

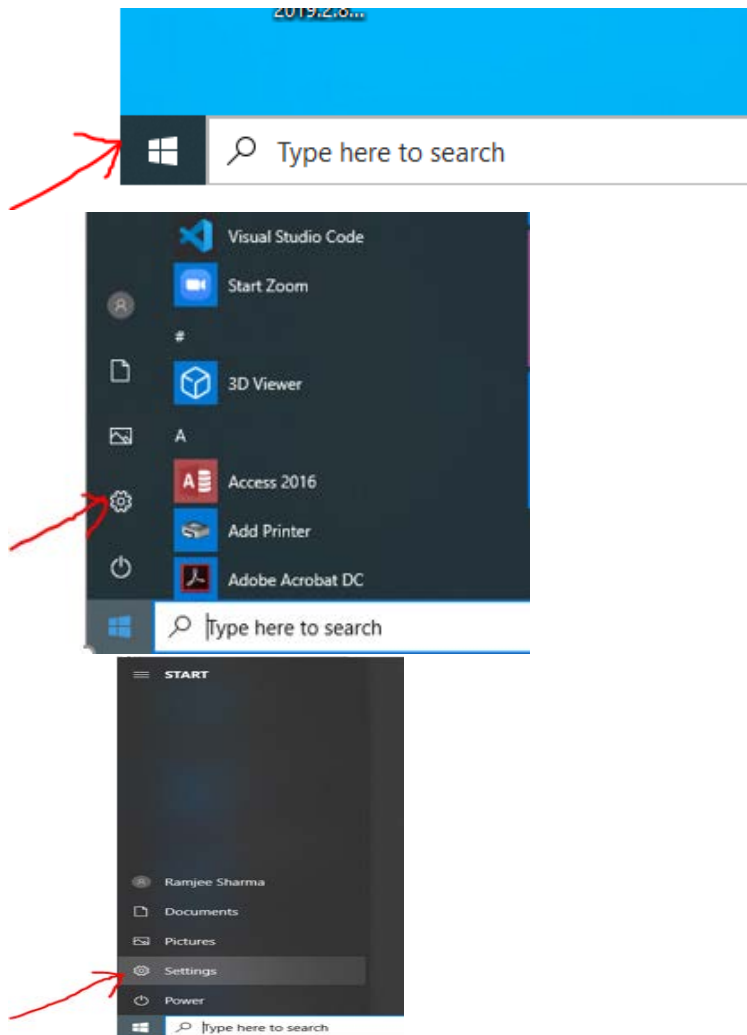
## Cygwin and FFTW3 Installation in Windows 10

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In this tutorial, I will present a few basic steps on how to install Cygwin in a Windows 10 machine. Cygwin is a mini Linux environment in Windows. If you are a mac or Linux user, there is no need to learn about Cygwin. The installation of FFTW3 will work in any environment. Advanced users of Linux or Cygwin will have a different opinion.

I will also show how to install the necessary packages to run a fortran 95 program in Cygwin including gcc, gfortran, openmpi, gnuplot and fftw3. The prerequisite knowledge for this tutorial is a basic computer literacy. Some experience in Linux terminal and windows Command Prompt will be a plus.

1. 32 or 64 bit?



## Windows Settings

Find a setting



### System

Display, sound, notifications, power



### Devices

Bluetooth, printers, mouse



### Phone

Link your Android, iPhone



### Network & Internet

Wi-Fi, airplane mode, VPN



### Personalization

Background, lock screen, colors



### Apps

Uninstall, defaults, optional features



### Accounts

Your accounts, email, sync, work, other people



### Time & Language

Speech, region, date

Scroll down to About or type About in the box.

Home

Find a setting

### System

Storage

Tablet mode

Multitasking

Shared experiences

Clipboard

Remote Desktop

① About

## Display

### Rearrange your displays

Select a display below to change the settings for it. Press and hold (or select) a display, then drag to rearrange it.

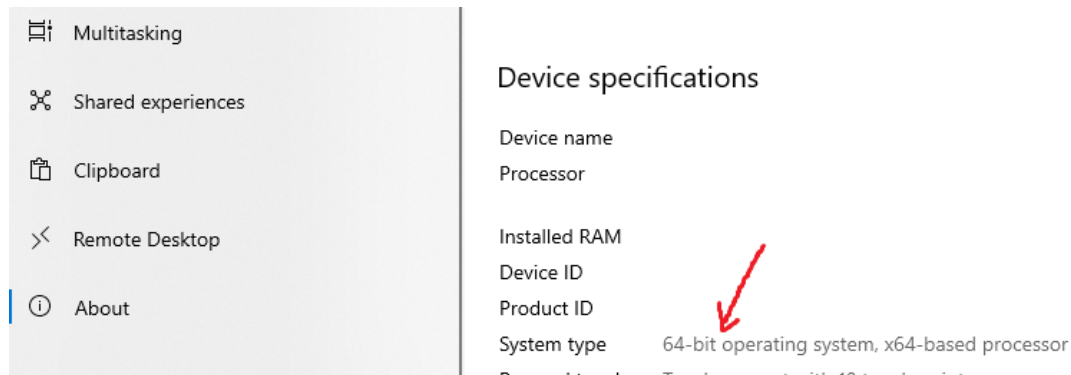
112

Identify

Detect

### Brightness and color

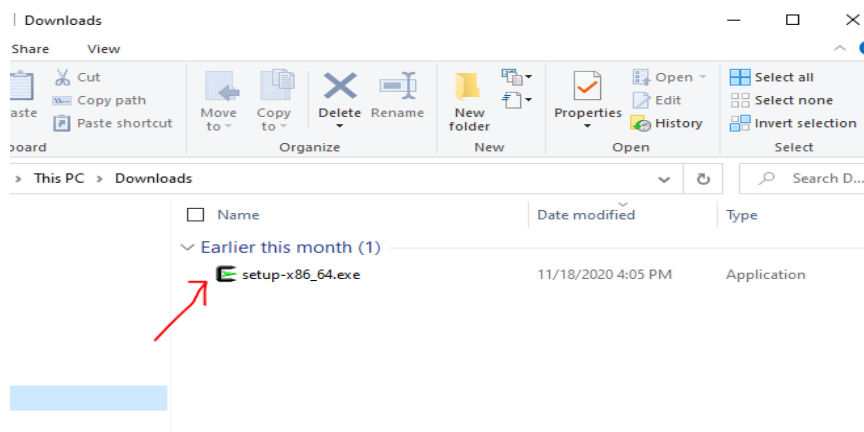
Change brightness for the built-in display

