Guide to the Windows Subsystem for Linux 2 (WSL 2)

Important: This is a guide to help you install Linux on a Windows 10 computer. The reason for this is that VirtualBox does not always run on newer Windows systems.

Step 1: Enable CPU virtualization

CPU virtualization must be enabled in your PC's BIOS/UEFI; in most cases it is already active. Your processor must support virtualization. To check, go to the manufacturer's website and look up your chipset. For Intel this is VT-x/VT-d, for AMD processors it is AMD-V.

To get into the BIOS/UEFI, shut down your PC and start it again. During startup, press F2, F10 or ESC to enter the BIOS/UEFI. Look around there for the virtualization setting – it is usually somewhat hidden. Here is an example of what it might look like:

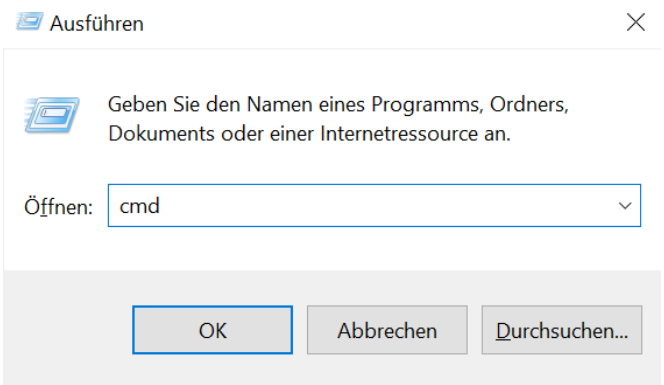


This is what it looks like in the BIOS with an Intel chipset

Finally, save your changes in the BIOS and restart the PC.

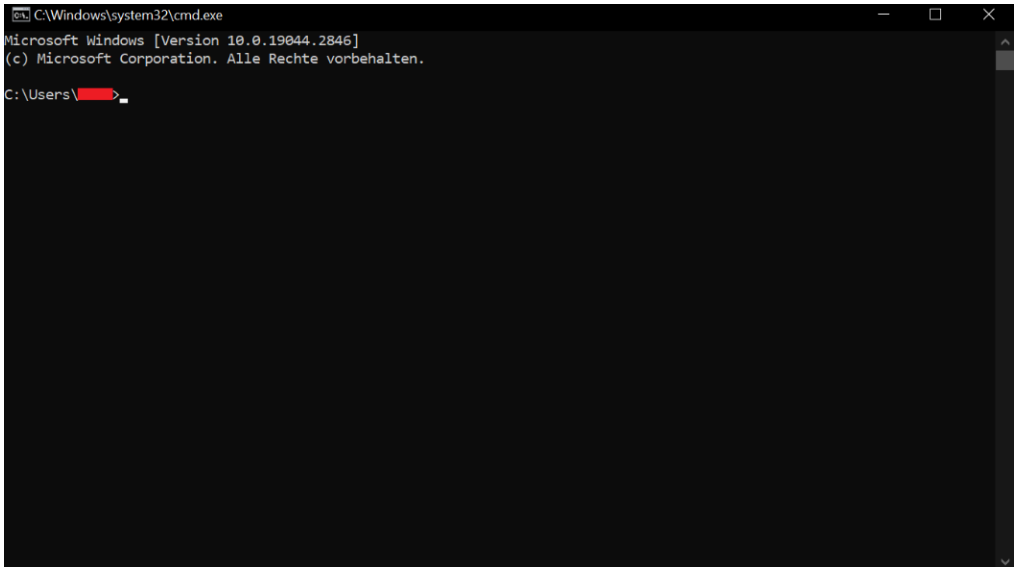
Step 2: Open and run CMD (Windows Command Prompt)

Press the [Windows] + [R] keys at the same time. A small window appears immediately; type **`cmd`** into it and press [Enter]. Upper and lower case do not matter here.



