DEPARTMENT OF ELECTRICAL AND COMPUTER ENGINEERING
UNIVERSITY OF BRITISH COLUMBIA
CPEN 211 – Introduction to Microcomputers
Installing Cygwin for Lab 7

1. Introduction. To use the assembler with Lab 7 you need to install a Windows program called "Cygwin". Cygwin provides a UNIX style environment on a Windows computer. To use it with Lab 7 it needs to be configured to install certain software tools that will be used for compiling the assembler from the source code provided for the assembler program. This document walks through the necessary steps. This document was created about a year ago so some of the screen shots may not exactly match what you see but it gives you an idea. The tools that need to be installed are "g++", "make", "bison", "flex".

2. Background. The four tools listed above are all well-known UNIX based software development tools. "g++" is an open source C++ compiler. "make" is a tool widely used in industry for building large software projects from the command line. "bison" and "flex" are programs that enable to specify your own programming languages. E.g., if you really don't like Verilog and think you could design a better language, you would want to use software like "bison" and "flex" to help design your own hardware description language. Technically, "bison" is a parser generator and "flex" is a lexical analysis generator. Flex allows you to specify the "tokens" in a language (e.g., keywords, numbers, comments, etc…) and "bison" allows you to specify the way these tokens can be combined. Last year one of the TA's (Ayub Gubran) used "flex" and "bison" to implement a parser for the assembly programming language for the Simple RISC Machine. Ayub also created the Cygwin install guide below.

3. Installing Cygwin.

1- First, you need to download the Cygwin installer from: https://cygwin.com/install.html. The webpage will look like Figure 1. As you can see, you have two versions of the Cygwin installer for 32-bit and 64-bit machines. Download the version that matches your machine (which will be probably a 64-bit one).

Figure 1

2- Next run the installer.

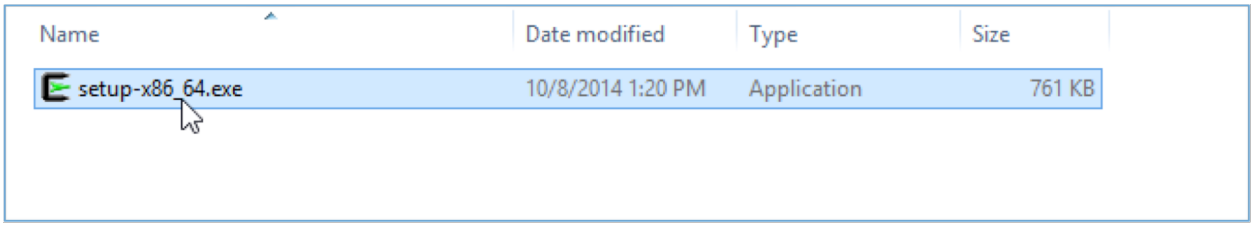

Figure 2

3- Once the installer is running click next.