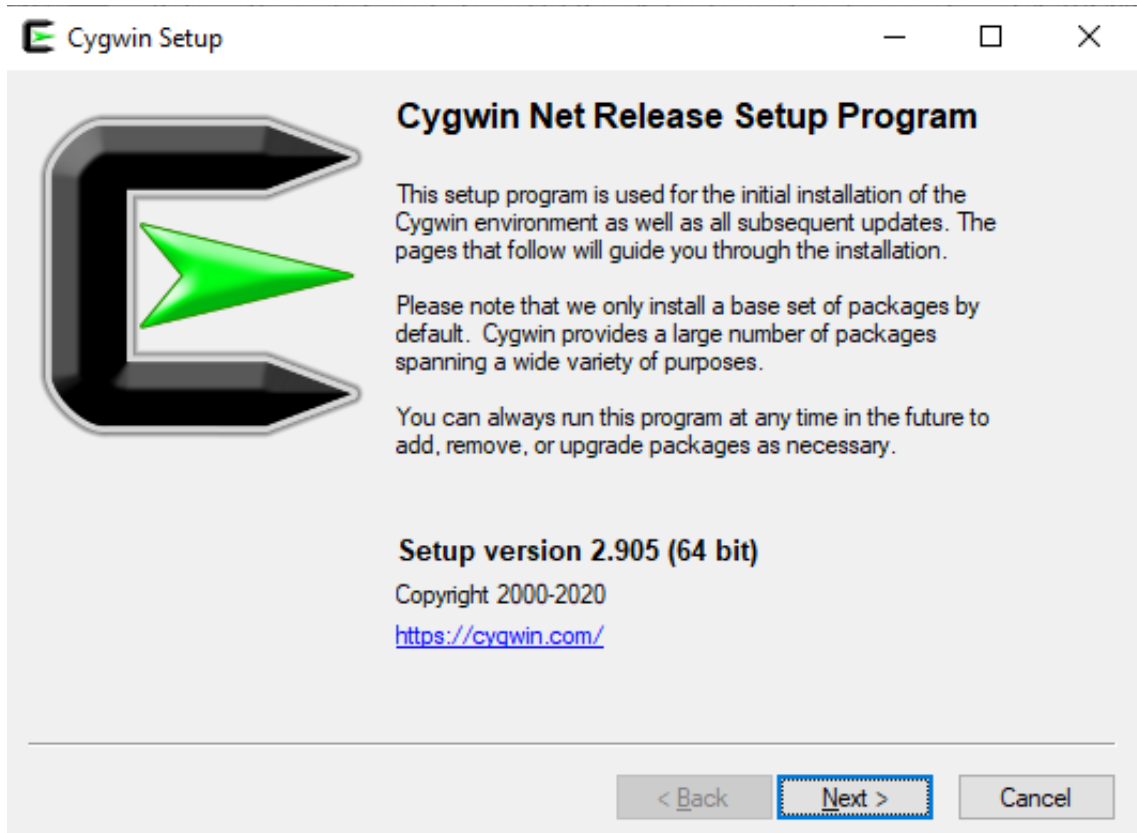


2. Go to <https://www.cygwin.com/install.html> and click on the .exe file based on the 32 or 64-bit window.

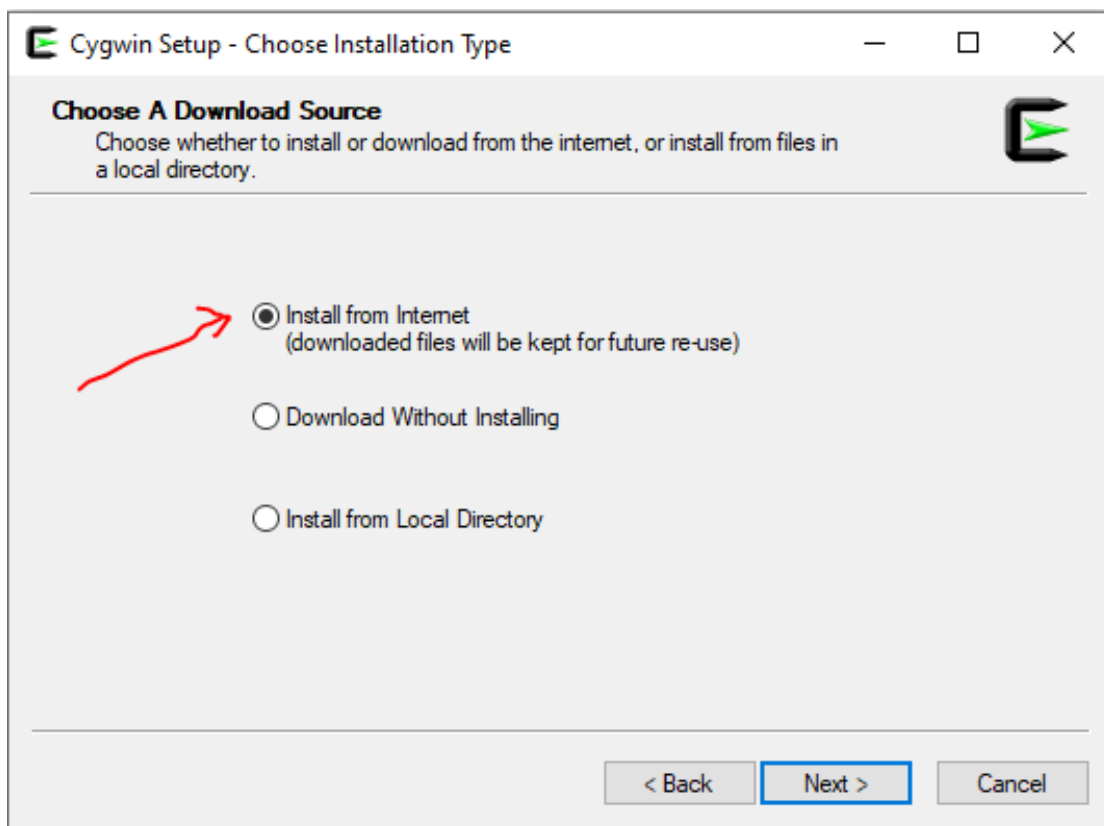


3. Go to the download folder and double