WORKSHEET 2

BY AHMED MAMNOON

OPERATING SYSTEM (UFCFWK-15-2)

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Lab Session 2

**Module Information:**

Module Name: Operating Systems

Module Code: UFCFWK-15-2

Module Tutor: Shancang Li, Ian Johnson, Laurence O'Brien

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Main tasks:

1. Download and build Binutils (a collection of binary tools)

2. Download and build a local version of GNU c compiler (GCC-5.3.0)

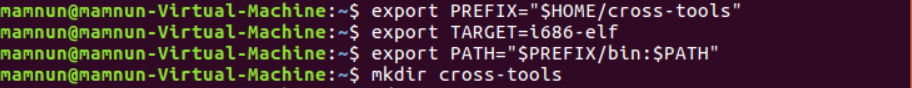
3. Use Git to fork/build/run a minimalOS

4. Modify the VGA driver to support newline/scrolling capability

5. Use Git to push your changes to your remote repo

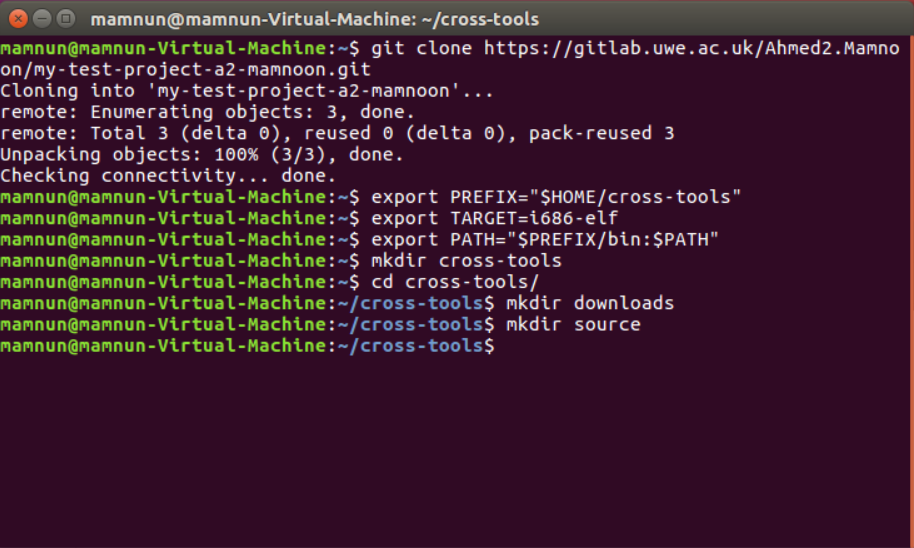
GETTING STARTED

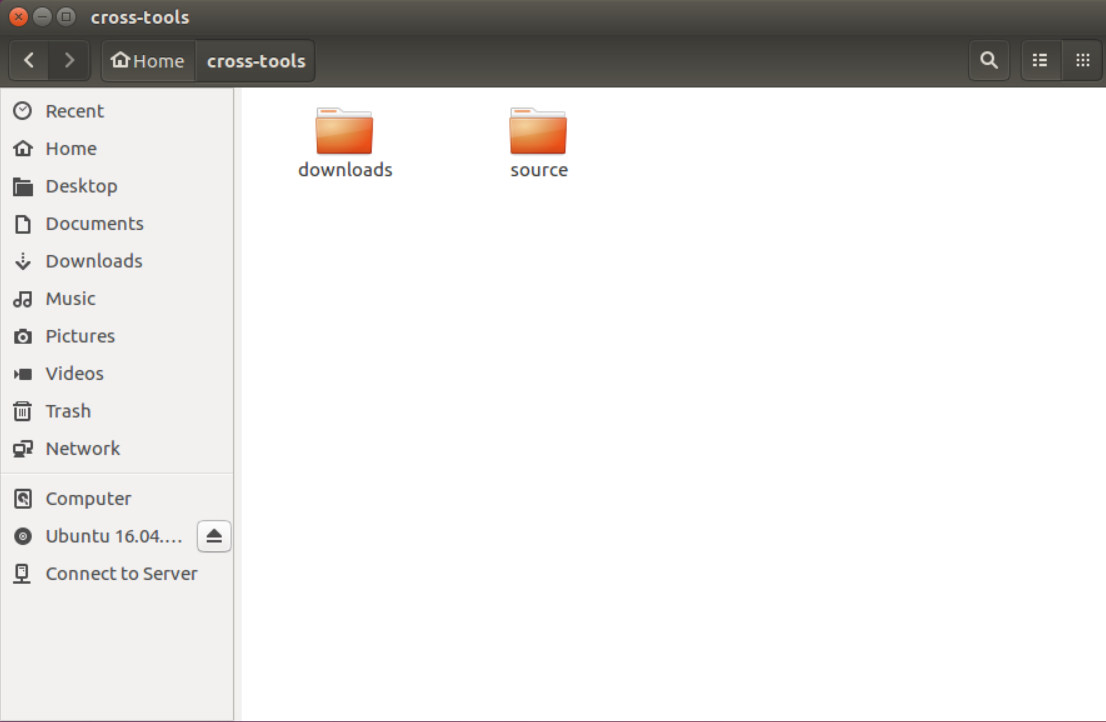
**SETTING UP THE ENVIRONMENT**

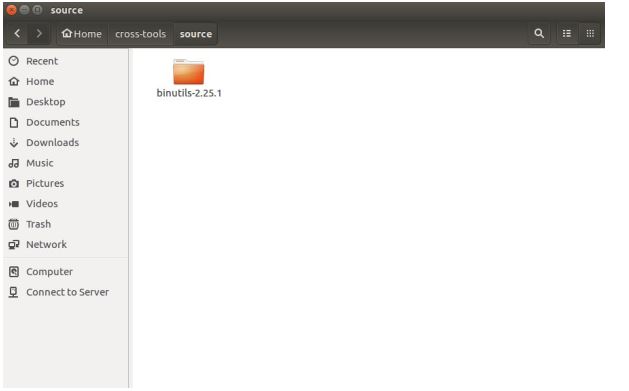
1. Creating directory for cross-tools, using the following command.

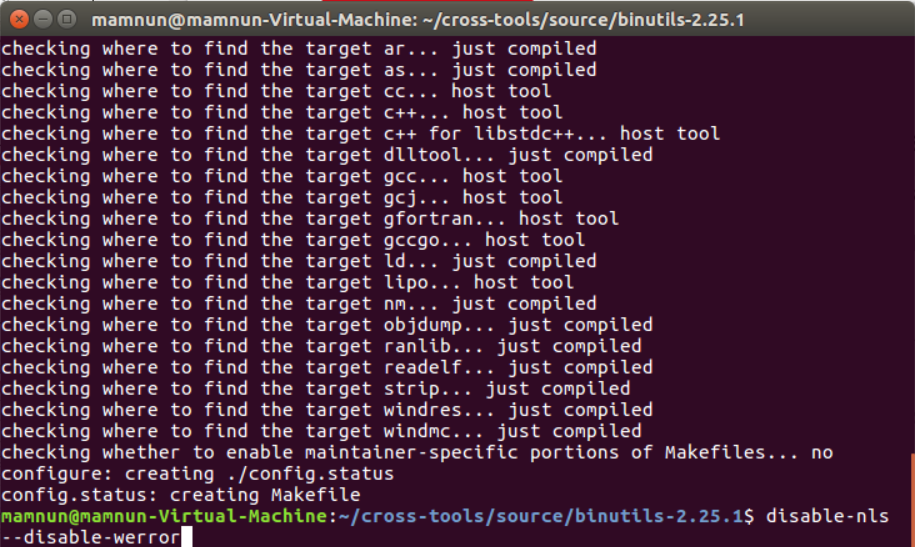
**Building Binutils (GNU Binary Utilities)**