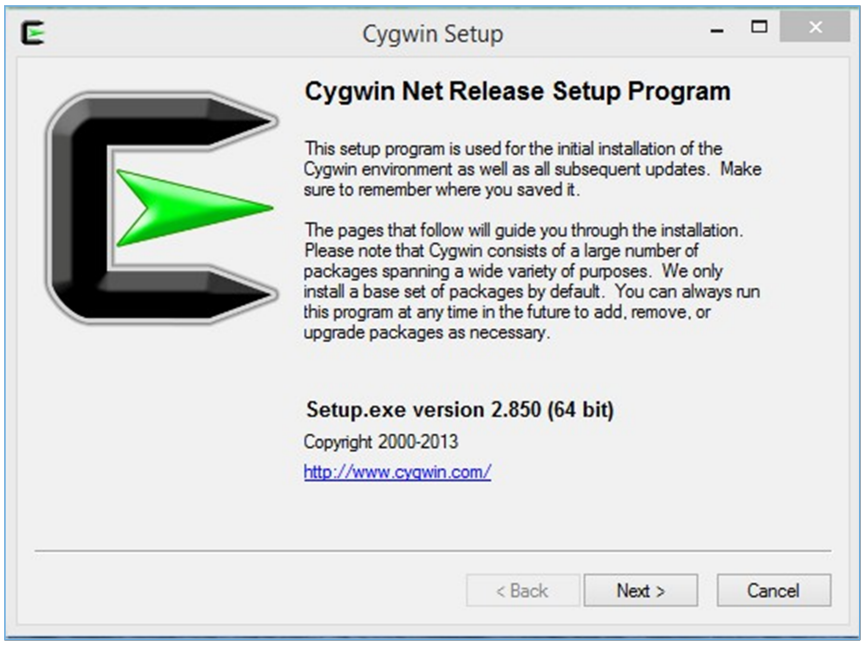

Figure 3

4- Make sure **Install from Internet** is selected then click next.

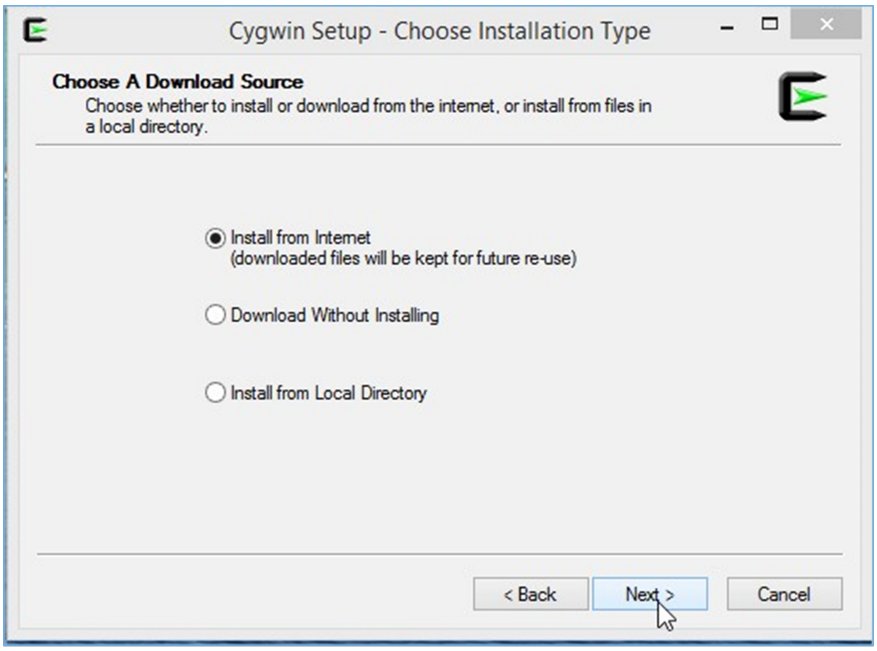

Figure 4

5- In the next step you can specify where you want Cygwin to be installed. You can use the default directory (**C:\cygwin64**).

