

CS475 - Assignment 0 (Practice with mat library and assignment submission)

REWARD: 110 points

DUE: Thu Feb 3 at 11PM PT

TEST DATA: [testDataA0.tar](#), [testDataA0.zip](#)

LIBRARY: [mat.tar](#), [mat.zip](#)

1 The Task

This semester I would like to do a warmup with the matrix library and the submission page. Let's do a little practice. Write a C++ program using the mat library version 7.1WX. The program will be called warmup. A lot of what you need to do is read the mat.h file for routines that will help you do this. **If your program contains a loop then you have done something wrong!**

It must do exactly this and no more:

1. Create matrices labeled A and B
2. Create a matrix labeled M of size 3×4 . It should be initialized to:

$$\begin{bmatrix} 0 & 1 & 2 & 3 \\ 4 & 5 & 6 & 7 \\ 8 & 9 & 10 & 11 \end{bmatrix}$$

3. Create a matrix labeled S of size 3×3 . It should be initialized to:

$$\begin{bmatrix} 1 & 2 & 4 \\ 2 & 2 & 3 \\ 4 & 3 & 3 \end{bmatrix}$$

4. Print S
5. Set A to S
6. Take the inverse of S and print it with the label "inverse:". Note print can take a label.
7. Print S. (Has it changed? Reread mat.h about inverse.)

8. Do a matrix multiply of A times S and print the result with each element formatted using “%12.4lg” format. Find the correct print method to use.
9. Print A
10. Do: `printf("--- \n");`
11. Read a matrix into A from stdin.
12. Print A
13. Print M
14. Do: `printf("--- \n");`
15. Set B to M times A and print it with the label "result:".
16. Print B
17. Do: `printf("--- \n");`
18. Set B to A transpose
19. Print B
20. Print B times (B transpose). Note there is a helpful method for multiplying by the transpose of a matrix.

The test data and example output can be found in testDataA0.tar or testDataA0.zip. The input file is in the format to be read into a matrix using the correct I/O method.

Your code must compile and run on the CS test machine (a Linux machine). If it does not compile or fails to run (e.g. gets seg faults) or in other ways produces no output that is a very serious fault and will result in a near zero score. In 4xx/5xx CS classes your code should at least run and produce reasonable output.

You will be graded on getting your output to match character by character the expected output for the problem. Any differences may count against you.

2 Submission

Tar up **all** the code necessary along with a makefile to build the program named **warmup** that reads the sample data from stdin as described above. The tar must also contain the library files: mat.h, mat.cpp, rand.cpp, rand.h.

Homework should be submitted as **uncompressed** tar file to the homework submission page linked from the class web page. You can submit as many times as you like. **The LAST file you submit BEFORE the deadline will be the one graded.** For all submissions you will receive email at your uidaho.edu mail address giving you some automated feedback on the unpacking and compiling and running of code and possibly some other things that can be autotested.

Have fun.