CS29206: Systems Programming Lab
Spring 2025
Assignment 2
Time: 1 hour

In this assignment, you will write a makefile to perform the following operations on the source code as copied and unzipped from your desktop. DO NOT alter any file, or the directory structure by creating new directory or by deleting old directory. Specifically, you will have to do the following in order. Please follow instructions carefully.

1. Create a directory named *A2<your roll no>* under your home directory (directory you are in when you log in). For example, if your roll no. is 23CS10002, the directory should be named *A223CS10002*. All instructions after this in this assignment will use this directory name, *A223CS10002*, as example, you should interpret it as your actual directory name you will use based on your own roll no.

2. Put the downloaded *matrix.tar* file into this directory and from the command prompt execute
   tar xf matrix.tar

3. Make sure you have following files and directory:
   (a) Directory named **include containing** header files viz., *defs.h, matIO.h, matAlg.h*
   (b) Directory named **lib**: empty directory
   (c) C source files: *matAlg.c matIO.c matops.c*

   Report immediately if you do not find all of these files and directory/subdirectories.

4. Write a makefile which can be called (from the $ prompt) in three different ways as given below and when it is executed, will perform the following. **Note that no command line of any target in the makefile should directly use a command name/filename/directory name, define appropriate variables for them first.**
   (a) $*make*

      (i) Will compile all the C source files to generate corresponding object files.
      (ii) Will generate a static library file viz., *libmatrix.a*
      (iii) Change the permission of this library file so that owner can read and execute the library file, whereas group and others can only read it. Copy the static library file to the *lib* subdirectory.
      (iv) Generate the executable file with filename *matops*. The permission for *matops* is all for owner (read, write and execute)whereas read and execute permission for the group and others.

   (b) $*make library*

      Will assume the existence of the object files and combines them to a static library *libmatrix.a* to include all functions defined in *matIO.c* and *matAlg.c*. Next, to the static library *libmatrix.a*, it sets read permission for all, and additional execute permission to the owner. Finally it will move this library to *lib* subdirectory.

   (c) $*make clean*
      a. Remove all the object files and the core dump file (if any).

5. Upload only your Makefile to the moodle server within the deadline. No need to upload any other file. You are not supposed to change any downloaded files or directory structure or their file organization (including naming).