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ECE 330

Homework 2

Repository for Program Files: <https://github.com/gianorozco/ECE330HW2>

Outputs of the following programs:

Static Matrix, Datatype: Double

```
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ make -f makefile1
gcc test_static.o matrix_static.o -o run_static
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ ./run_static

Matrix a:

  1.000  2.000
  3.000  4.000

Matrix b:

  1.000  2.000
  3.000  4.000

a+b:

  2.000  4.000
  6.000  8.000

transpose of a and b

  1.000  3.000
  2.000  4.000

  1.000  3.000
  2.000  4.000
```

Static Matrix, Datatype: Integer

```
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ vim matrix_staticlib.h
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ make -f makefile1
gcc -c test_static.c
gcc -c matrix_static.c
gcc test_static.o matrix_static.o -o run_static
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ ./run_static

Matrix a:

1 2
3 4

Matrix b:

1 2
3 4

a+b:

2 4
6 8

transpose of a and b

1 3
2 4

1 3
2 4
```

Dynamic Matrix, Datatype: Double

```
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ make -f makefile2
gcc -c test_dynamic.c
gcc test_dynamic.o matrix_dynamic.o -o run_dynamic
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ ./run_dynamic

Matrix a:

  1.000  2.000
  3.000  4.000

Matrix b:

  1.000  2.000
  3.000  4.000

a+b:
transpose of a and b

  1.000  3.000
  2.000  4.000

  1.000  3.000
  2.000  4.000
```

Dynamic Matrix, Datatype: Integer

```
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ vim matrix_dynamiclib.h
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ make -f makefile2 clean
rm *.o
rm run_dynamic
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ make -f makefile2
gcc -c test_dynamic.c
cc -c -o matrix_dynamic.o matrix_dynamic.c
gcc test_dynamic.o matrix_dynamic.o -o run_dynamic
gorozco@LAPTOP-0MOGC64A:/mnt/c/Users/goroz/Desktop/ECE330HW2$ ./run_dynamic

Matrix a:
1 2
3 4

Matrix b:
1 2
3 4

a+b:
transpose of a and b

1 3
2 4

1 3
2 4
```

Note: Changing the datatype of the matrix risks breaking the dynamic program. Specifically, it sets all the members of the matrix to some unexpected value when the data implemented says otherwise.

The reason for this isn't due to the `#define` preprocessor directive but because the recompiling of code via makefile was altering the values; the files created by the makefile were not cleaned prior to recompiling

This issue was fixed by cleaning the '.o' files after a modification has been made to the program code so you can recompile with the appropriate makefile.

Alternatively, you can instead opt to not use the define preprocessor directive in the header file as a means of implementing it into the print function in 'matrix_dynamic.c', but the reason as to why this works is unclear.