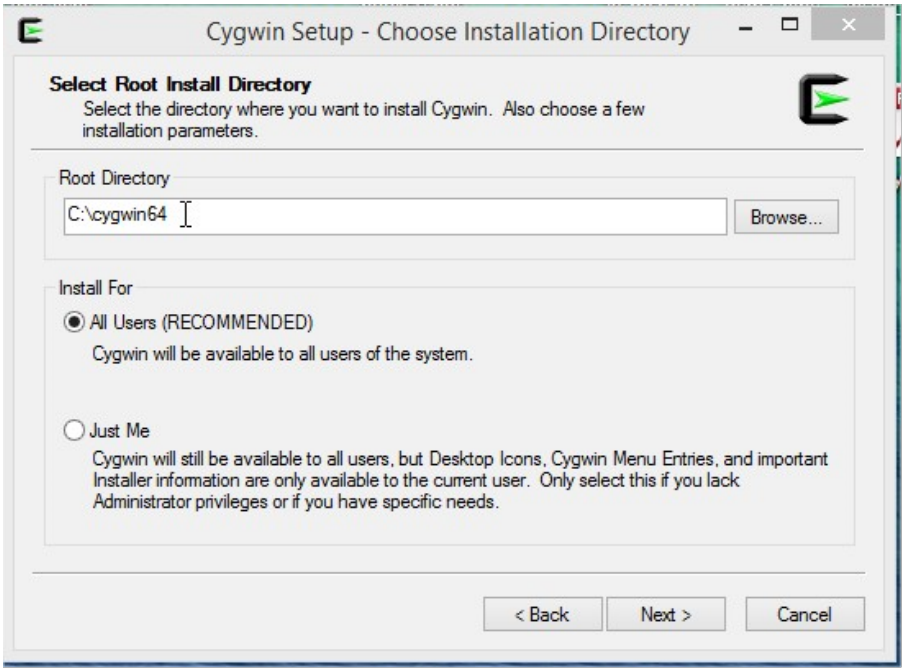

Figure 5

6- Next, you can specify where you want to store the installation files (again, you can leave it to the default value “C:\Users**UserX**\Downloads”, where UserX will be your account name.

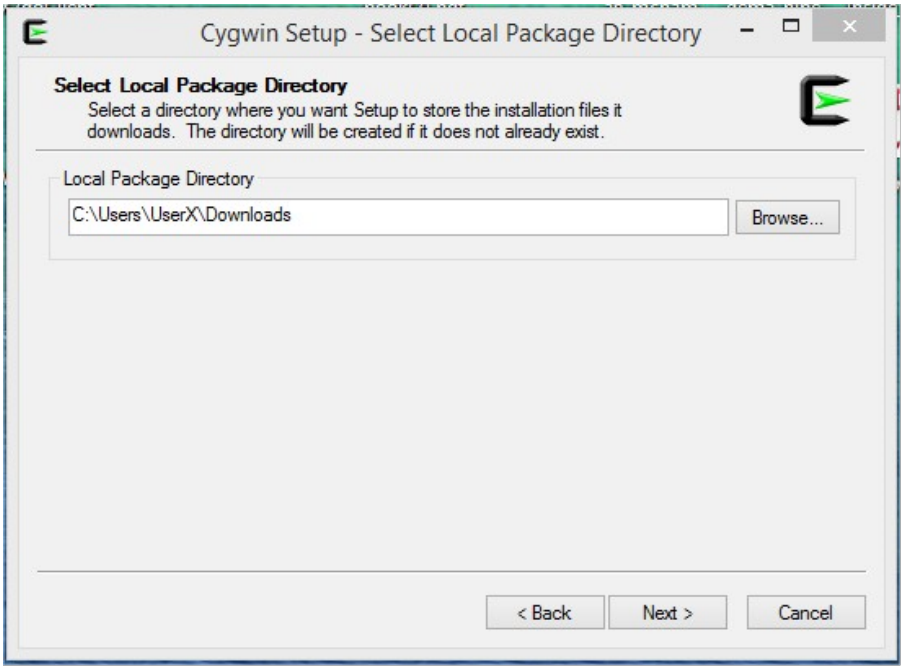

Figure 6

7- Now choose Direct Connection and press next.