This window should now appear on your screen

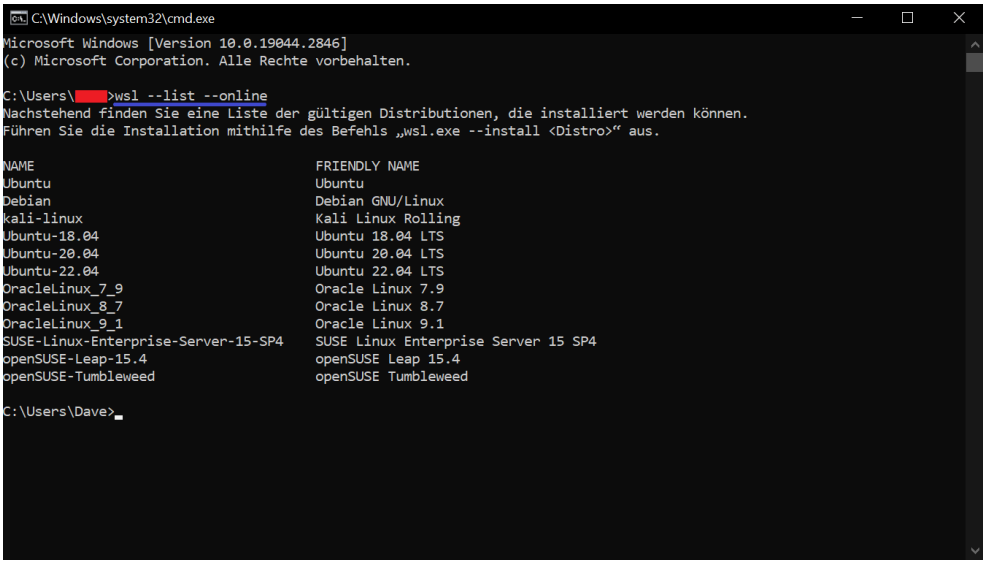
After this, CMD should open on your screen and look like this:



This is what the CMD terminal looks like – your username appears where the red bar is

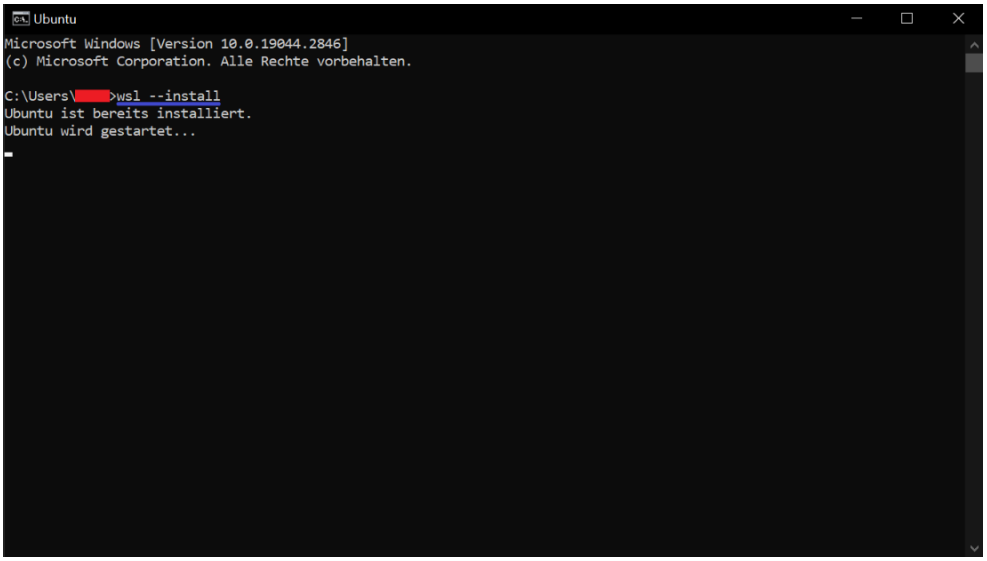
Step 3: Set up WSL on your Windows computer

With the command **`wsl --list --online`** followed by [Enter], you can see the Linux distributions that are available. These are not all the distributions Linux has to offer – you can only install the ones listed here, because Microsoft has adapted them.



