CME 213 Homework 1

Compiling without errors

```
(base) weihongho@DN525eqp starter-code % ls
Makefile        main_q1.cpp     main_q2.cpp     main_q3.cpp     main_q4.cpp     matrix.hpp
(base) weihongho@DN525eqp starter-code % make
g++ -std=c++11 -g -Wall -Wextra -pedantic main_q1.cpp -o main_q1
g++ -std=c++11 -g -Wall -Wextra -pedantic main_q2.cpp -o main_q2
g++ -std=c++11 -g -Wall -Wextra -pedantic main_q3.cpp -o main_q3
g++ -std=c++11 -g -Wall -Wextra -pedantic main_q4.cpp -o main_q4
```

Question 1.

```
(base) weihongho@DN525eqp starter-code % ./main_q1
Default constructor test passed.
Empty matrix test passed.
Negative size constructor test passed.
L0Norm test passed.
Initialization and retrieval tests passed.
Out of bounds test passed.
Stream operator test passed.
```

Q2.

Q: Please complete the code given in `main_q2.cpp` and demonstrate how this can be done.

Let SparseMatrix and ToeplitzMatrix inherit from Matrix base class

```
(base) weihongho@DN525eqp starter-code % ./main_q2
sparse
toeplitz
```

Q3.

```
(base) weihongho@DN525eqp hw1 % ./main_q3
Range test passed.
Number of elements in range [-1, 1]: 6885 (est. = 6830)
```

Q4.

    a. Use std::transform
    b. Use std::all_of
    c. Use std::sort , with a special lambda for sorting
    d. Use list.sort with special sorting

```
(base) weihongho@DN525eqp hw1 % ./main_q4
Q4a: PASSED
Q4b: PASSED
Q4b: PASSED
Q4b: PASSED
Q4b: PASSED
Q4c: PASSED
Q4d empty list: PASSED
Q4d: PASSED
```

Submission

```
weihongh@cardinal3:~/cme213hw1$ /afs/ir.stanford.edu/class/cme213/script/submit.py hw1 .
[Submission for assignment 'hw1' as user 'weihongh'
Attempt 1/10
Time stamp: 2022-04-05 16:59
List of files being copied:
    ./main_q1.cpp        [4326 bytes]
    ./main_q2.cpp        [1491 bytes]
    ./main_q3.cpp        [1967 bytes]
    ./main_q4.cpp        [4680 bytes]
    ./matrix.hpp         [4040 bytes]

Your files were copied successfully.
Directory where files were copied: /afs/ir.stanford.edu/class/cme213/submissions/hw1/weihongh/1
List of files in this directory:
    main_q1.cpp  [4326 bytes]
    main_q2.cpp  [1491 bytes]
    main_q3.cpp  [1967 bytes]
    main_q4.cpp  [4680 bytes]
    matrix.hpp   [4040 bytes]
    metadata     [126 bytes]
```