click on the downloaded .exe file.

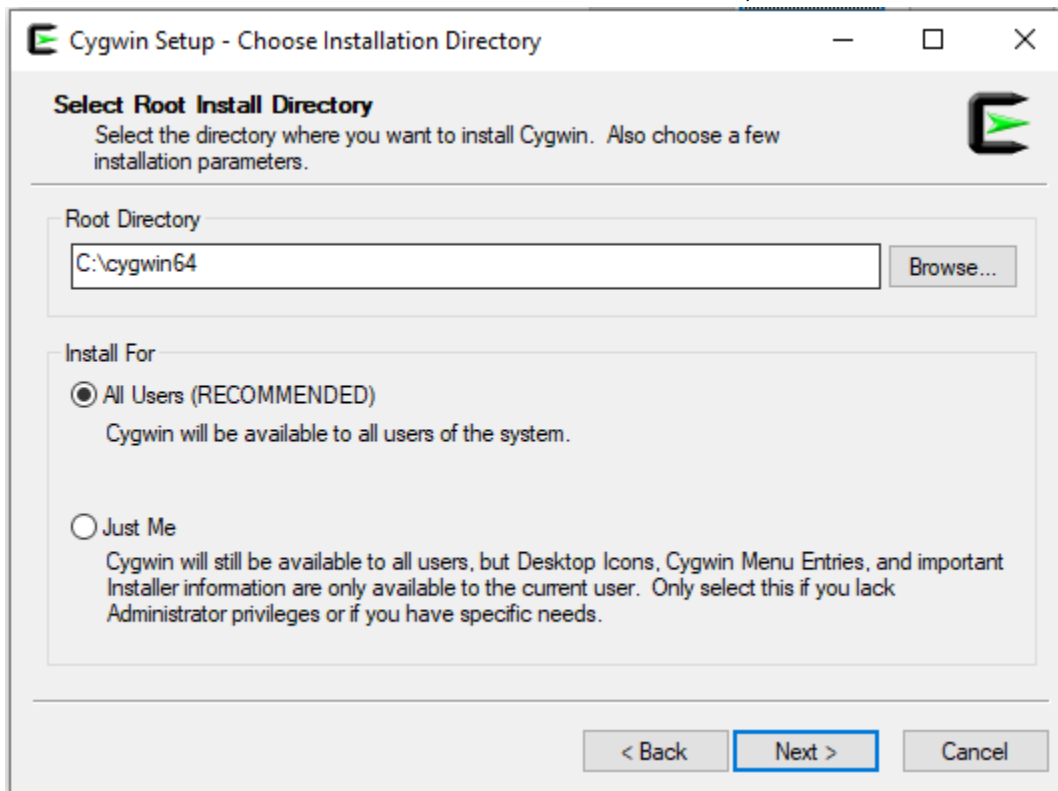




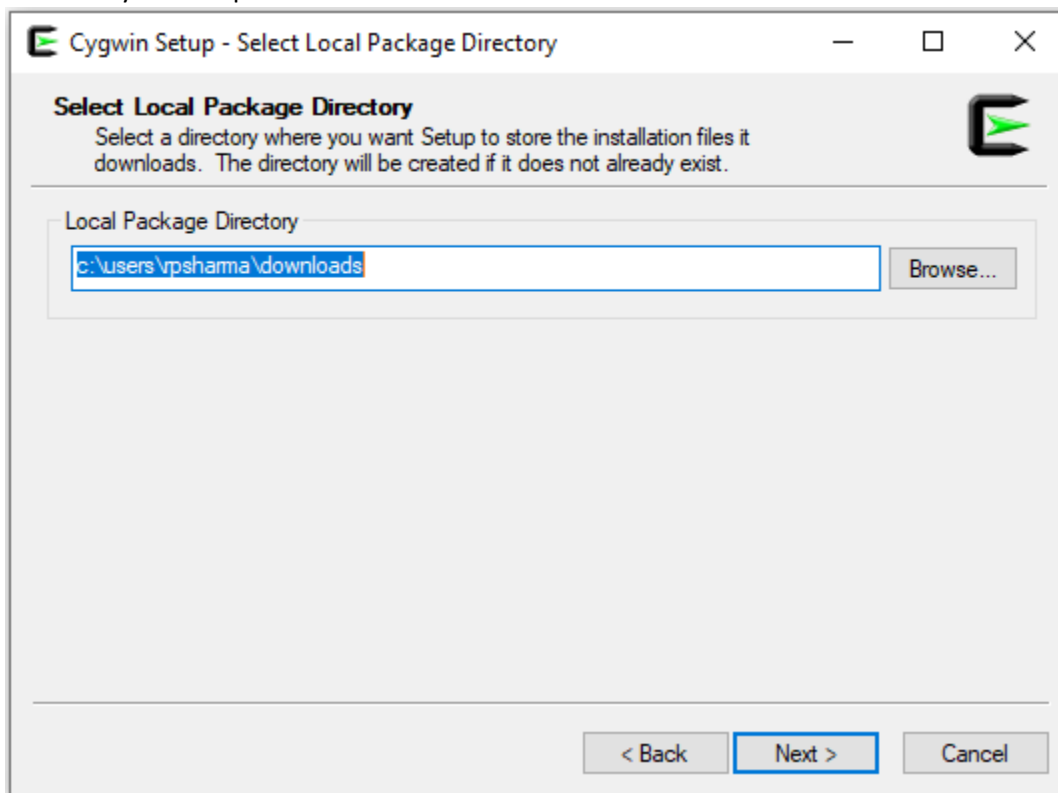
Click on Next



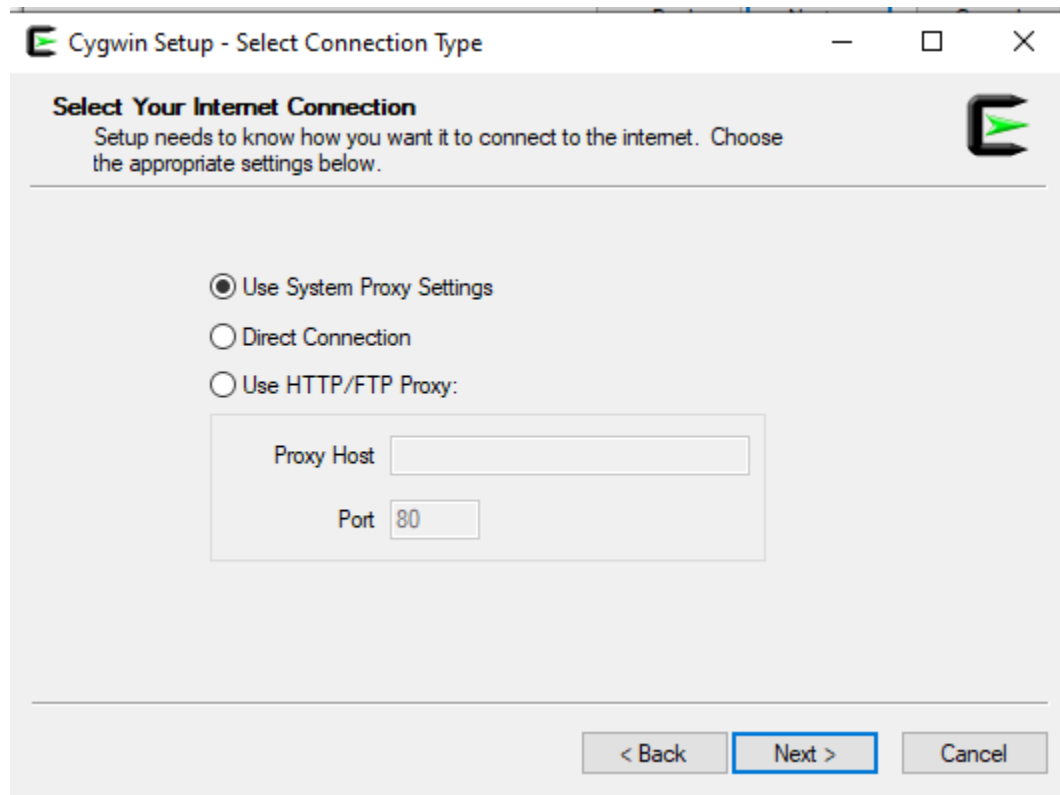
Leave install from Internet selection as it is. If