

HW 7 REPORT:

WITHOUT EXCEPTIONS:

```
alvinvn@andromeda-63: ~/hw/hw7
alvinvn@andromeda-63 23:45:34 ~/hw/hw7
$ g++ main.cpp -o a.out
alvinvn@andromeda-63 23:45:43 ~/hw/hw7
$ a.out
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9     12
0      4      8     12     16
0      5     10     15     20
0      6     12     18     24
0      7     14     21     28
0      8     16     24     32
0      9     18     27     36
0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
0.00  1.00  2.00  3.00  4.00  5.00  6.00  7.00  8.00  9.00
0.00  2.00  4.00  6.00  8.00 10.00 12.00 14.00 16.00 18.00
0.00  3.00  6.00  9.00 12.00 15.00 18.00 21.00 24.00 27.00
0.00  4.00  8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00  5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00  6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00  7.00 14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
alvinvn@andromeda-63 23:45:45 ~/hw/hw7
$
```

VALGRIND WITHOUT EXCEPTIONS:

```
alvinvn@andromeda-63: ~/hw/hw7
alvinvn@andromeda-63 23:45:45 ~/hw/hw7
$ valgrind a.out
==19138== Memcheck, a memory error detector
==19138== Copyright (C) 2002-2013, and GNU GPL'd, by Julian Seward et al.
==19138== Using Valgrind-3.10.0 and LibVEX; rerun with -h for copyright info
==19138== Command: a.out
==19138==
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9     12
0      4      8     12     16
0      5     10     15     20
0      6     12     18     24
0      7     14     21     28
0      8     16     24     32
0      9     18     27     36
0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
0.00  1.00  2.00  3.00  4.00  5.00  6.00  7.00  8.00  9.00
0.00  2.00  4.00  6.00  8.00 10.00 12.00 14.00 16.00 18.00
0.00  3.00  6.00  9.00 12.00 15.00 18.00 21.00 24.00 27.00
0.00  4.00  8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00  5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00  6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00  7.00 14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
==19138==
==19138== HEAP SUMMARY:
==19138==   in use at exit: 72,704 bytes in 1 blocks
==19138==   total heap usage: 39 allocs, 38 frees, 73,976 bytes allocated
==19138==
==19138== LEAK SUMMARY:
==19138==   definitely lost: 0 bytes in 0 blocks
==19138==   indirectly lost: 0 bytes in 0 blocks
==19138==   possibly lost: 0 bytes in 0 blocks
==19138==   still reachable: 72,704 bytes in 1 blocks
==19138==   suppressed: 0 bytes in 0 blocks
==19138== Rerun with --leak-check=full to see details of leaked memory
==19138==
==19138== For counts of detected and suppressed errors, rerun with: -v
==19138== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 1 from 1)
alvinvn@andromeda-63 23:46:14 ~/hw/hw7
$
```

```

alvinvn@andromeda-63: ~/hw/hw7
$ g++ main.cpp -o a.out
alvinvn@andromeda-63 00:05:26 ~/hw/hw7
$ a.out
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9     12
0      4      8     12     16
0      5     10     15     20
0      6     12     18     24
0      7     14     21     28
0      8     16     24     32
0      9     18     27     36
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
Starting...
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
0.000.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9     12
0      4      8     12     16
0      5     10     15     20
0      6     12     18     24
0      7     14     21     28
0      8     16     24     32
0      9     18     27     36
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
Starting...
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
0.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
0      0      0      0      0
0      1      2      3      4

```

```
alvinvn@andromeda-63:~/hw/hw7
0.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9      12
0      4      8      12     16
0      5      10     15     20
0      6      12     18     24
0      7      14     21     28
0      8      16     24     32
0      9      18     27     36
0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
0.00  1.00  2.00  3.00  4.00  5.00  6.00  7.00  8.00  9.00
0.00  2.00  4.00  6.00  8.00  10.00 12.00 14.00 16.00 18.00
0.00  3.00  6.00  9.00  12.00 15.00 18.00 21.00 24.00 27.00
0.00  4.00  8.00  12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00  5.00  10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00  6.00  12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00  7.00  14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
Starting...
0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
0.00  1.00  2.00  3.00  4.00  5.00  6.00  7.00  8.00  9.00
0.00  2.00  4.00  6.00  8.00  10.00 12.00 14.00 16.00 18.00
0.00  3.00  6.00  9.00  12.00 15.00 18.00 21.00 24.00 27.00
0.00  4.00  8.00  12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00  5.00  10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00  6.00  12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00  7.00  14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
0.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9      12
0      4      8      12     16
0      5      10     15     20
0      6      12     18     24
0      7      14     21     28
0      8      16     24     32
0      9      18     27     36
0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
0.00  1.00  2.00  3.00  4.00  5.00  6.00  7.00  8.00  9.00
0.00  2.00  4.00  6.00  8.00  10.00 12.00 14.00 16.00 18.00
0.00  3.00  6.00  9.00  12.00 15.00 18.00 21.00 24.00 27.00
0.00  4.00  8.00  12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00  5.00  10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00  6.00  12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00  7.00  14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
Starting...
0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00  0.00
0.00  1.00  2.00  3.00  4.00  5.00  6.00  7.00  8.00  9.00
0.00  2.00  4.00  6.00  8.00  10.00 12.00 14.00 16.00 18.00
0.00  3.00  6.00  9.00  12.00 15.00 18.00 21.00 24.00 27.00
0.00  4.00  8.00  12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00  5.00  10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00  6.00  12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00  7.00  14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
0.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
alvinvn@andromeda-63 00:05:29 ~/hw/hw7
$
```

