Name: *Dominic MacIsaac*

Assignment: 7

Submission and Compilation

- Builds and Compiles Successfully

Complete & Correct: 30 / 30

- Unit Test Results:

```
==344876== Memcheck, a memory error detector
==344876== Copyright (C) 2002-2017, and GNU GPL'd, by Julian Seward et al.
==344876== Using Valgrind-3.15.0 and LibVEX; rerun with -h for copyright info
==344876== Command: ./hw7_test
==344876==
[==========] Running 14 tests from 1 test suite.
[----------] Global test environment set-up.
[----------] 14 tests from BasicBSTMapTests
[ RUN      ] BasicBSTMapTests.EmptyCheck
[       OK ] BasicBSTMapTests.EmptyCheck (8 ms)
[ RUN      ] BasicBSTMapTests.InsertAndContainsCheck
[       OK ] BasicBSTMapTests.InsertAndContainsCheck (5 ms)
[ RUN      ] BasicBSTMapTests.RValueAccessCheck
[       OK ] BasicBSTMapTests.RValueAccessCheck (4 ms)
[ RUN      ] BasicBSTMapTests.LValueAccessCheck
[       OK ] BasicBSTMapTests.LValueAccessCheck (3 ms)
[ RUN      ] BasicBSTMapTests.EraseCheck
[       OK ] BasicBSTMapTests.EraseCheck (21 ms)
[ RUN      ] BasicBSTMapTests.KeyRangeCheck
[       OK ] BasicBSTMapTests.KeyRangeCheck (13 ms)
[ RUN      ] BasicBSTMapTests.SortedKeyCheck
[       OK ] BasicBSTMapTests.SortedKeyCheck (4 ms)
[ RUN      ] BasicBSTMapTests.InvalidKeyCheck
[       OK ] BasicBSTMapTests.InvalidKeyCheck (32 ms)
[ RUN      ] BasicBSTMapTests.DestructorCheck
[       OK ] BasicBSTMapTests.DestructorCheck (4 ms)
[ RUN      ] BasicBSTMapTests.CopyConstructorCheck
[       OK ] BasicBSTMapTests.CopyConstructorCheck (6 ms)
[ RUN      ] BasicBSTMapTests.CopyAssignmentCheck
[       OK ] BasicBSTMapTests.CopyAssignmentCheck (10 ms)
[ RUN      ] BasicBSTMapTests.MoveConstructorCheck
[       OK ] BasicBSTMapTests.MoveConstructorCheck (6 ms)
[ RUN      ] BasicBSTMapTests.MoveAssignmentCheck
[       OK ] BasicBSTMapTests.MoveAssignmentCheck (9 ms)
[ RUN      ] BasicBSTMapTests.HeightCheck
[       OK ] BasicBSTMapTests.HeightCheck (6 ms)
[----------] 14 tests from BasicBSTMapTests (137 ms total)

[----------] Global test environment tear-down
[==========] 14 tests from 1 test suite ran. (163 ms total)
[  PASSED  ] 14 tests.
==344876==
==344876== HEAP SUMMARY:
==344876==     in use at exit: 0 bytes in 0 blocks
==344876==   total heap usage: 578 allocs, 578 frees, 136,074 bytes allocated
==344876==
==344876== All heap blocks were freed -- no leaks are possible
==344876==
==344876== For lists of detected and suppressed errors, rerun with: -s
==344876== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

- Performance Test Results:

```
# All times in milliseconds (msec)
# Column 1 = input data size
# Column 5 = bst map insert shuffled
```

```
# Column 9 = bst map erase shuffled
# Column 13 = bst map contains shuffled
# Column 17 = bst map find range shuffled
# Column 21 = bst map sorted keys shuffled
# Column 22 = bst map height shuffled
# Column 23 = log base 2 of input size
0 0.00 0.00 0.00 0.00 0.00 1 0
15000 0.00 0.00 0.00 0.00 0.31 129 14
30000 0.00 0.01 0.00 0.01 0.60 246 15
45000 0.00 0.00 0.00 0.02 0.96 363 16
60000 0.01 0.01 0.00 0.03 1.22 480 16
75000 0.01 0.02 0.01 0.04 1.93 598 17
90000 0.01 0.01 0.01 0.04 2.33 715 17
105000 0.02 0.02 0.01 0.08 3.19 832 17
120000 0.01 0.00 0.01 0.10 4.12 949 17
135000 0.02 0.01 0.01 0.14 5.64 1066 18
150000 0.10 0.04 0.03 0.37 12.85 1184 18
11.59user 0.02system 0:11.61elapsed 99%CPU (0avgtext+0avgdata 11236maxresident)k
0inputs+8outputs (0major+2753minor)pagefaults 0swaps
```

Student-Defined Test Cases: 0 / 0

Format and Comments: 5 / 5

Discussion and Analysis: 5 / 5

Total Score: 40 / 40