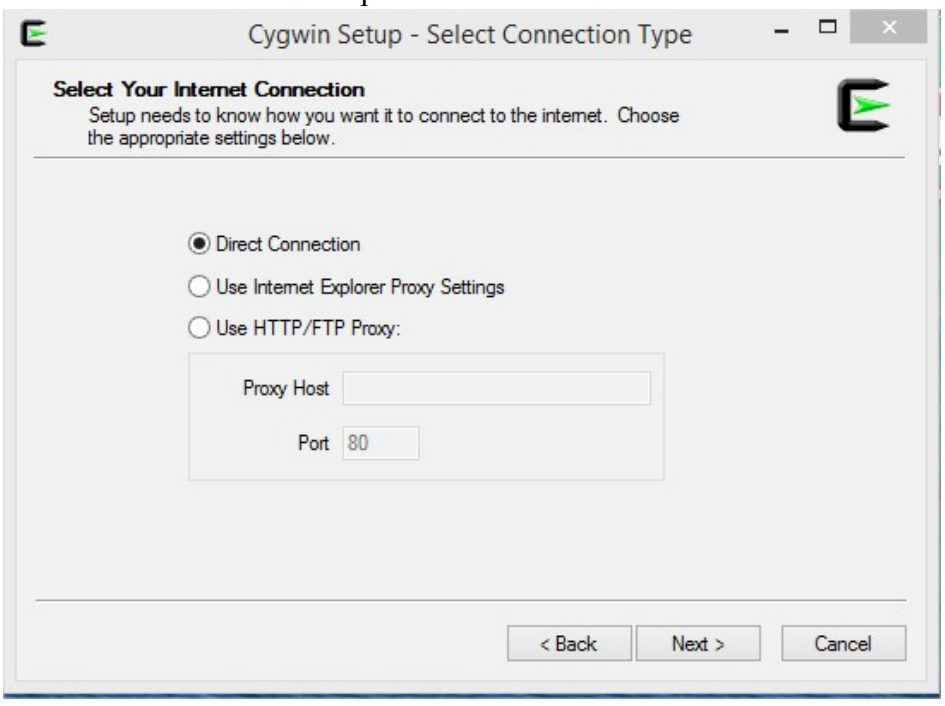

Figure 7

8- Here you can choose where to download Cygwin from. Any download site should be fine. Choose any of them then press next.

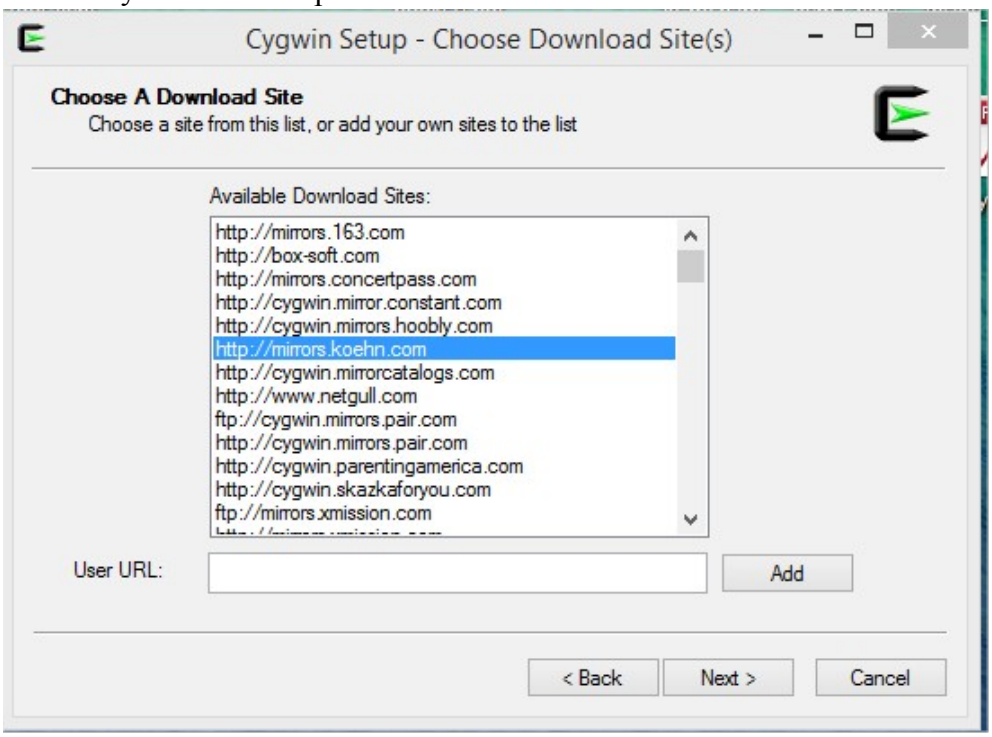

Figure 8

9- Now you will see the package selection window as shown in Figure 9. This step is very important. Now we need to select which packages we want to install. For this lab we will need the following packages: gcc, make, flex and bison. We will see how to install them in the next steps.