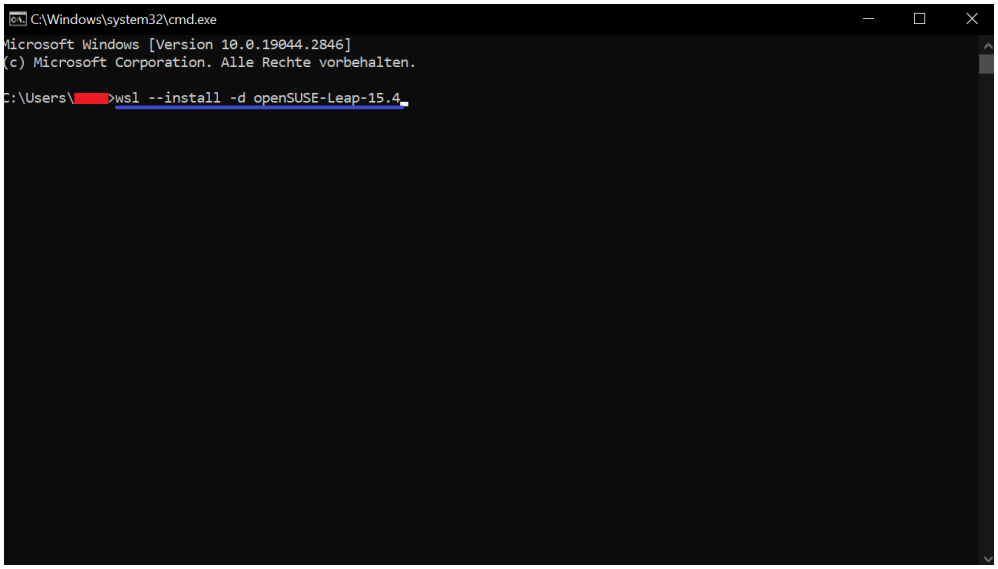
Command: "wsl --list --online" in the CMD terminal

To set up your first WSL, enter the command **`wsl --install`** and confirm with [Enter]. This command installs the default Linux distribution "Ubuntu" as your WSL.



Command: "wsl --install" for Ubuntu

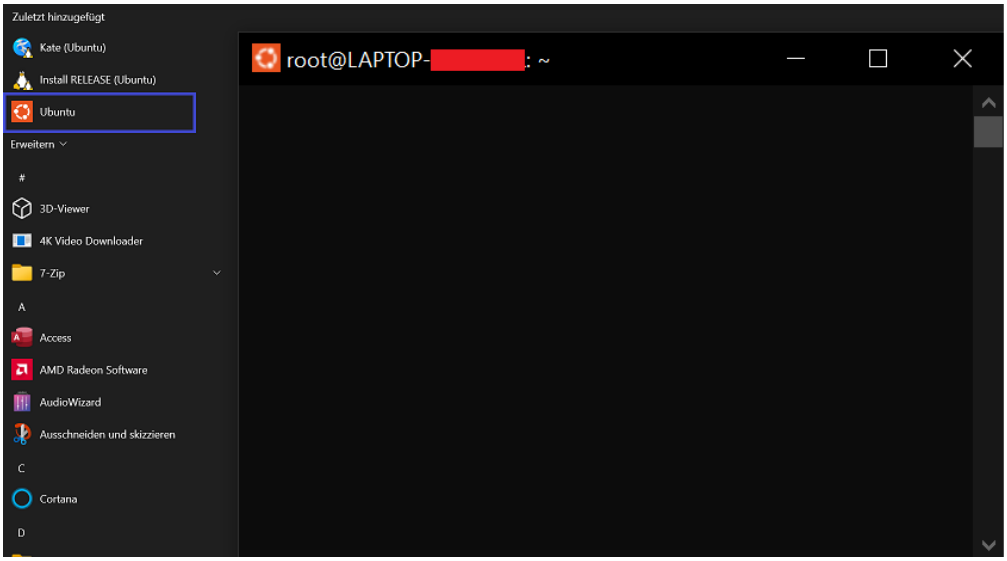
To install a different Linux distribution, enter the command **`wsl --install -d [Linux distribution]`** followed by [Enter]. Here is an example with openSUSE:



Command: "wsl --install -d openSUSE-Leap-15.4"

Now wait until the installation is complete; then you can close CMD. During this step you may be asked to set a username and password. These will be your login credentials for the Linux system.

An icon for the Linux distribution you installed should now appear under newly installed programs. Clicking it opens a terminal of that Linux distribution. You have now successfully installed a fully functional Linux distribution on Windows.

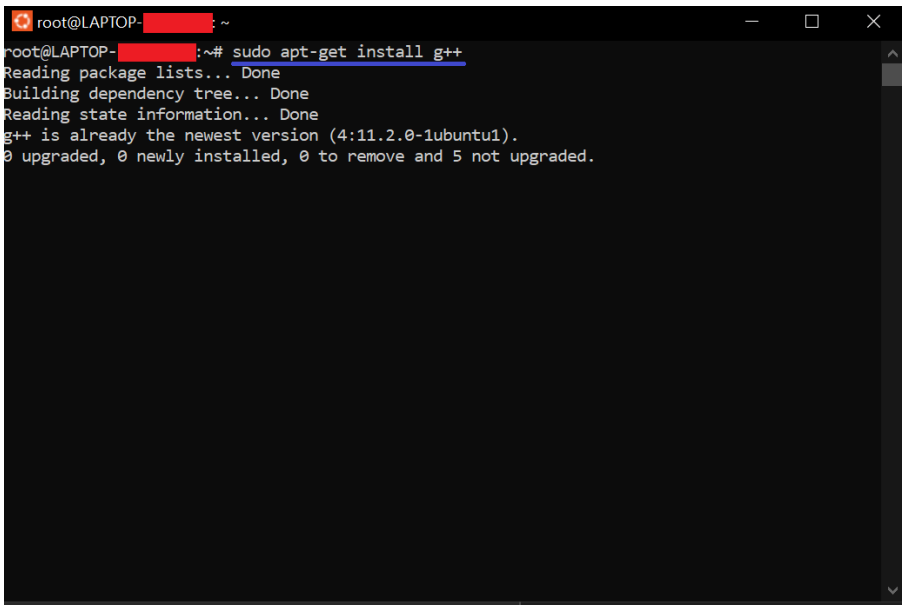


This is what the icon and the Linux terminal should look like

Step 4: Set up the compiler in WSL

To work with Linux and program in C in the first semester, you should get familiar with the Linux environment. WSL is a fully functional Linux system running on Windows. You use exactly the same commands as in the lectures.

