

---

# CME 213 - Parallel Computing

## homework 1

---

**Leon H. Kloker**

Institute for Computational and Mathematical Engineering  
CME 213, Stanford University  
leonkl@stanford.edu

### Exercise 1

Output of running the tests:

```
$ ./main_q1
Running main() from ./googletest-main/googletest/src/gtest_main.cc
[=====] Running 4 tests from 1 test suite.
[-----] Global test environment set-up.
[-----] 4 tests from testMatrix
[ RUN ] testMatrix.symmetricTest
[ OK ] testMatrix.symmetricTest (0 ms)
[ RUN ] testMatrix.symmetricPrint
0 1 2 3 4
1 0 0 0 0
2 0 0 0 0
3 0 0 0 0
4 0 0 0 0
[ OK ] testMatrix.symmetricPrint (0 ms) [ RUN ] testMatrix.diagonalTest [ OK ]
testMatrix.diagonalTest (0 ms) [ RUN ] testMatrix.diagonalPrint 0 0 0 0 0
0 1 0 0 0
0 0 2 0 0
0 0 0 3 0
0 0 0 0 4
[ OK ] testMatrix.diagonalPrint (0 ms) [-----] 4 tests from testMatrix (0 ms
total)
[-----] Global test environment tear-down
[=====] 4 tests from 1 test suite ran. (0 ms total)
[ PASSED ] 4 tests.
```

### Exercise 2

Output of running the tests:

```
$ ./main_q2
Running main() from ./googletest-main/googletest/src/gtest_main.cc
[=====] Running 6 tests from 1 test suite.
[-----] Global test environment set-up.
[-----] 6 tests from testMatrix
[ RUN ] testMatrix.mnmxmn
[ OK ] testMatrix.mnmxmn (0 ms)
[ RUN ] testMatrix.1nmxmn
```

```

[ OK ] testMatrix.1nxmn (0 ms)
[ RUN ] testMatrix.mnxml
[ OK ] testMatrix.mnxml (0 ms)
[ RUN ] testMatrix.11xmn
[ OK ] testMatrix.11xmn (0 ms)
[ RUN ] testMatrix.mnx11
[ OK ] testMatrix.mnx11 (0 ms)
[ RUN ] testMatrix.print
0 0 0 0
0 1 2 3
0 2 4 6
[ OK ] testMatrix.print (0 ms)
[-----] 6 tests from testMatrix (0 ms total)
[-----] Global test environment tear-down
[=====] 6 tests from 1 test suite ran. (0 ms total)
[ PASSED ] 6 tests.

```

### Exercise 3

Output:

```

$ ./main_q3
sparse toeplitz

```

### Exercise 4

Output:

```

$ ./main_q4
Range test passed.
Number of elements in range [-1, 1]: 6843 (est. = 6830)

```

### Exercise 5

Output:

```

$ ./main_q5
Q5a: PASSED
Q5b: PASSED
Q5b: PASSED
Q5b: PASSED
Q5b: PASSED
Q5b: PASSED
Q5c: PASSED
Q5d empty list: PASSED
Q5d: PASSED

```