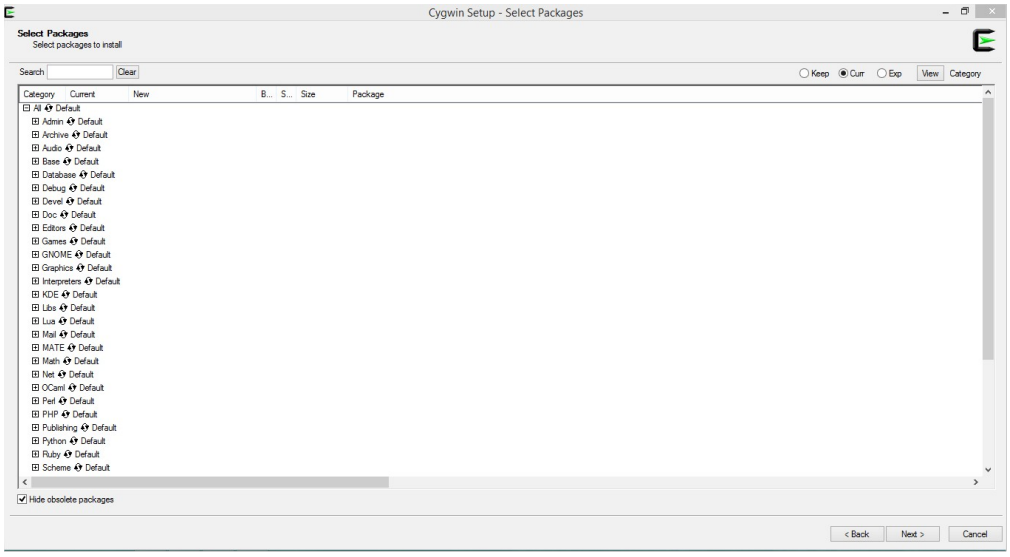

Figure 9

10- First we will add gcc. In the Search box type gcc. You will see multiple expand buttons (the plus signs). Expand the Devel button.

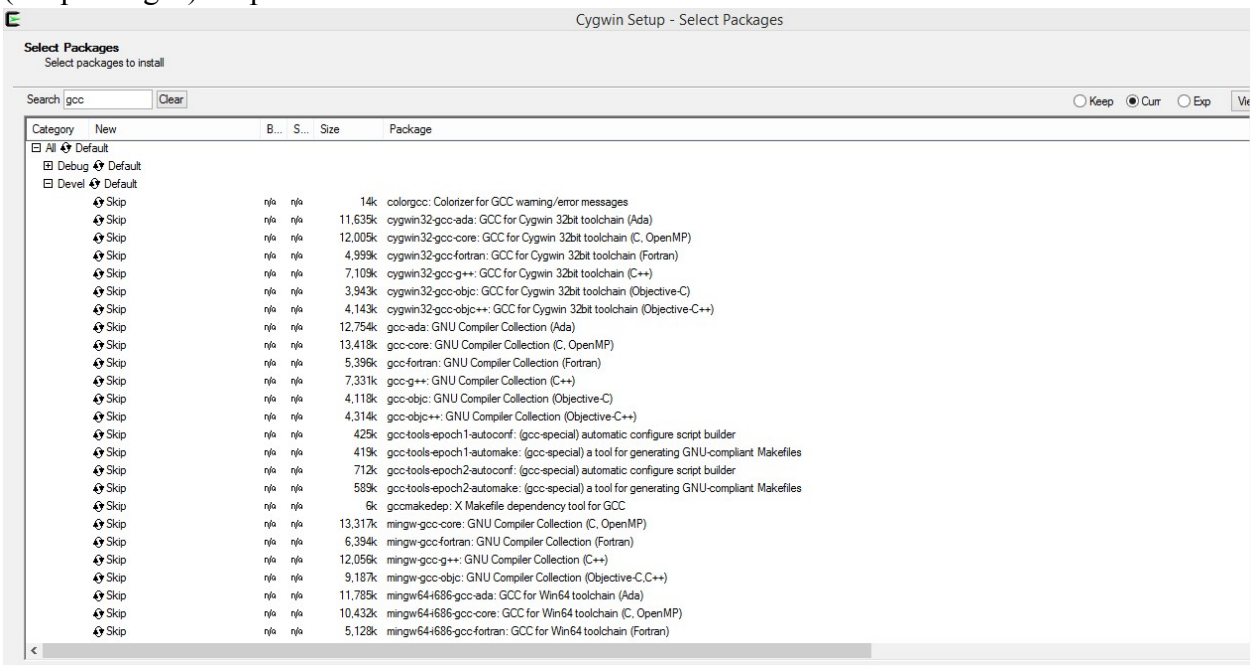

Figure 10

11- After expanding the Devel button look for "gcc-core" and "gcc-g++". Then click on Skip next to them. After you do that you should have something similar to Figure 11. The "n/a" under heading "Bin?" (left column) should be replaced with an X. We want the compiled (i.e., "Bin") version of these tools will be installed.