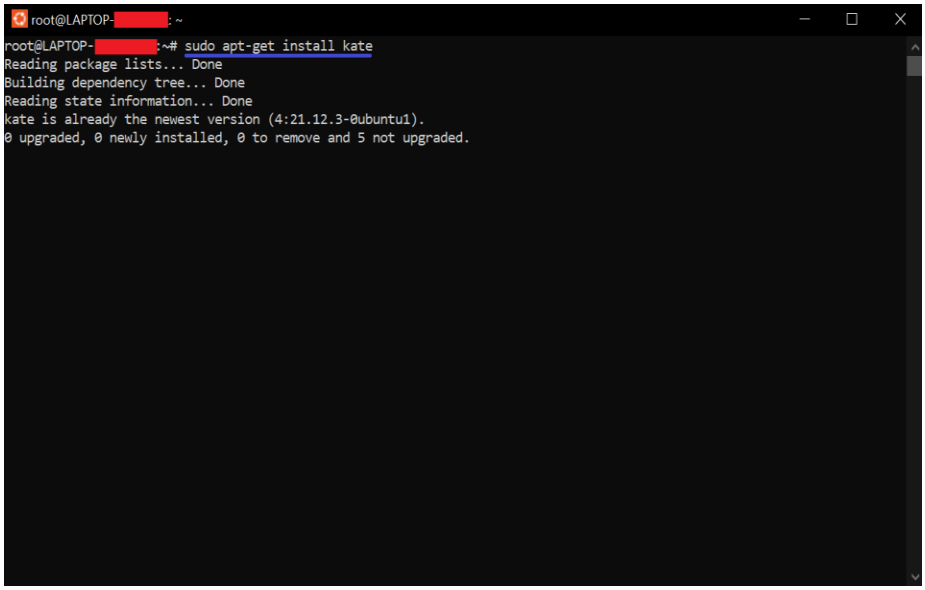
To program in C, we need to install the C/C++ compiler and the Kate editor. For Ubuntu, enter the commands **`sudo apt-get install build-essential`**, **`sudo apt-get install gcc`** and **`sudo apt-get install g++`** in the terminal; for openSUSE, use the command **`sudo zypper install gcc-c++`**.



Command: "sudo apt-get install g++"

Step 5: Install the Kate editor

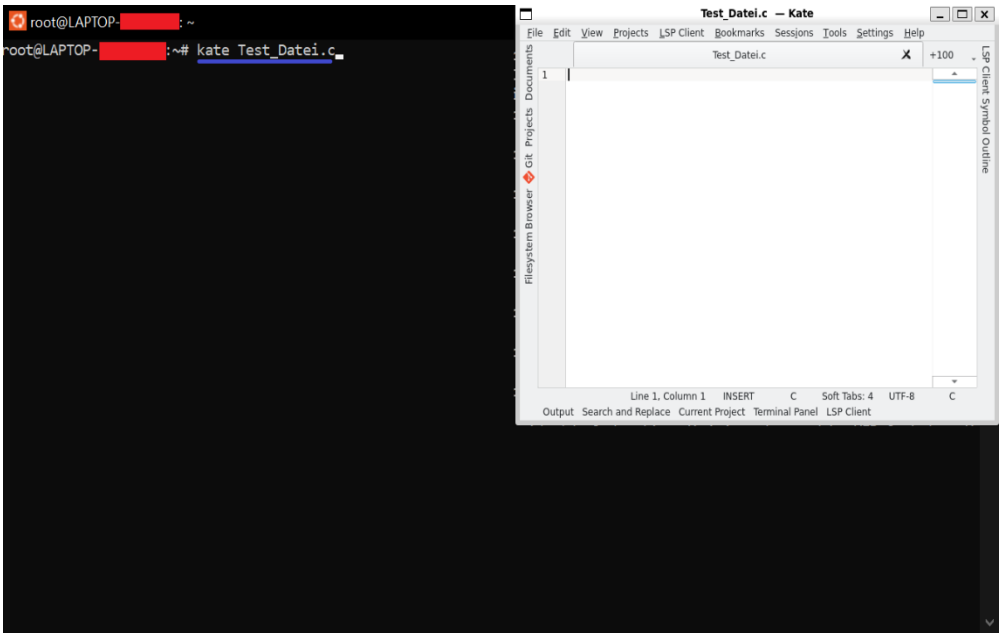
The command **`sudo apt-get install kate`** installs the Kate editor, which is also used in the C lectures/exercises.



Command: "sudo apt-get install kate"

Step 6: Launch the Kate editor

As on any regular Linux distribution, you can launch the Kate editor with the command **`kate`**. Here is an example:



Command: "kate Test_Datei.c"

The command **`exit`** closes the Linux terminal.