VALGRIND WITH EXCEPTIONS:

```
alvinvn@andromeda-63:~/hw/hw7
$ valgrind a.out
==21268== Memcheck, a memory error detector
==21268== Copyright (C) 2002-2013, and GNU GPL'd, by Julian Seward et al.
==21268== Using Valgrind-3.10.0 and LibVEX; rerun with -h for copyright info
==21268== Command: a.out
==21268==
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9      12
0      4      8      12     16
0      5      10     15     20
0      6      12     18     24
0      7      14     21     28
0      8      16     24     32
0      9      18     27     36
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
Starting...
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
0.000.000.000.000.000.000.000.000.000.000
This is out of bounds
Done
0      0      0      0      0
0      1      2      3      4
0      2      4      6      8
0      3      6      9      12
0      4      8      12     16
0      5      10     15     20
0      6      12     18     24
0      7      14     21     28
0      8      16     24     32
0      9      18     27     36
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
Starting...
0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00   0.00
0.00   1.00   2.00   3.00   4.00   5.00   6.00   7.00   8.00   9.00
0.00   2.00   4.00   6.00   8.00   10.00  12.00  14.00  16.00  18.00
0.00   3.00   6.00   9.00   12.00  15.00  18.00  21.00  24.00  27.00
0.00   4.00   8.00   12.00  16.00  20.00  24.00  28.00  32.00  36.00
0.00   5.00   10.00  15.00  20.00  25.00  30.00  35.00  40.00  45.00
0.00   6.00   12.00  18.00  24.00  30.00  36.00  42.00  48.00  54.00
0.00   7.00   14.00  21.00  28.00  35.00  42.00  49.00  56.00  63.00
0.000.000.000.000.000.000.000.000.000.000
```

alvinvn@andromeda-63:~/hw/hw7

```
0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00
0.00 3.00 6.00 9.00 12.00 15.00 18.00 21.00 24.00 27.00
0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00 7.00 14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
Starting...
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00
0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00
0.00 3.00 6.00 9.00 12.00 15.00 18.00 21.00 24.00 27.00
0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00 7.00 14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
0.000.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
0 0 0 0 0
0 1 2 3 4
0 2 4 6 8
0 3 6 9 12
0 4 8 12 16
0 5 10 15 20
0 6 12 18 24
0 7 14 21 28
0 8 16 24 32
0 9 18 27 36
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00
0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00
0.00 3.00 6.00 9.00 12.00 15.00 18.00 21.00 24.00 27.00
0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00 7.00 14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
Starting...
0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00 0.00
0.00 1.00 2.00 3.00 4.00 5.00 6.00 7.00 8.00 9.00
0.00 2.00 4.00 6.00 8.00 10.00 12.00 14.00 16.00 18.00
0.00 3.00 6.00 9.00 12.00 15.00 18.00 21.00 24.00 27.00
0.00 4.00 8.00 12.00 16.00 20.00 24.00 28.00 32.00 36.00
0.00 5.00 10.00 15.00 20.00 25.00 30.00 35.00 40.00 45.00
0.00 6.00 12.00 18.00 24.00 30.00 36.00 42.00 48.00 54.00
0.00 7.00 14.00 21.00 28.00 35.00 42.00 49.00 56.00 63.00
0.000.000.000.000.000.000.000.000.000.00
This is out of bounds
Done
==21268==
==21268== HEAP SUMMARY:
==21268== in use at exit: 72,704 bytes in 1 blocks
==21268== total heap usage: 169 allocs, 168 frees, 79,403 bytes allocated
==21268==
==21268== LEAK SUMMARY:
==21268== definitely lost: 0 bytes in 0 blocks
==21268== indirectly lost: 0 bytes in 0 blocks
==21268== possibly lost: 0 bytes in 0 blocks
==21268== still reachable: 72,704 bytes in 1 blocks
==21268== suppressed: 0 bytes in 0 blocks
==21268== Rerun with --leak-check=full to see details of leaked memory
==21268==
==21268== For counts of detected and suppressed errors, rerun with: -v
==21268== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 1 from 1)
alvinvn@andromeda-63 00:07:58 ~/hw/hw7
$
```