0-doc		Skip		Libs	109k	Adobe PageMaker import filter
pagemaker0.0_0		Skip	▼	Libs	65k	Adobe PageMaker import filter
ake		4.3-1	-	Devel	1,743k	The GNU version of the 'make'
ake-debuginfo		Skip	•	Debug	441k	Debug info for make
akedepend		Skip	•	Devel	29k	X Makefile dependency tool
akedenend-dehurinfo		Skin		Debug	75k	Dehug info for makedenend

Figure 24: Get make

• Clear the search bar. Search for gdb. You will see the following screen. Click on the drop down box on the line for gdb. Choose a number like 8.3.1.

ew Full ~ Search 9db	Clear			O Keep	Best OSync Test
Package	Current New	Src?	Categories	Size	Description
:gdb	Skip	•	Devel	719k	A curses-based interface to the GN
gdb-debuginfo	Skip	•	Debug	334k	Debug info for cgdb
db	8.3.1-1	▼ ∨	Devel	23,080k	The GNU Debugger
jdb-debuginfo	Skip	▼	Debug	28,277k	Debug info for gdb
dbm	Skip	▼ □	Database	161k	GNU dbm implementation
dbm-debuginfo	Skip	-	Debug	289k	Debug info for gdbm
bgdbm-devel	Skip	▼ □	Libs	14k	GNU dbm implementation
bgdbm4	1.13-1	▼	Libs	20k	GNU dbm implementation
bgdbm6	Skip	•	Libs	22k	GNU dbm implementation
bgdbm_compat4	Skip	•	Libs	4k	GNU dbm implementation
ningw64-i686-gdbm	Skip	▼	Devel	56k	GNU dbm implementation for Win3
ningw64-x86_64-gdbm	Skip	-	Devel	57k	GNU dbm implementation for Wine

Figure 25: Get gdb

• Clear the search bar. Then click Next. You will see the following screen where CygWin will show you a list of dependencies. Just click Next. CygWin will now install the new packages we have specified. This should not take too long, only about 10 minutes. On the final screen of the CygWin installation wizard, click Finish.

The following packages are required to satisfy dependencies.		P
libboost_atomic1.64 (1.64.0-1)	^	
Boost C++ libraries		
Required by: libboost-devel		
libboost chrono1.64 (1.64.0-1)		
Boost C++ libraries		
Required by: libboost-devel, libboost_timer1.64		
libboost container164 (1640-1)		
Boost C++ libraries		
Required by libboost-devel		
<	, `	
Select required packages (RECOMMENDED)		

Figure 26: Dependencies

• Back in CLion, the software will now try and detect the new libraries. After about a minutes, it should have automatically detected all the libraries. Click OK.

+ - I A V	Name:	Cygwin (1)	
Cygwin (1)	Environment:	C:\cygwin64	.
		Version: 3.1.5	Down
	CMake:	Bundled	•
		✓ Version: 3.16.5	
	Make:	Detected: C:\cygwin64\bin\make.exe	•
	C Compiler:	Detected: C:\cygwin64\bin\gcc.exe	•
	C++ Compiler:	Detected: C:\cygwin64\bin\c++.exe	•
	Debugger:	Cygwin GDB (C:\cygwin64\bin\gdb.exe)	•
		Version: 8.3.1	

Figure 27: CLion detecting CygWin Libraries

CLion will now start up for the first time, and resolve all the external dependencies and symbols. This takes about 5 minutes. You are now good to go.

4 Creating a Project

In order to write and run a C++ program on CLion, you should first create a project. Open CLion and then choose File ->New Project.