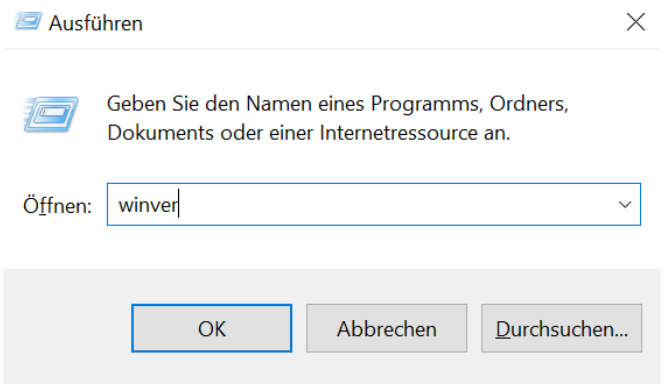
Bonus material: Installing X11 apps

The Windows Subsystem for Linux (WSL) now supports running Linux GUI applications (graphical user interface applications). The requirements are:

- Windows 10 Build 19044 or higher (including Windows 11)
- Installed drivers for vGPU

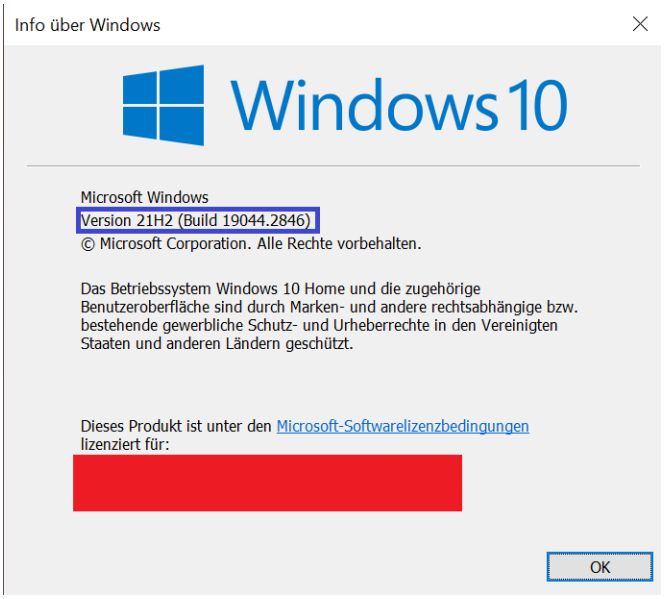
Step 1: Find out your Windows version

To find out whether you have Windows 10 Build 19044 or higher, press the [Windows] + [R] keys. A small window appears immediately; type **`winver`** into it and press [Enter] again.



This window should now appear on your screen

A window with information about your version should then pop up. There you can see whether you have Windows 10 Build 19044 or higher.



This window should appear – check your version in the blue box

Step 2: Install vGPU drivers

Once you have confirmed that you have the right Windows build, you need to install the correct drivers for virtual GPU (vGPU) for your system.

For Intel, the link is:

https://www.intel.com/content/www/us/en/download/19344/intel-graphics-windows-dch-drivers.html

For AMD, the link is:

https://www.amd.com/en/support

For NVIDIA, the link is:

https://www.nvidia.com/Download/index.aspx?lang=en-us

Step 3: Update WSL

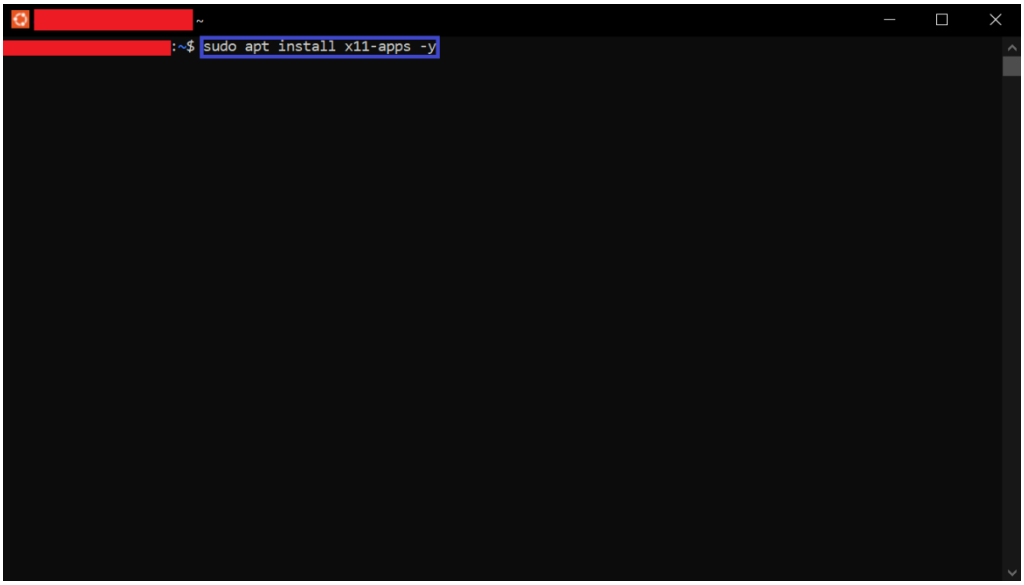
To be able to use X11 apps, you need to update your WSL distribution. This is easily done with the command **`sudo apt update`**, which you enter in your WSL terminal.



Command: "sudo apt update"

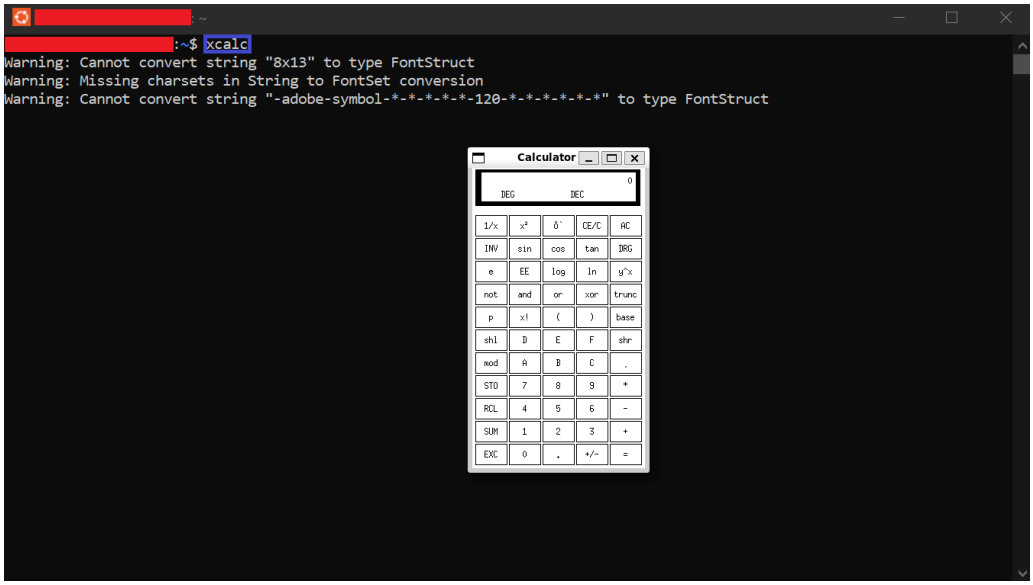
Step 4: Install X11 apps

Once this step is done, you can install X11 apps with the command **`sudo apt install x11-apps -y`**. These include apps such as xclock, xcalc (calculator) or xclipboard.



Command: "sudo apt install x11-apps -y"

After installing the X11 apps, you can launch each app by typing its name. Here is an example with the xcalc app (calculator):



Command: "xcalc"