1. Create directories $PREFIX/downloads and $PREFIX/source





1. Change directory to $PREFIX/source
2. Extracting Binutils source using command

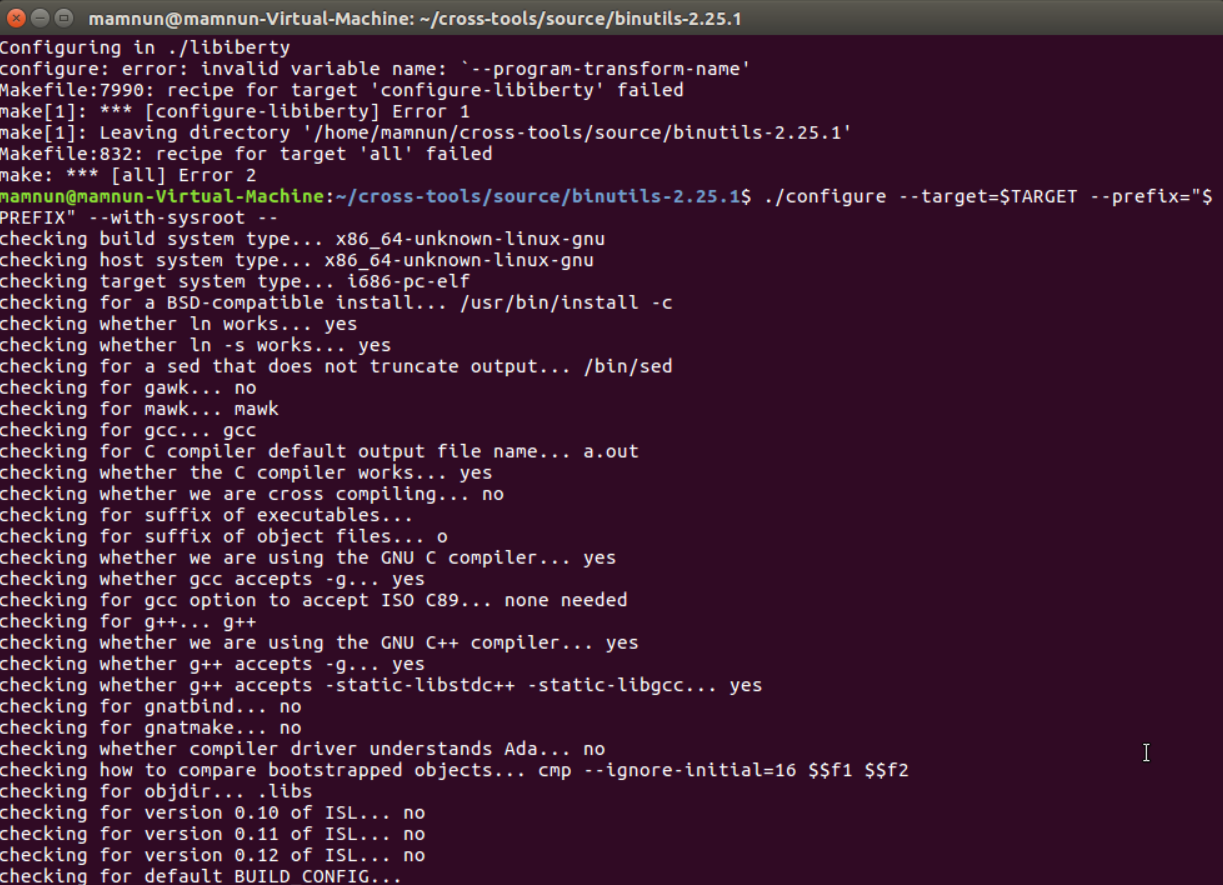
tar zxvf ../downloads/binutils-2.25.1.tar.gz