it is not selected, select that and click on Next.



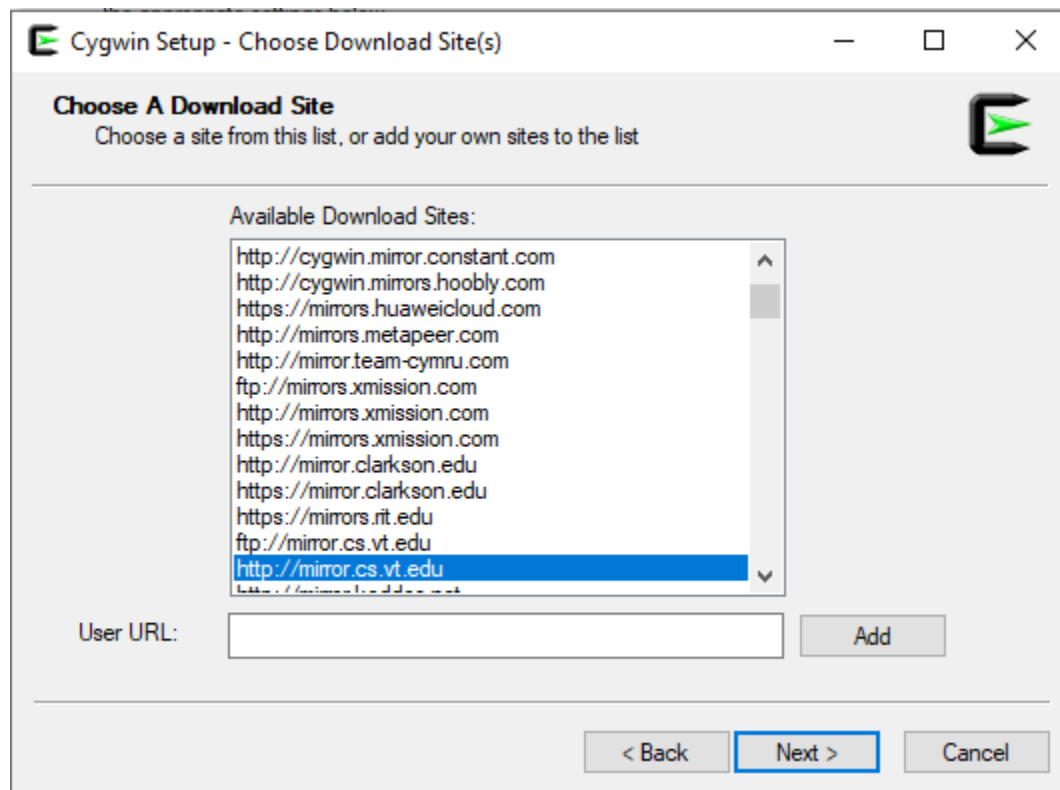
Click on Next. It will take you to the following window. The text inside the box will be different based on your computer user name.