File Edit View Navigate Code Refacto	Run Tools VCS Window Help
New Project	48 🕒 Project1 - 🕨 🗰 🔲 Q.
Import Project	
New Scratch File Ctrl+Alt+Shift+Inser	
<u>> Open</u>	
Open ORL	
Close Project	
9k Settings (triadita	
Default Settings	
Import Settings	
Export Settings	Search Everywhere Double Shift
Settings Repository	
3 Reload CMake Project	Go to File Ctrl+Shift+N
H Save All Ctrl+	Recent Files Ctrl+E
Synchronize Ctrl+Alt+	Naviation Par Altektore
Invalidate Caches / Restart	Havigatori bai Altri forne
管 Print	Drop files here to open
Power Save Mode	
Exit	
Create a new CMake Project	Context: «no context» 🛚 🚡 👥

Figure 28: Opening a New Project

You will now see a screen where it asks you to choose where to save the project. Also, the project is called "untitled" by default. Change it to a name of your preference, and if requires, a location that you can easily remember. By default, it is saved in a Folder called CLionProjects.

😣 🗉 New Project	
C++	Location: /home/sharanva/CLionProjects/Project2
🙏 C++ Executable	
🛕 C++ Library	Language <u>s</u> tandard: C++11 v
C	
🛕 C Executable	
🛕 C Library	
	8
	Create

Figure 29: New Project Name and Location

Click on Create. This will open a new project with a default program stub. This program is called "main.cpp". We will usually require to to give specific names to your programs. This requires you to refactor the project. Right Click on "main.cpp" in the Project Explorer Window on the left and choose Refactor ->Rename.

Project Q + Q - P A CMAkeLists.tt mmain.cpp · Improject2 -/CLIOPROjectS/Project2 -/CLIOPROjectS/Project3 -/CLIOPROject3	
Project2/CLIONProject2/Project2 #include #include #include A CMAKeListLat 3 int main() { std::cout < "Hello, World!" << std::ceut B mank=Outle 3 int main() { std::cout < "Hello, World!" << std::ceut B Externalt New , return 0; "Hello, World!" << std::ceut	
External Vew Vew Vew Vew Vew Vex Vex	
Ø Reload CMake Project ✓ Cut Carl+st ⑤ Copy Ctri+C Copy Pelative Path Ctri+Shift+C Copy Relative Path Ctri+Shift+C ⑦ Baste Ctri+Alt-Shift+C Pind Usages Alt+F7 Inspect Code Refactor Refactor Renamy Clean Python Compiled Files Change Signature Clean Bython Compiled Files Change Signature Local Hjistory Belete Files Extract Show in Files Ctri+Alt+Shift+2 File Path Ctri+Alt+Shift+2 Pull Members Down Pull Members Down	
X Cut Cut+X Copy Cut+At Copy Relative Path Cut+All-shift+C Copy Relative Path Cut+All-shift+C Image: Copy Relative Path Cut+All-shift+C Find Usages Alt+F7 Inspect Code Benamity Befactor Benamity Add to Favorites Move Delete Delete Cost Jistory Safe Delete File Cut+All-shift-2 File Sth Cut+All-shift-2 File Sth Cut+All-shift-2 Pull Members Down Pull Members Down	
Benant Shifter6 Befactor Benant Shifter6 Clean Python Compiled Files Change Signature Crit-Ro Add to Favorites Move F6 Delete Delete Copy F5 Softwirnize*main.cpp' Egtract Cri+Alt+Neite File Cri+Alt+Shift-2 Cri+Alt+Neite File Payl Members Up Put Members Down	
Clean Python Compiled Files Change Signature Ctrl+76 Add to Fayorites Move F6 Delete Delete CopP F5 Sofe Delete Alt+Delete Extract Inine Show in Files Inine Ctrl+Alt+N File Bath Ctrl+Alt+Shif+22 Pul Members Up * Compare With Ctrl+Alt	
Add to Fgyorites Move F6 Delete Delete Capy F5 Local History Safe Delete Alt-belete Ø Synchronize'main.cpp' Extract Itgline Show in Files Ctrl+Alt+shirt+2 Itgline File path Ctrl+Alt+shirt+2 Pull Members Up	
Delete Delete Copyn F5 Local History Safe Delete Alt+Delete Ø' Synchronize * main.cpp' Eatract L+ Show in Files Inivert Boolean Human File Bath Ctrl+Alt+shift-2 Univert Boolean * Compare With Ctrl+Alt Pull Members Up	
Local History Safe Delete Alt+Delete Ø Synchronize main.cpp' Extract Iteline Show in Files Iteline Ctrl+Alt+N File Bath Ctrl+Alt+Shift+2 Invert Boolean * Compare With Ctrl+Alt Publ Members Down	
Show in Files Igline Ctrl+Alt+N File Path ctrl+Alt+Shift+2 Pull Members Up * Compare With Ctrl+D Pulk Members Down	
Compare With Ctrl+D Pull Members Up Push Members Down	
Create Gist	