1. Change into the directory binutils-2.25.1. We now have to configure the Binutils

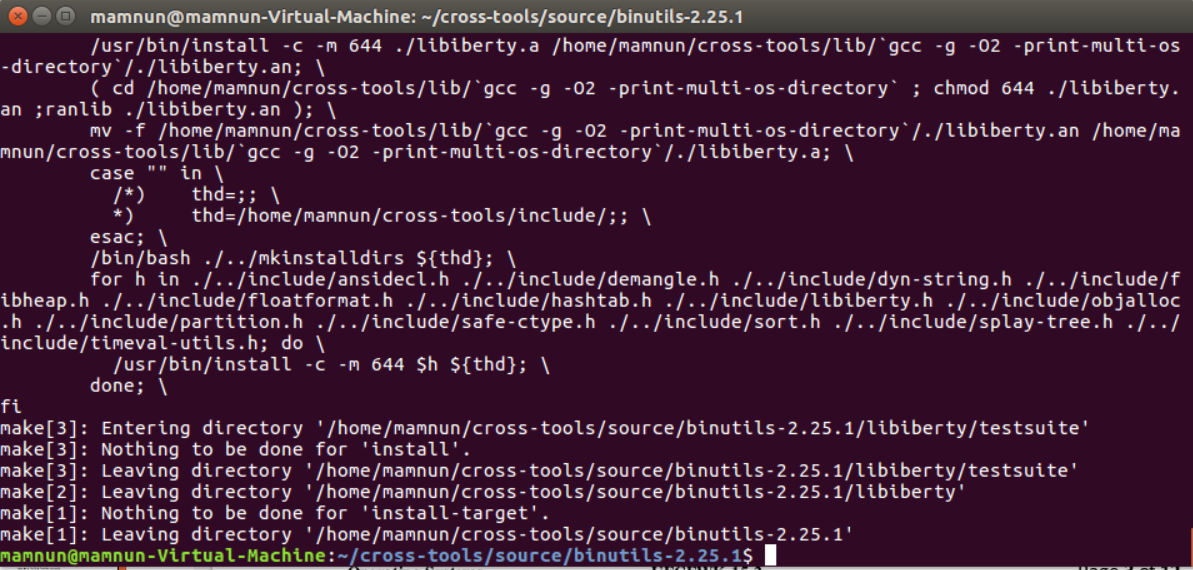
source so it can be built on the particular Linux distro.

./configure --target=$TARGET --prefix="$PREFIX" --with-sysroot --

disable-nls --disable-werror

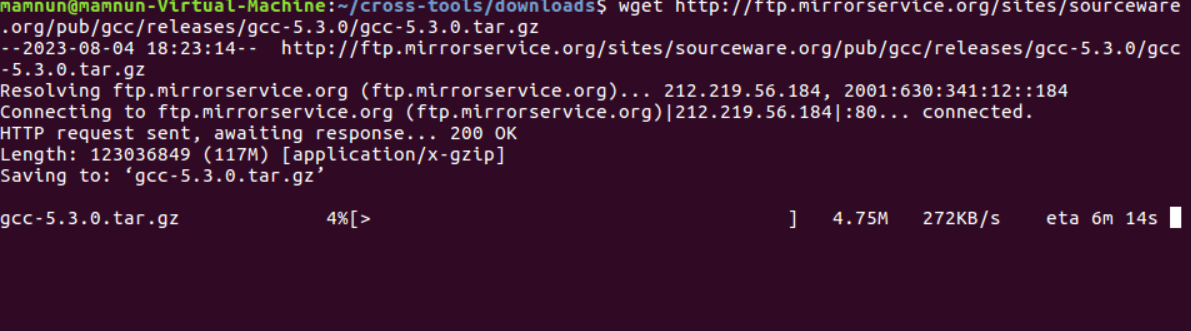


1. Now we build and install binutils with the commands, make and make install.



**GCC**

1. I have downloaded the latest version of GCC to downloads as mentioned below.



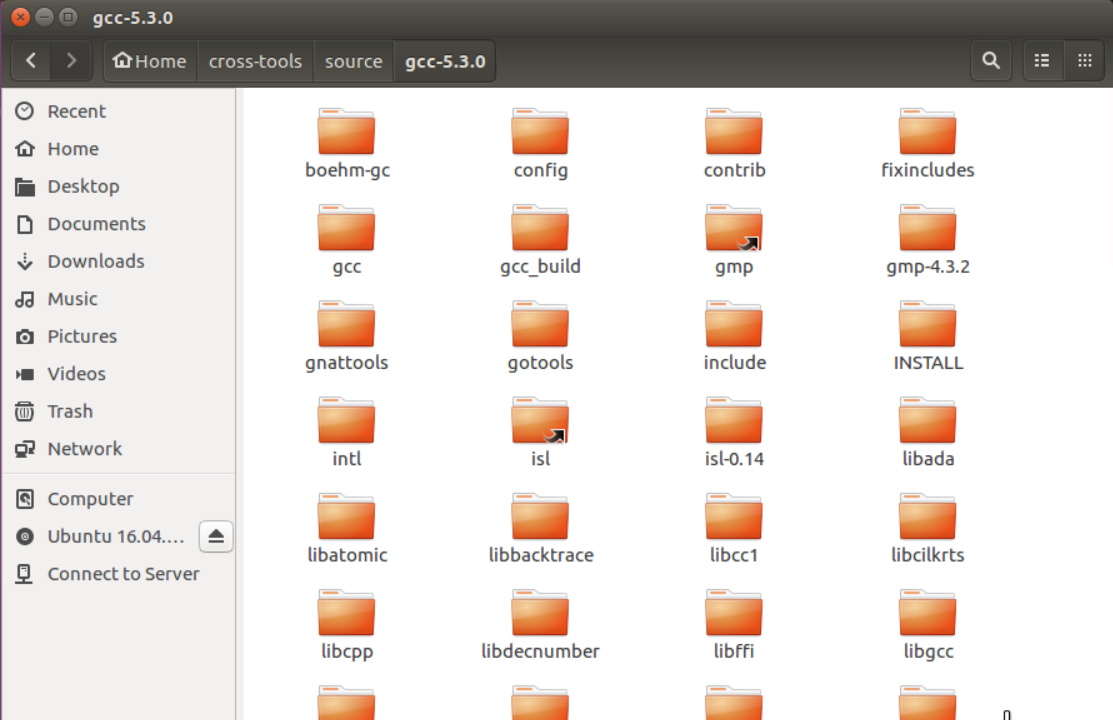
1. Create a new directory in the gcc source as follows