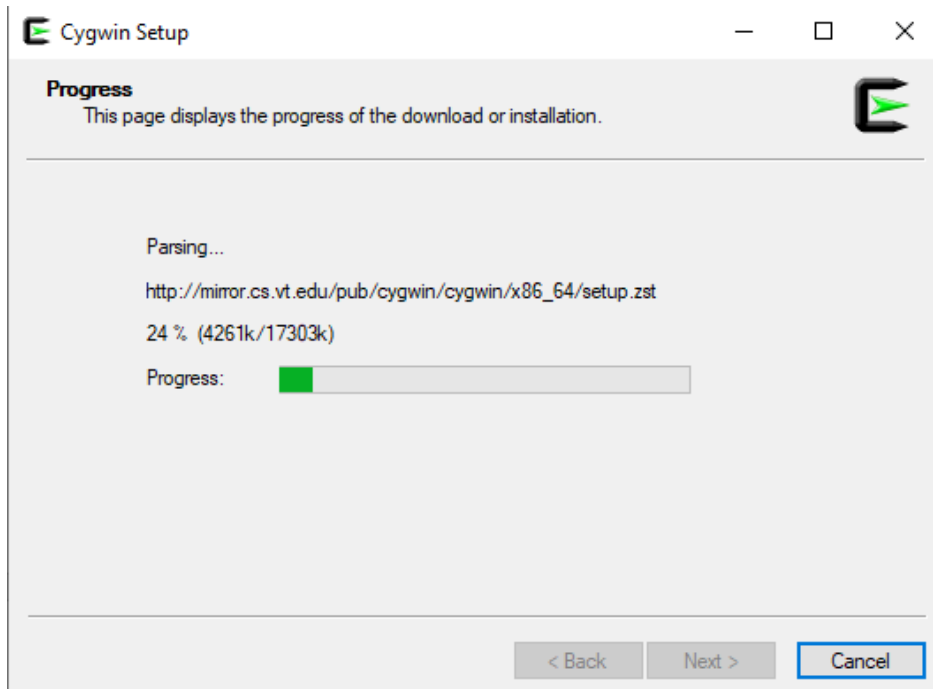
Click on Next.



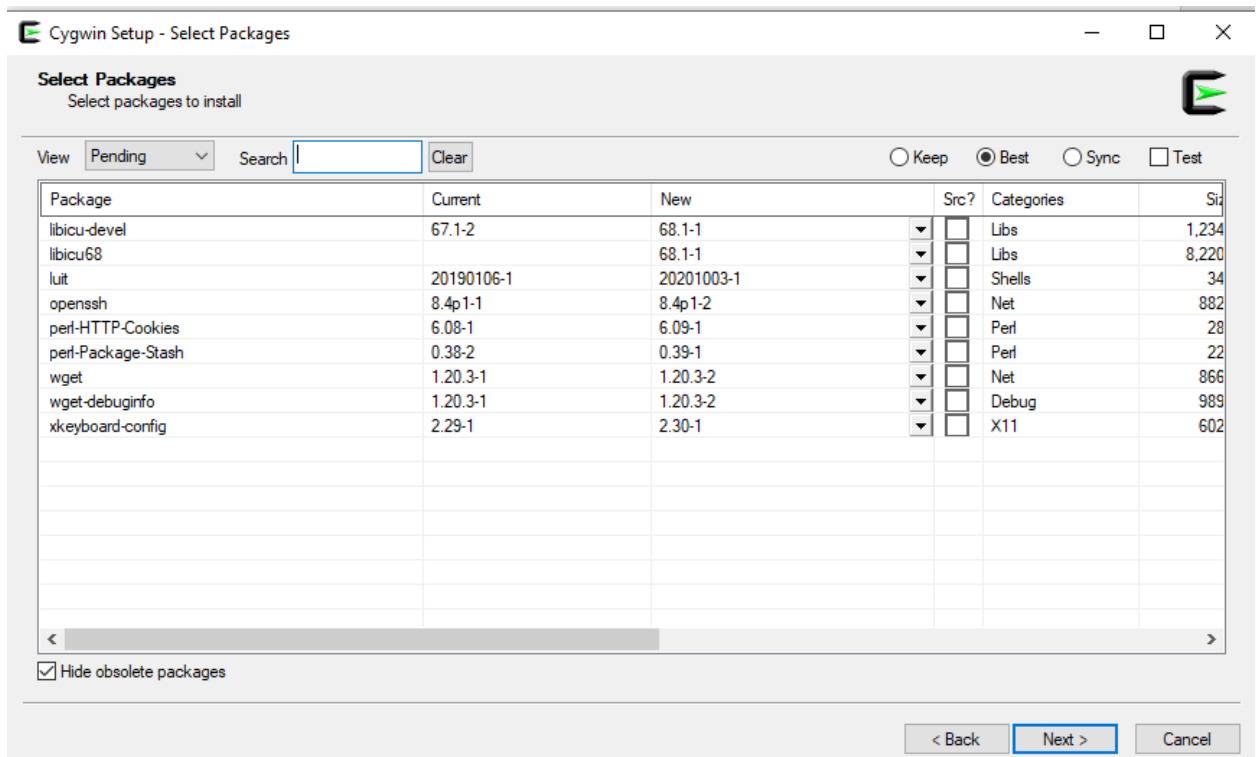
Leave the selection Use System Proxy Settings as it is. If it is not selected, select it and click on Next.