Figure 30: Renaming the file

In the following window, give the file its required name.

😣 🗈 Rename						
Rename file 'main.cpp' and its usages to:						
sample.cpp						
Search in <u>c</u> omments and strings						
Refactor Preview Cancel Help						

Figure 31: Renaming a file

Click on Refactor. You are now ready to start writing your program.

5 Running your program

Once you have completed writing your program, save your work by choosing File ->Save. Before running your program, you have to Build your project. This compiles your program and if your program is error free, it gets your program ready for execution. Choose Run ->Build. You should see something like the following screen:

			E Project2 - 🕨 🕷 🗉 🖸
Preject	0000-1- 40	Askelinta.tat - Gatemple.cop -	
 In registry 2 - (CLIONPE)estation In cranke-bitdedung A CMekkshitzet I. serejk-cpp Bit External Libraries 	40%sject2 1 2 3 3 4 5 5 7	Riccise Leaded Life termination of the second seco	nj Mi
Messages build /home/sharanya/Down Scarning dependencia I 50% Building CXX I 100% Built target	leads/clion-2017 ss of target Proj object (MskeFile secutable Project Project2	2.3/bin/cmake/bin/cmakebuild /home/sharanyu et2 s/Project2.dir/somple.cpp.o 12	o- n/CLieeProjects/Project2/cmake-bull6-debug →target Proje &

Figure 32: Building the Project

The console window on the bottom of your screen will show you the Build results. If your program

has errors, they will be listed there. If the program compiles fine, it will say "100% Built Target" followed by the Project name.

Once your project builds successfully, you can run it. Choose the project on the drop down list in the top right corner and then click on the green arrow button next to it. Your output will be displayed on the bottom of the screen in the console window.

Eile Edit View Navigate Code Refac	or Run Tools VCS Window Help	
Project2 🖓 🛲 sample.cpp 👌		4) 🔚 Project2 🖉 🕨 🗮 🔍
🗗 Project 😳 🌵 🏘	· I* 🛕 CMakeLists.txt × 🔮 sample.cpp ×	
 In englet2. →CLIAntProject20 B constabulid-debug A constabulits.tot Sample.cop III External Libraries 	<pre>int main() { sticute <istream> int main() { sticute <= "Wello, World!" >= std::endl; sticute <= "Wello, World!" >= std::endl; return 0; } </istream></pre>	v
Run 🖶 Project2		$\Phi \in \pm_{n}$
	ts/Project2/cmake-bulld-debug/Project2 β. β. t code θ	
Build finished in 52ms (moments ago)		7:2 LF: UTF-8: Context: Project2 [D] 🛛 🖶 🔾

Figure 33: Running the Project

6 Opening an Existing Project

To open an existing project choose File >Open. In the dialog box that pops up, navigate to the location where you saved the project. Click on the project name and then click OK.

😣 💷 Open File or Project
😭 😳 📭 🔀 🗙 灯 🂷 🛛 Hide path
/home/sharanya/CLionProjects/Project2
anaconda2
Android
android-studio
AndroidStudioProjects
Applications
Caitlin
Classes
CLionProjects
Project1
Project2
Desktop
Documents
Downloads
HERC
▶ ■ idea-IC-141.1532.4
urag and drop a rile into the space above to quickly locate it in the tree
OK Cancel Help

Figure 34: Running the Project

If you already have a project open, CLion will ask you if you would like to open this project in the same window or in a new window. You can choose either option.