mkdir gcc\_build

cd gcc\_build\

../configure --target=$TARGET --prefix="$PREFIX" --disable-nls

--enable-languages=c,c++ --without-headers



1. Build and install gcc and associated libraries:

make all\_gcc

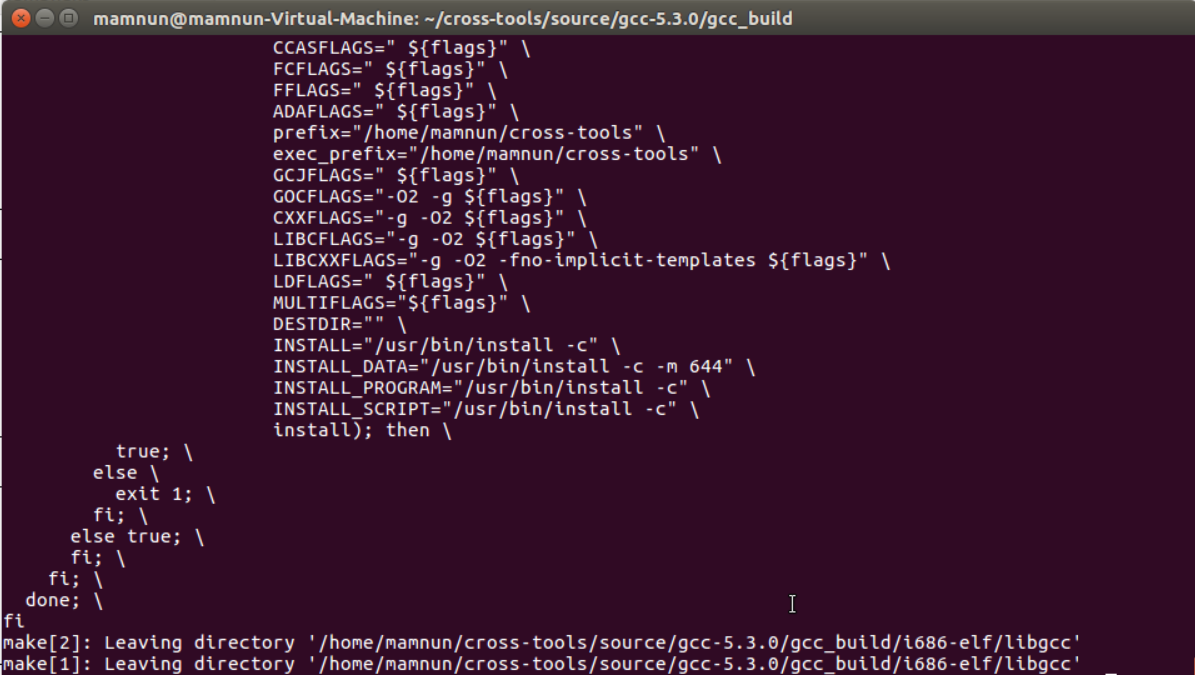


 make all-target-libgcc

make install-gcc

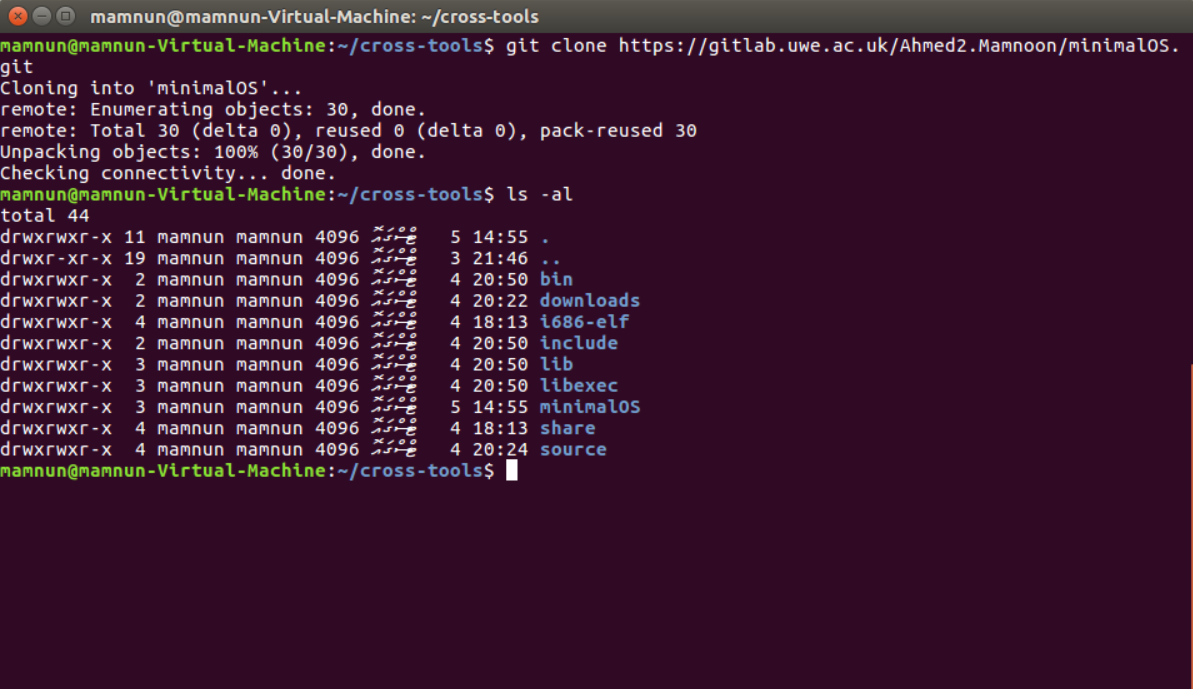


make install-target-libgcc

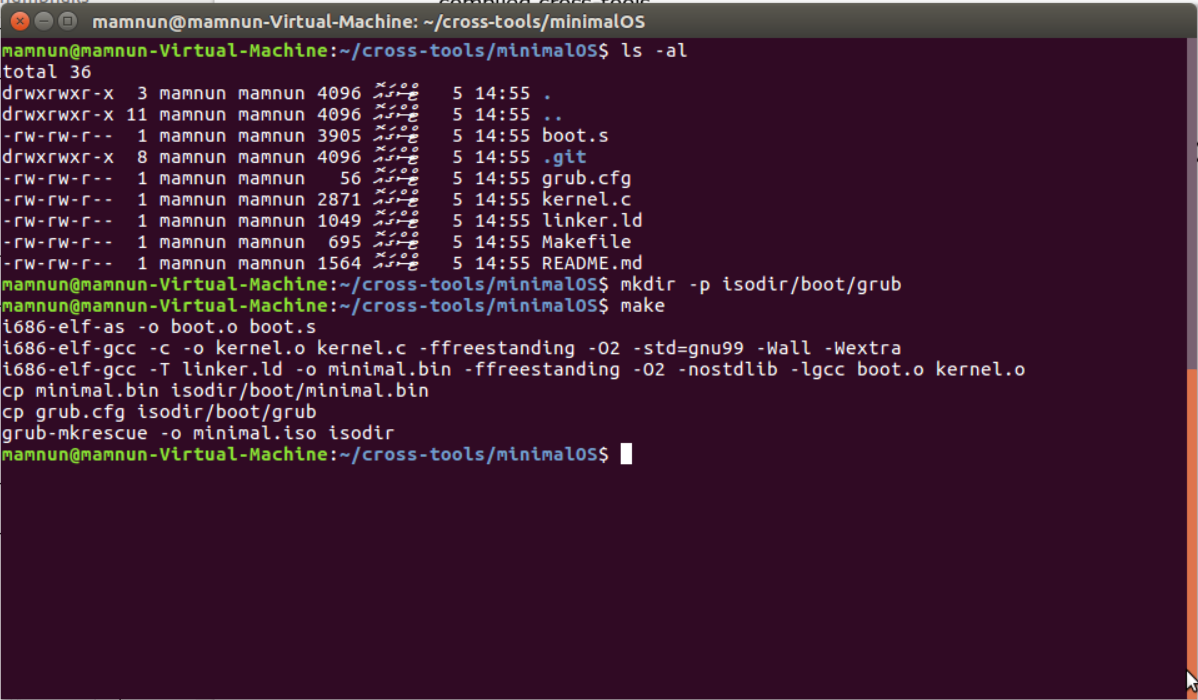