Here you can select different website do download the Cygwin packages from. You can just leave the one that is selected by the system (in this case <https://mirror.cs.vt.edu>). Then, click on Next.



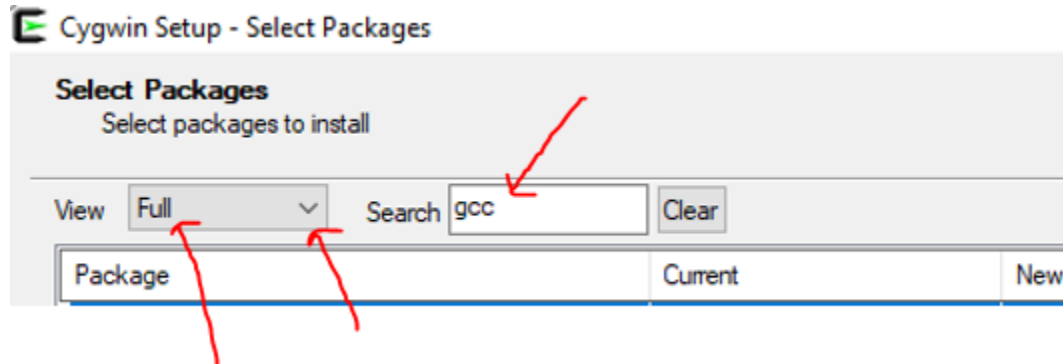
This will take some time depending on your download speed. It will open the package selection window.



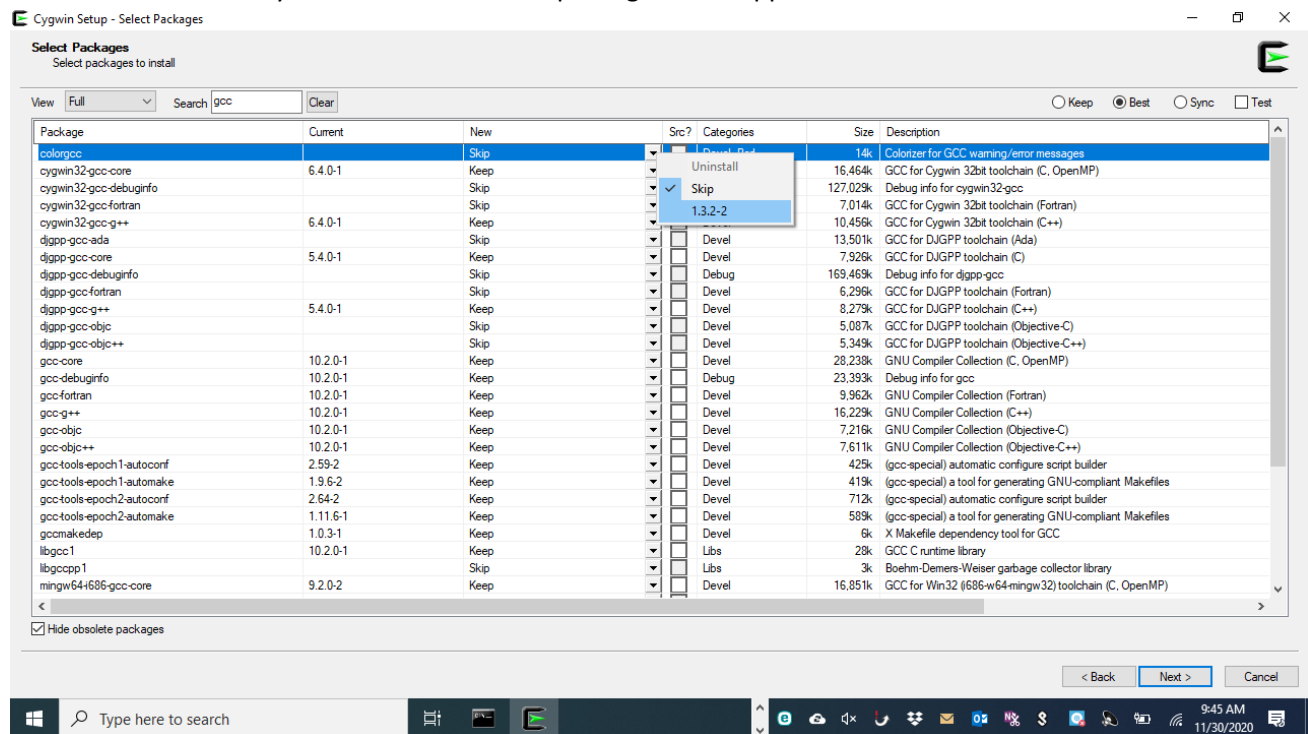
This part is very important. The system will select the minimum packages. You need to select all the additional packages that we need manually. We need several packages including gcc,

gfortran, gnuplot, x11, fftw and openmpi. Just type the package name in the search box and you will see the related packages.