7 Turning in your assignment

CLion would have created a folder where it places your projects by default. Alternatively, you might have specified a folder to put your project in when you created it. Navigate to the folder on Finder (Mac) or Folders (PC) and you will see a Folder for your Project. Opening that will show you all the source files under that project. The .cpp file is the file you need to turn in through Canvas

8 Troubleshooting

This section can be used for troubleshooting the most common errors you might encounter while installing CLion. If your problem persists after trying this, please contact your instructor/ TA for help.

8.1 On Windows

8.1.1 Issue with CLion not finding the CygWin Debugger

One likely issue with the CygWin installation is CLion being unable to locate the gdb.exe file for the Debugger. It will say "File Not Found", even if the file is manually located. This happens with a certain combination of Windows and CLion versions. To resolve this issue, please use the following steps.

- 1. Open CLion. Go to File ->Settings. Choose Build, Execution, Deployment. and then choose Toolchains.
- 2. Add a new Environment by clicking on the "+' button and then choosing "MinGW".

Settings						×
Q.		Execution, Deploym	nent > Toolchains			Rese
Appearance & Behavior Keyman		+ - 🖻 🔺 👻	Name	Cygwin		
 Editor Plugins 		Cygwin ✓ Visual Studio ▲ WSL	Environment:	C:\cygwin64 Version: 3.1.5	Downl	
 Version Control Build, Execution, Deploym 	ent	Remote Host	CMake:	Bundled	•	
Toolchains CMake			Make:	Version: 3.16.3 Detected: C:\cygwin64\bin\make.exe	•	
Compilation Database Custom Build Targets	8		C Compiler:	Detected: C:\cygwin64\bin\gcc.exe	v	
bradie ► Debugger						
Python Interpreter	9		Debugger:	Cygwin GDB (C:\cygwin64\bin\gdb.exe) Version: 8.3.1	*	
 Console 	9					
 Dynamic Analysis Tools Embedded Developmen 	t					
Required Plugins Languages & Frameworks	6					
▶ Tools						
?				OK	Арг	ply

Figure 35: Create a MinGW Environment

3. This will create a new Environment, and all the field will be empty again. Click on the Download link. This will open a page on your browser, shown below. Click on "Sourceforge".

(L	og in)
	(1

Figure 36: Download MinGW

4. This will open another webpage. It will start downloading the installer after 5 second. Open the installer after it was downloaded. You will see the following screen.

🚆 Installing MinGW	-W64 —		×
	Welcome to the MinGW-W64 Installation!		
\bigcirc	Welcome to the MinGW-W64 online installer.		
8			
MinGW-W64	Next >	Cano	el

Figure 37: MinGW Installer

5. Click "Next". This will show you the Settings. Under "Architecture", choose "x86_64". Click "Next".

🛃 Installing MinGW-W64			_		\times
Settings					
Specify setup settings.					0)
Version	8.1.0	~			
Architecture	x86_64	~ -			
Threads	posix	~			
Exception	seh	~			
Build revision	0	~			
MinGW-W64					
	< Back N	ext >		Cano	el

Figure 38: MinGW Installer

6. This will show you the location of the installation. You may change it if you wish to do so, but you may also leave it as-is. Click "Next".

- 7. This will install MinGW. Unlike CygWin, MinGW doesn't ask you to choose specific packages. So, this might take a while - up to 25 minutes.
- 8. Once the installation is complete, click "Next" and then click "Finish".
- 9. Go back to CLion. It still wouldn't recognize MinGW. Click "Cancel" and exit CLion.
- 10. Restart CLion. Repeat Steps 1 and 2 of these instructions. CLion will now recognize the MinGW environment and automatically find the required files, as shown below. Also, click on MinGW under the Environments box and click on the Up Arrow above it to make it the default Environment.