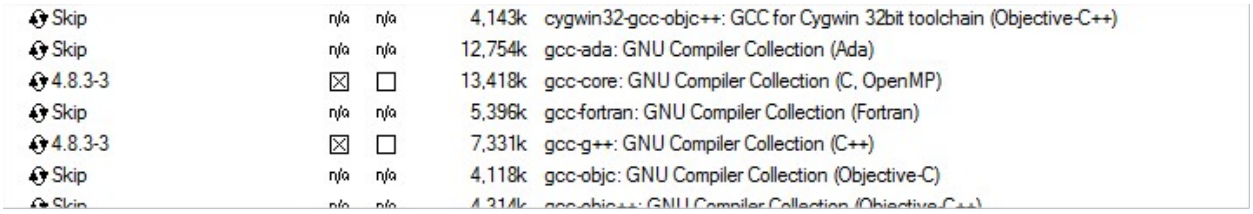

Figure 11

12- Now we will redo the same thing for make. Type make in the search box instead of gcc and then expand Devel and choose "make" by clicking on the Skip next to it. After you do that you should have something similar to Figure 12.

Figure 12

13- Again the same steps with “bison” (as shown in Figure 13).

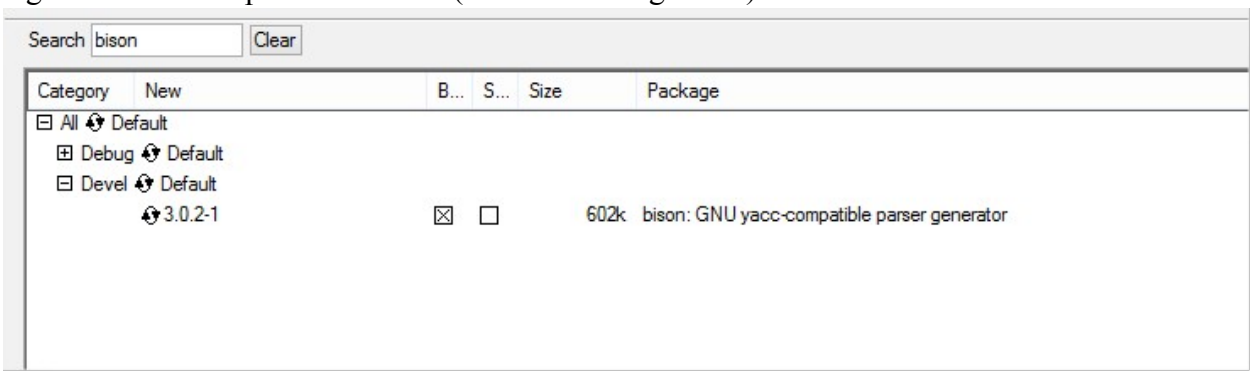

Figure 13

14- And finally adding “flex” (as shown in Figure 14).