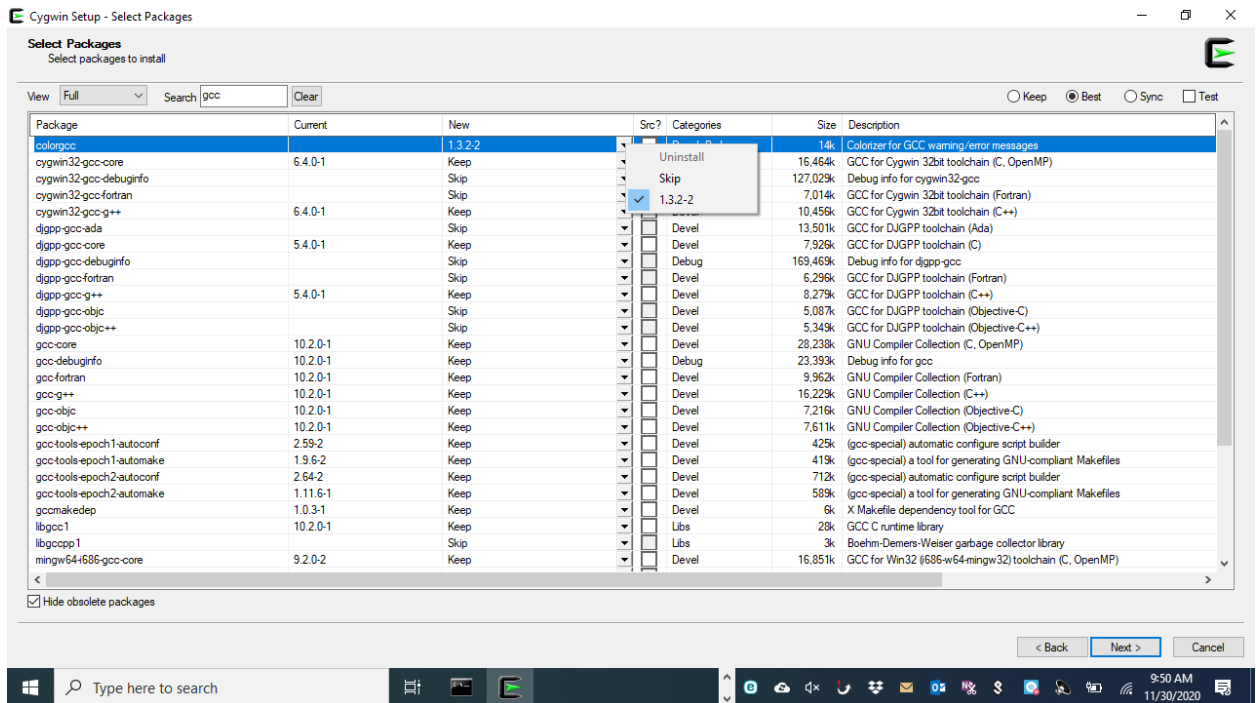
Gcc package. Click on the down arrow key by the View and change the view into Full. Then type gcc in the search box.



You must install all the packages here. Click on the down arrow key by each package and select the version number. By default most of these packaged are skipped.

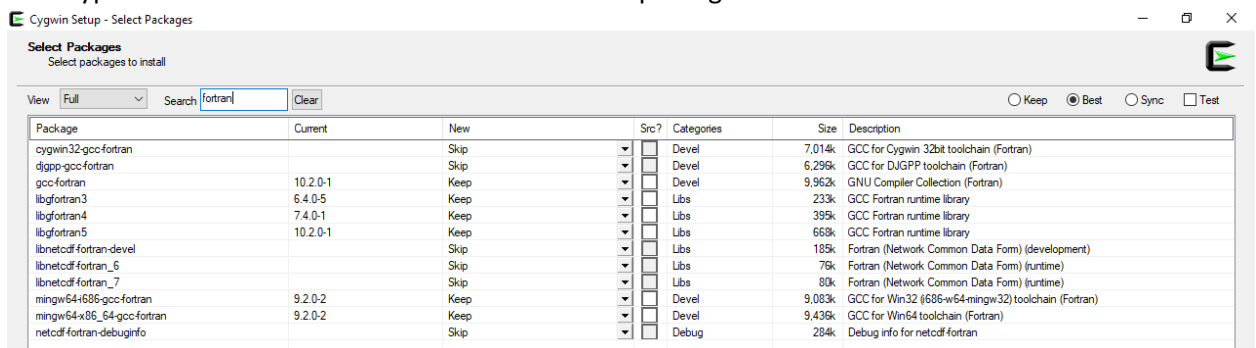




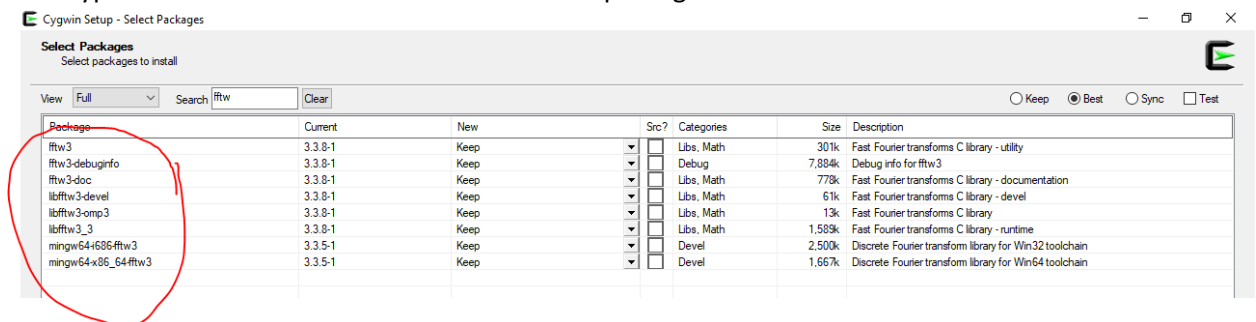


Do not click on Next yet. You need to select other packages.

