*1*

**Using** **GTKmm** **in** **the** **student** **environment**

*Note:* *you* **must** *test* *your* *graphical* *display* *on* *the* linux.student.cs.uwaterloo.ca*environment* *before* *the* *project* *is* *due.* *We* *recommend* *testing* *your* *program* *in* *MC* *3022* *as* *the* *marking* *demos* *will* *occur* *in* *this* *room.*

**1** **Accessing** **the** **student** **environment**

If you have never logged into a school computer, you will first have to set your password through https://www.student.cs.uwaterloo.ca/password/.

**1.1** **Computing** **Labs**

If you do not wish to install these programs on your personal computer, you can sshinto your linux.student.cs.uwaterloo.caaccount using Mac and Linux Labs in the MC.

To enable X11 forwarding, include the -Xand -Yflags in the sshcommand. You should also check your sshapplication’s settings to ensure that X11 forwarding is enabled.

Login using a terminal and the command: ssh -X -Y *userid*@linux.student.cs.uwaterloo.ca

**1.2** **Using** **Windows**

1. Install PuTTY, which is a free SSH client.

2. Login by entering ssh userid@linux.student.cs.uwaterloo.cainto the box labelled Host Name or IP address. (We recommend saving this as your default setting.) Press the Openbutton at the bottom right of the window. A terminal will open after requesting your password. **Note**: *no* *characters* *will* *appear* *while* *you* *are* *typing* *your* *password.*

**1.3** **Using** **Mac** **OS** **X**

1. Open a terminal using either Terminalor XQuartz(they can usually be found in the Utilities folder in your Applicationsfolder).

2. Type the command: ssh -X -Y *userid*@linux.student.cs.uwaterloo.ca. This will ask for your password. **Note**: *no* *characters* *will* *appear* *while* *you* *are* *typing* *your* *password.*

3. If you are using XQuartz, make sure that you enable the Authenticate connectionsoption under the Securitypane from the Preferencesmenu option.

**2** **Using** **Linux**

If you are new to Linux, see the provided Linux commands sheet, [https://www.student.cs.uwaterloo.ca/~c](https://www.student.cs.uwaterloo.ca/~s247/current/Assignments/P2/provided/gtkmm-examples.zip)s247/current/Assignments/P2/linuxCommands.pdf

**3** **Using** **GTKmm** **with** **ssh**

To use GTKmm through an sshconnection, X11 forwarding must be used. You must first install:

· On Windows: XMing. Install an X-server for Windows such as XMingand run it. Nothing will show up on the screen when you run XMing. You will need to make sure XMingis turned on each time you access your linux.student.cs.uwaterloo.caaccount. To enable X forwarding in PuTTy, under Connection/SSH/X11, check the box labeled Enable X11 forwarding. You may want to save this setting.

• On Mac: XQuartz. To enable X11 forwarding include the -Xand -Yflags in the sshcommand. You should also check your sshapplication’s settings to ensure that X11 forwarding is enabled.

ssh -X -Y *userid*@linux.student.cs.uwaterloo.ca

**4** **Debugging** **GTKmm** **over** **ssh** **connections**

You may experience some trouble using GTKmm over an sshconnection. A common error message is Gtk-WARNING \*\*: cannot open display:

*2* **Using** **GTKmm** **in** **the** **student** **environment**

When having trouble using GTKmm over an sshconnection, first try removing all of the files starting with .Xauthin your home directory by entering the following commands1:

$ cd $ pwd

*/u/userid*

$ rm .Xauth\*

**5** **Working** **with** **GTKmm**

First, make sure that you have the correct version of GTKmm installed. The student environment (ubuntu1604-NNN) is using version 3.18 (GTKmm 3.0) as the default. You can use the command

dpkg -l "\*gtkmm\*"

to see what version is installed if you want to be sure.

Note that when you both compile and link, you **must** specify the GTKmm package as the last argument on each of your compilation and linking command, as in:

g++ -c Window.cc `pkg-config gtkmm-3.0 --cflags --libs` -std=c++14 ...

g++ Window.o ... -o game `pkg-config gtkmm-3.0 --cflags --libs` -std=c++14

It is thus highly recommended that you set up your Makefileto do this for you, so that you don't forget. See the sample in the provided examples, [https://www.student.cs.uwaterloo.ca/~cs247/current/Assignments/P2/provided/gtkmm-examples.zip](https://www.student.cs.uwaterloo.ca/~s247/current/Assignments/P2/provided/gtkmm-examples.zip).

**Resources**

 GTKmm API documentation: https://developer.gnome.org/gtkmm/stable/pages.html  GTKmm 3 reference manual: https://developer.gnome.org/gtkmm/stable/

 GTKmm 3 tutorial: https://developer.gnome.org/gtkmm-tutorial/stable/  Glade: https://developer.gnome.org/glade/stable/index.html.en\_GB

 GTKmm 3 examples

https://www.student.cs.uwaterloo.ca/~cs247/current/Assignments/P2/provided/gtkmm-examples.zip,

[https](https://www.student.cs.uwaterloo.ca/~cs247/current/Assignments/P2/provided/gtkmm-examples/MVC/MVC.zip)://www.student.cs.uwaterloo.ca/~[c](https://www.student.cs.uwaterloo.ca/~cs247/current/Assignments/P2/provided/gtkmm-examples/MVC/MVC.zip)s247/current/Assignments/P2/provided/gtkmm-examples/MVC/

1 Note that $is the bashshell prompt, so you don't actually type it in. You don't need to enter the pwd command, but it's useful to confirm that you're in the correct location first.