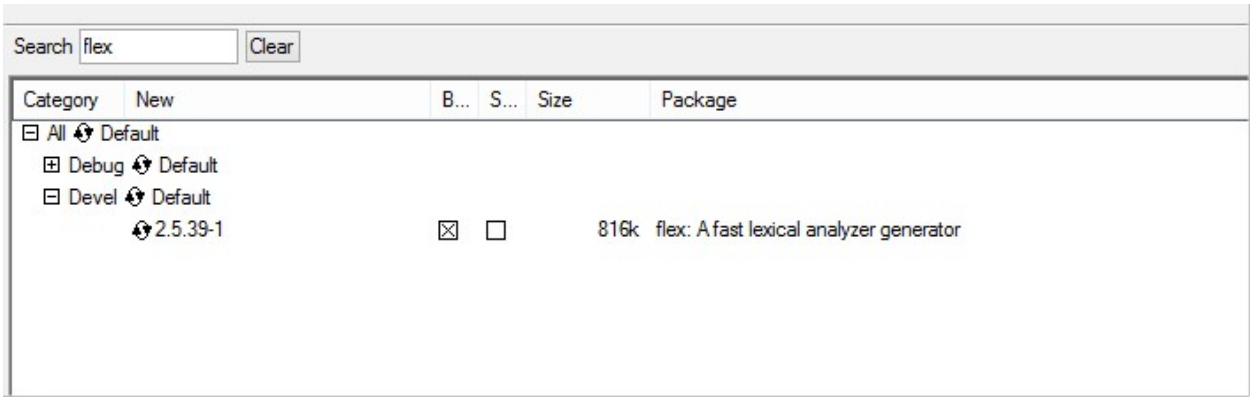

Figure 14

15- Now you will see the Resolving Dependencies window as shown in Figure 15. Make sure that “Select required packages” is on and then press next. After this step you might wait for a couple of minutes for Cygwin to finish downloading and installing.

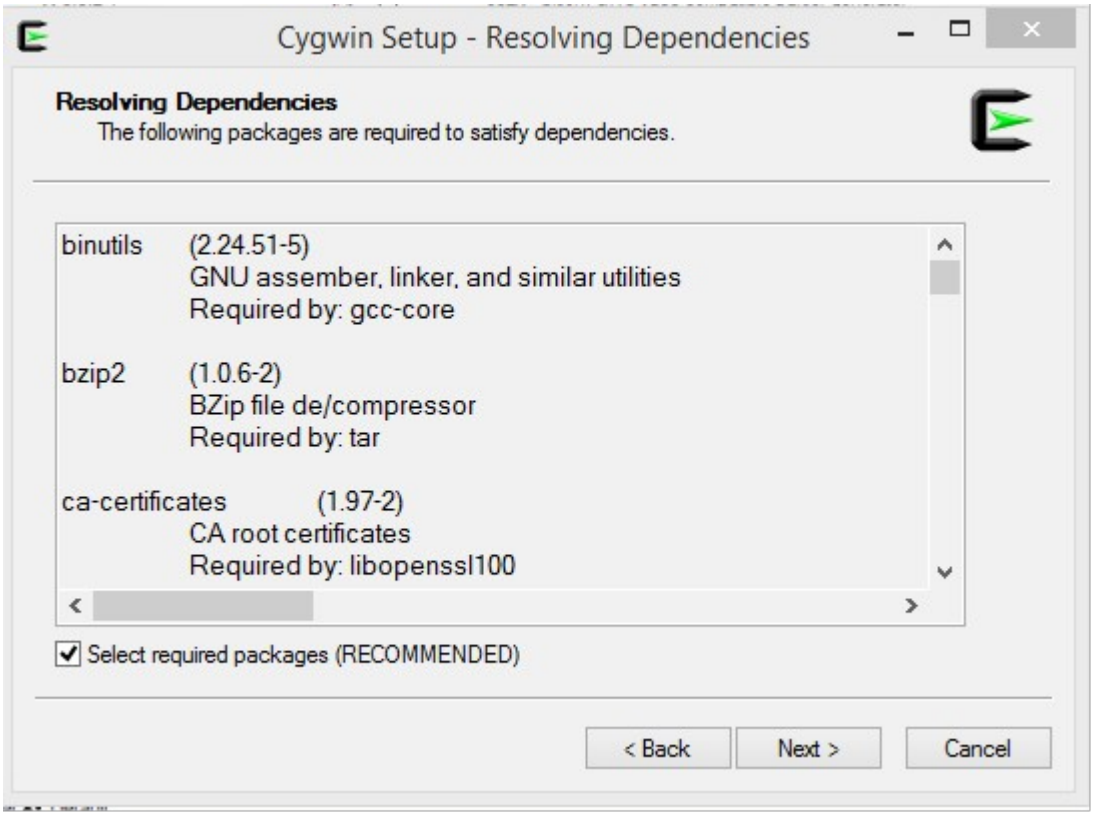

Figure 15

16- In the next window choose whether you want to add desktop and menu shortcuts for Cygwin and then press Finish.