Settings	_				×
Q.	Build, Executive ployme	nt > Toolchains			Reset
► Appearance & Behavior	+ - 🖻 🔺 🔻	Name:	MinGW		
Keymap	Cygwin (default)				
▶ Editor	MinGW	Environment:	C:\Program Files\mingw-w64\x86_64-8.1.0-posix-seh-rt_v6-rev0\mingw64	-	
Plugins			Version: w64 6.0 Do	wnlo	ad
▶ Version Control			(n		
▼ Build, Execution, Deployment		Смаке:	Bundled	×	
			Version: 3.16.5		
CMake 🛛		Make:	Detected: C:\Program Files\mingw-w64\x86_64-8.1.0-posix-seh-rt_v6-rev0\mi	Ŧ	
Compilation Database		C Compiler:	Detected: C:\Program Files\mingw-w64\x86_64-8.1.0-posix-seh-rt_v6-rev0\mi	Ŧ	
Custom Build Targets 👘					
Gradle 🗎		C++ Compiler:	Detected: C:\Program Files\mingw-w64\x86_64-8.1.0-posix-seh-rt_v6-rev0\mi	*	
Debugger					
Python Debugger 🛛 🔞		Debuggen	MinGW-w64 GDB (C:\Program Files\mingw-w64\x86 64-8.1.0-posix-seh-rt v6-	Ŧ	
Python Interpreter 👘			Version: 81		
► Deployment					
► Console 🛛					
Coverage 👘					
Dynamic Analysis Tools					
Embedded Development					
Required Plugins 🛛 🕲					
Languages & Frameworks					
▶ Tools					
?			OK Cancel	Appl	у

Figure 39: CLion Toolchains

11. You can now resume at Step 4 on Page 13.

8.1.2 Other ways to Troubleshoot the issue above

There are also a few other workarounds for the issue above.

- 1. Install an older version and update: You can install an older version of CLion, which doesn't result in this issue, and then update CLion, retaining the older settings. Any version released in 2019 or Version 2020.1 would work. Older versions of CLion can be found at https://www.jetbrains.com/clion/download/other.html
- 2. Install CygWin first, and then install CLion. Uninstall CLion. Go through the steps to get the correct libraries on CygWin first. Then install CLion again. This time, it should be able to recognize all the files without issues.

8.1.3 Other issues on Windows

The other common issue on Windows is a glitch in the CygWin installation when a few critical dependency files are not downloaded. Please go through the following steps:

- 1. Open CLion. Go to File ->Settings. Choose **Build**, **Execution**, **Deployment**. and then choose **Toolchains**.
- 2. You will see "Download" link on the right. Click on the link.
- 3. Go through the steps for the CygWin installation again (the list below Figure 11), until you see the packages screen. However, this time, choose a different mirror.

- 4. Go to the Drop-down box on the top left, that says "Pending" and choose "Full".
- 5. Go through the process of installing the 7 libraries again, but this time, make sure you get version numbers that are higher than the ones you have installed. Otherwise, go back and choose a different mirror. Keep doing this until you see higher version numbers, and install the latest versions.
- 6. Restart CLion. The old project would have been opened under the old settings. Open a new project. You should now be able to run it without issues. The very first time you build a project with CLion, it will take a little time to index all the libraries. Please wait until the little arrow on the top right goes green before running.

8.2 On a Mac

CLion usually installs without trouble on a Mac. Some older versions of OSX might have issues due to the different versions of the C++ compiler. OSX does not allow you to directly update the Clang tools needed for this, but you can re-install the XCode developer tools, which will get all the updates you need indirectly. Please go through the following steps.

- 1. Open the Terminal.
- Re-install XCode developer tools by typing xcode-select --install and press Enter.
- Accept the XCode user license. On the terminal, type sudo xcodebuild -license Enter the admin password for the computer when prompted. Please not that you will not see the password being typed in. This is ok. Type in the password and press Enter.
- 4. The license will then be presented on screen. Hit the space bar to scroll through the text. When you get to the end of the text, you'll be prompted to enter "agree". Type this in and hit Enter.
- 5. Restart CLion, click on File ->Reload CMake Project and everything should work.