Download and build our minimal OS

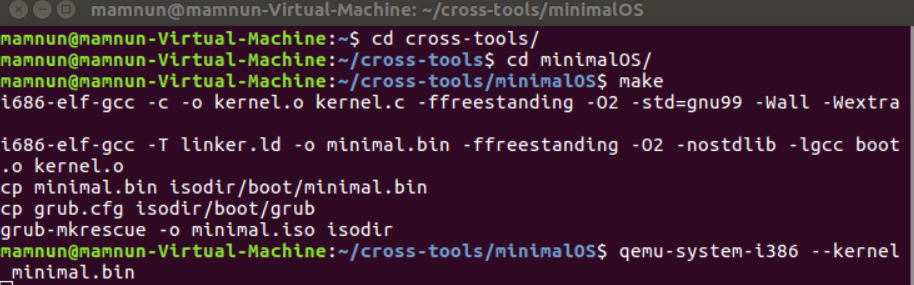
1. Change into the directory $PREFIX/minimalOS



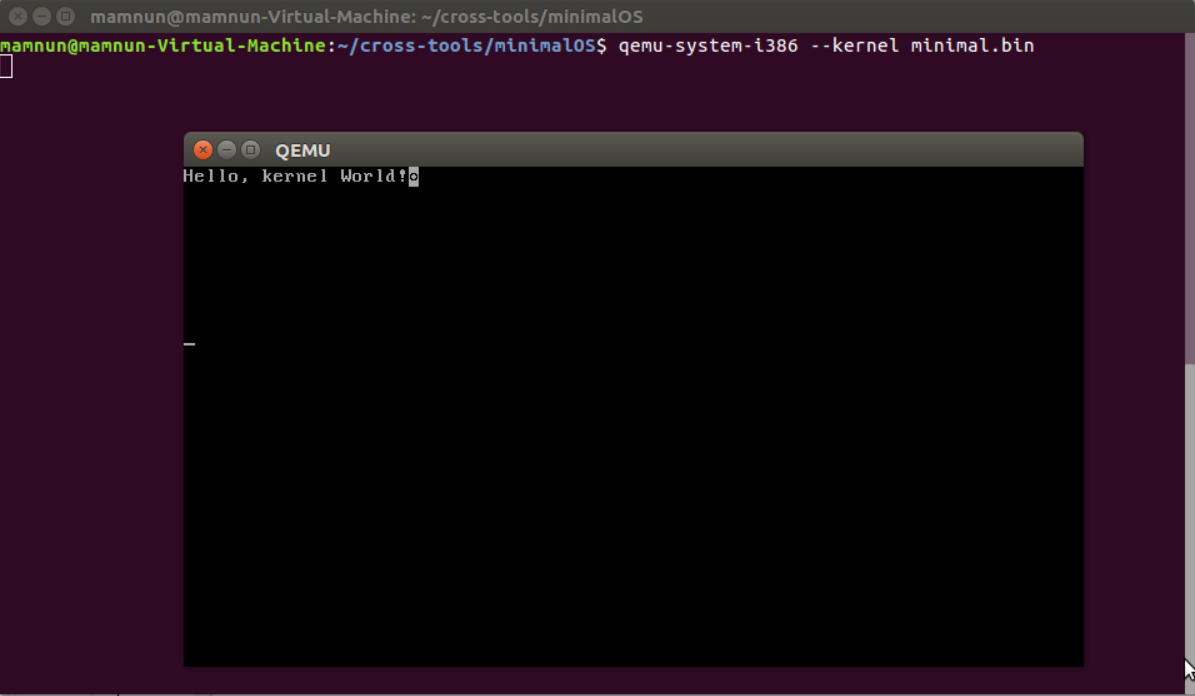
1. Creating a bootable image as follows:



1. Now build the OS by commanding “make”

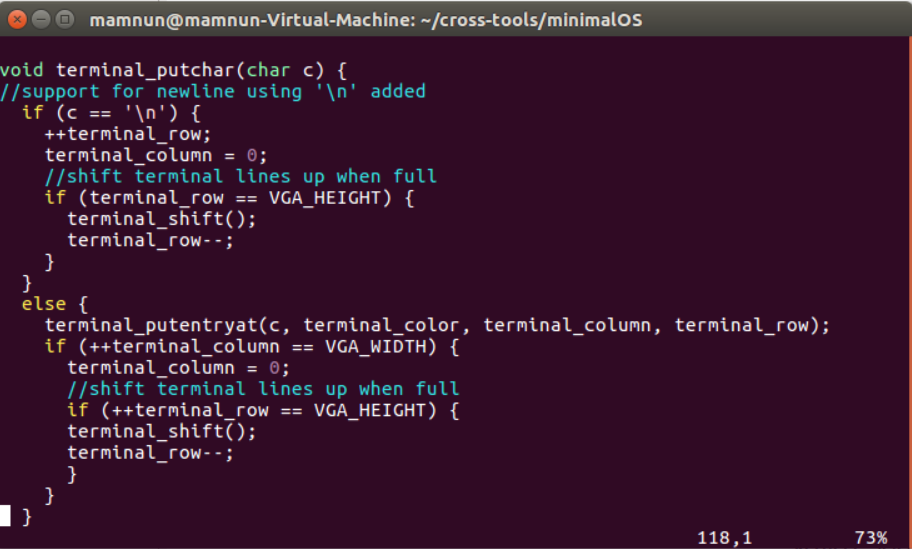


**Running our MINIMAL OS**

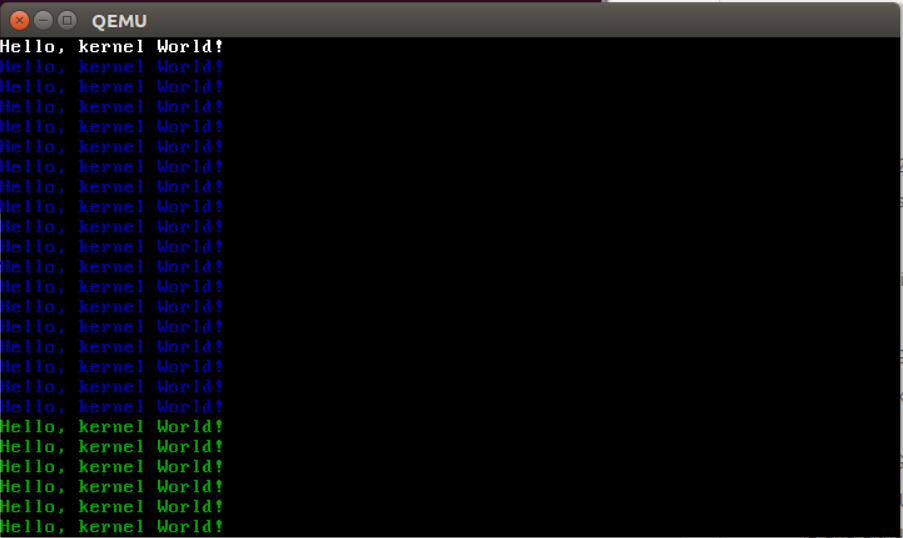


Adding additional functionality support to our VGA Driver

Here I have modified the VGA driver



Here is the result



Finally, Push it to gitlab using command “git push”