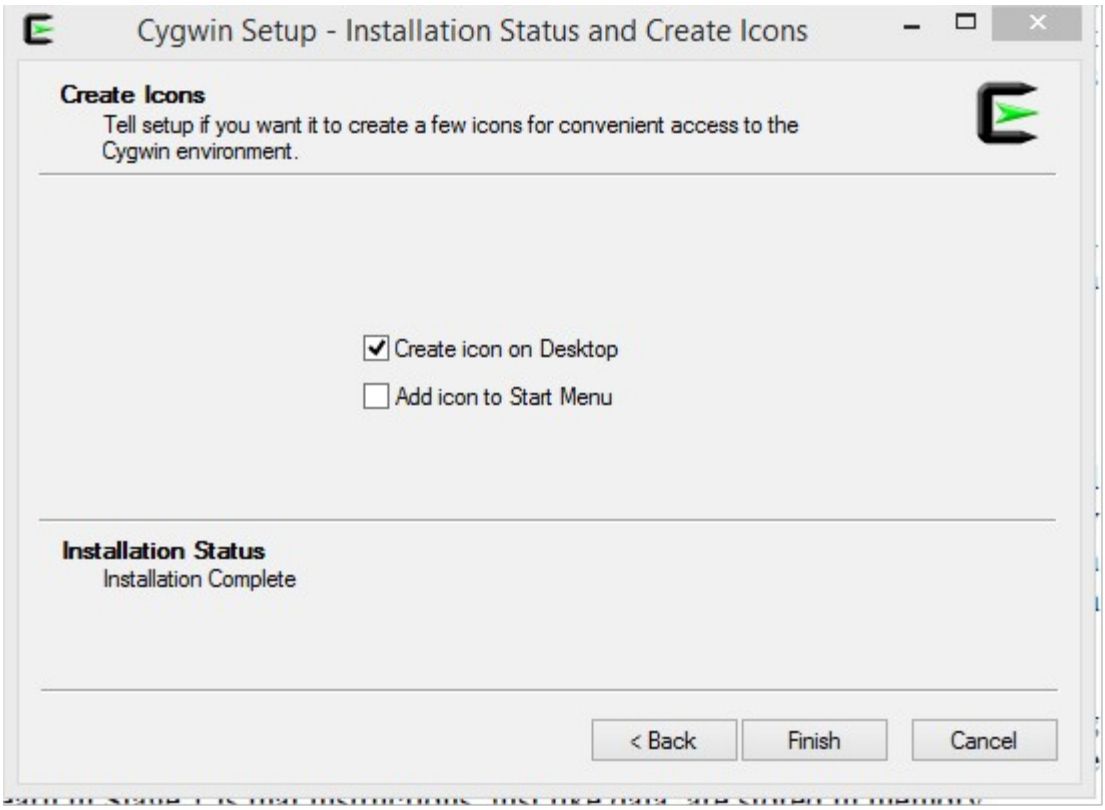

Figure 16

17- Next you can run Cygwin using the desktop shortcut or by searching for it in Window's start menu.

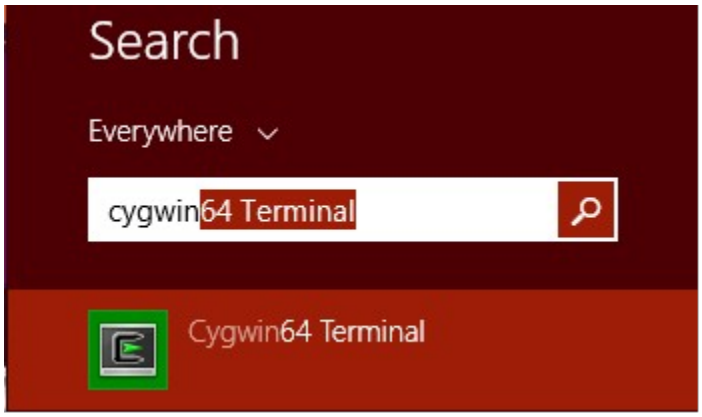

Figure 17