CS242 (System Software Lab): Assignment II

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Problem 1 :

In the directory name with MakeDemo1, create a Makefile that:
1. Has a dependency rule that will only compile the executable if main.c is present
2. Compiles main.c into an executable named main.
3. Has a clean rule that deletes the executable main

Follow up Commands:

https://jatina.iitg.ac.in/~asahu/cs242/makedemo1

You have to run the make and make clean command.
Makefile basics: https://www.youtube.com/watch?v=43-2t7CveRI
Tutorial makefile 2 using variable pattern comment:
https://www.youtube.com/watch?v=q7msgDa5-dc
Example: cse241 SD Lab make example.pdf

Problem 2 :

In the directory name with MakeDemo2, create a Makefile that:
1. Has a dependency rule that will only compile the executable if all required object files are present.
2. Compiles cube.o, rectangle.o, cylinder.o, circle.o, and sphere.o into an executable named shapes.
3. Has dependency rules to compile each necessary .c file into its corresponding object file.
4. Has a clean rule that deletes all object files and the executable shapes.

Follow up Commands:
https://jatina.iitg.ac.in/~asahu/cs242/makedemo2

Make - Episode 4 - Rules: https://www.youtube.com/watch?v=fyTh3r4edZs

Problem 3 :

Create a makefile using generalize variables

Suppose you have a number of files in a project. How to generalize a makefile to avoid the redundancy of commands and quickly run the code by just writing a few lines of makefile code? (Hint:You can replace the target/dependency names with the patterns $@ (automatic variable), $<, $∧, $? etc.)

1. Use echo to print the text and variables value/text on terminal.
2. How to print the text in different colors using makefile.

Follow up Commands:

https://jatina.iitg.ac.in/~asahu/cs242/makedemo2

https://www.youtube.com/watch?v=Wt6KGlMkLz0

Make - Episode 3 - Patterns:
https://www.youtube.com/watch?v=PYtaEeMGsX8list=PLbuVyodeL1URagPxP5BZSKaI
A9G78yjindex=3pbjreload=1

Problem 4 :

Uses of Macro in makefile

In the third directory (download contents of makedemo3), create a Makefile that
1. Makes use of the macro LIBS for the library and header file path.
2. Using the macro stated above, compiles the file lib driver.c into an executable named lib driver by linking to the libfoo.a and libbar.a libraries and foo.h and bar.h header file contained in another directory
3. Has a clean rule that deletes the executable lib driver.

Follow up Commands: Make - Episode 5 - Macros:

https://jatina.iitg.ac.in/~asahu/cs242/makedemo3

https://www.youtube.com/watchv=buxd7FcyAU4index=5list=PLbuVyodeL1URagPxP5BZ
SKaI A9G78yj

Problem 5 :

Uses of Macro in makefile

In the 4th directory another demo (download contents of makedemo5), create a Makefile that
1. Makes use of the header file path (include).
2. Using the macro stated above, compiles the file listprimes.c into an executable
3. Has a clean rule that deletes the executable.

Follow up Commands: Make - Episode 5 - Macros:

https://jatina.iitg.ac.in/~asahu/cs242/makedemo4

https://www.youtube.com/watchv=buxd7FcyAU4index=5list=PLbuVyodeL1URagPxP5BZ
SKaI A9G78yj

Problem 6 :

Run multiple makefiles through a single makefile

In the MakeDemo5 directory, create a Makefile that:

1. Makes use of two macros LIBS and EXES that correspond to the library and header file path and executables in two sepeate makefiles.]
2. Combines the three previous Makefiles (Problem 3 and Problem 5) into a single Makefile that can compile the three executables with a single make command.
3. Has a clean rule that deletes all executables and object files.
4. Has comments explaining each macro, rule, and dependency.

Problem 7 :

Uses of conditions and for loops in makefile

1. Part1: Create a make file using if else conditions
2. Part2: Create a make file that will use for loop

   Follow up Commands:
   You may refer the syntax from the tutorial: cse241 SD Lab make tutorial

Problem 8 :

Uses of system include file and library to comile file, OpenGL graphics exmaple
install gl if it is not installed in your system by
$sudo apt-get install libglu1-mesa-dev freeglut3-dev mesa-common-dev
many other GL examples are at https://cs.lmu.edu/~ray/notes/openglexamples/

Download   https://jatina.iitg.ac.in/~asahu/cs242/makedemo5

- Makes use of the header file path (include) /usr/include/GL/.
- Using the macro stated above, compiles the file intertrbobarm.cpp into an executable (use arrow key to operate after running the executable)
- Has a clean rule that deletes the executable.

Problem 9:

How to create your own linux device driver module

download linux kernel src directory

$sudo apt-get install linux-source

You may check the linux version you are using ($ uname -a) and get the source installed (may be like *6.8.0-39-generic*)

Download the   makedemo9   https://jatina.iitg.ac.in/~asahu/cs242/makedemo9

Go to the target of makefile and run the command one by one to see the effect

https://www.cyberciti.biz/tips/compiling-linux-kernel-module.html