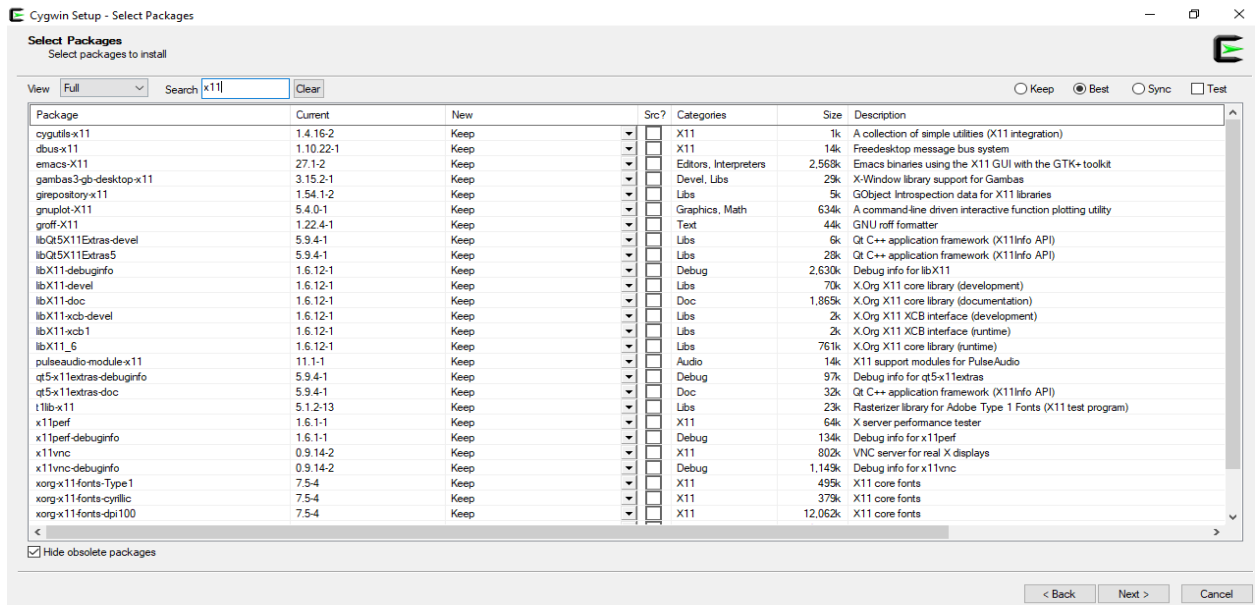
Next type fortran in the search box and select all the packages as before.



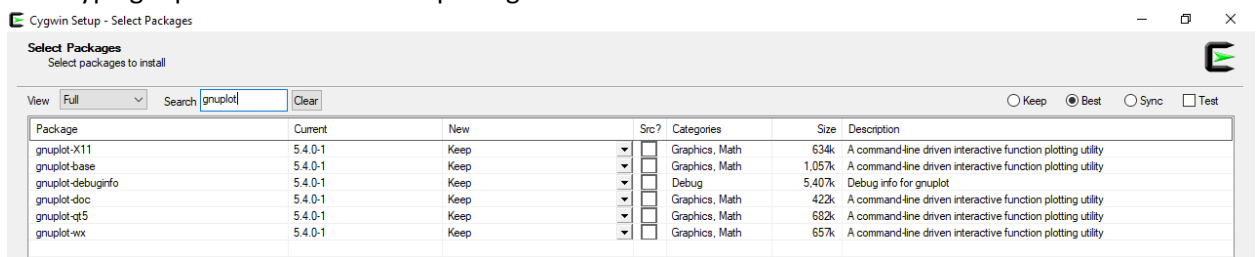
Next type fftw in the search box and select all the packages as before.



Next type x11 select all the packages.

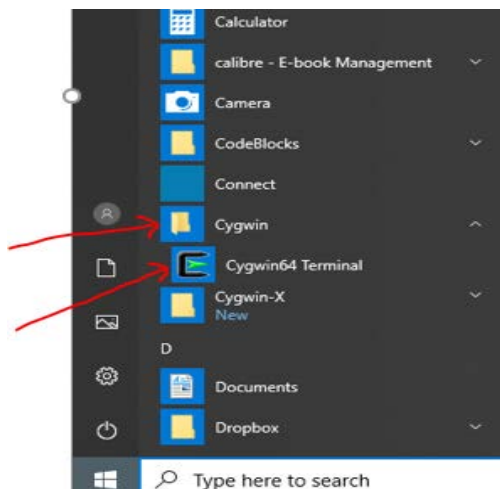


Next type **gnuplot** and select all the packages.



You can select additional packages as you wish. You can always do this later. Once you complete your selection, click on **Next**.

The installation may take several hours depending on the internet speed. Once the installation is complete, you should see Cygwin in your start Menu.



Finally, the Cygwin Terminal window will open as follows.



While Cygwin can install the FFTW3 during the installation process, I prefer a separate FFTW3 installation as follows.

### Installation of FFTW3 in Cygwin

1. Open an internet browser and go to <http://www.fftw.org/download.html>
2. Download the tar file **[fftw-3.3.8.tar.gz](#)**
3. Go to the Downloads folder/ or the folder where the file is downloaded  
Also, open another file explorer in a new window and go to C/Cygwin64//home/<your username>  
Copy/paste or move the file **[fftw-3.3.8.tar.gz](#)** from the download folder to the folder inside the Cygwin directory C/Cygwin64/home/<yourusername>
4. Open the Cygwin terminal window and type the command ls. You will see the fftw3 tar file. You need to untar the tar file by typing the following command:  
tar -zxvf fftw-3.3.8.tar.gz
5. Change the directory into fftw-3.3.8 by typing  
cd fftw-3.3.8
6. Next you need to type the following three lines of commands one at a time to install the fftw3 with the parallel mpi and openmp options:

```
./configure --enable-openmp --enable-threads --enable-mpi  
make  
make Install
```

Note that the configure, make and install commands may take several minutes to complete. Now you will have already installed all the necessary packages of fftw3. To check if the installation took place correctly or not, type the following on the Cygwin terminal. You will see something like this below.

whereis fftw3.f

```
$ whereis fftw3.f
fftw3: /usr/include/fftw3.f /usr/include/fftw3.f03 /usr/include/fftw3.h /usr/share/info/fftw3.info-1.gz /usr/share/info/fftw3.info-2.gz /usr/share/info/fftw3.info.gz
```

whereis mpi

```
$ whereis mpi
mpi: /usr/lib/mpi.mod /usr/include/mpi.h
```

whereis mpif.h

```
$ whereis mpif.h
mpif: /usr/include/mpif.h
```

Note: If you are not planning to do the parallel computing, you do not need to worry about the mpi packages.