

hello.cpp

```
$ g++ hello.cpp
mschal@andromeda-49 01:42:17 ~/hw/hw1
$ valgrind a.out
==22122== Memcheck, a memory error detector
==22122== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==22122== Using Valgrind-3.12.0 and LibVEX; rerun with -h for copyright info
==22122== Command: a.out
==22122==
Hello World!
==22122==
==22122== HEAP SUMMARY:
==22122==   in use at exit: 72,704 bytes in 1 blocks
==22122==   total heap usage: 1 allocs, 0 frees, 72,704 bytes allocated
==22122==
==22122== LEAK SUMMARY:
==22122==   definitely lost: 0 bytes in 0 blocks
==22122==   indirectly lost: 0 bytes in 0 blocks
==22122==   possibly lost: 0 bytes in 0 blocks
==22122==   still reachable: 72,704 bytes in 1 blocks
==22122==   suppressed: 0 bytes in 0 blocks
==22122== Rerun with --leak-check=full to see details of leaked memory
==22122==
==22122== For counts of detected and suppressed errors, rerun with: -v
==22122== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
mschal@andromeda-49 01:42:25 ~/hw/hw1
$
```

convert_knots.cpp

```
mschal@andromeda-49:~/hw/hw1
abcdefghijklmnopqrstuvwxyz 1234567890 abcdefghijklmnopqrstuvwxyz
Reversed:
zyxwvutsrqponmlkjihgfedcba 0987654321 zyxwvutsrqponmlkjihgfedcba
==22287==
==22287== HEAP SUMMARY:
==22287==   in use at exit: 72,704 bytes in 1 blocks
==22287==   total heap usage: 8 allocs, 7 frees, 73,006 bytes allocated
==22287==
==22287== LEAK SUMMARY:
==22287==   definitely lost: 0 bytes in 0 blocks
==22287==   indirectly lost: 0 bytes in 0 blocks
==22287==   possibly lost: 0 bytes in 0 blocks
==22287==   still reachable: 72,704 bytes in 1 blocks
==22287==   suppressed: 0 bytes in 0 blocks
==22287== Rerun with --leak-check=full to see details of leaked memory
==22287==
==22287== For counts of detected and suppressed errors, rerun with: -v
==22287== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
mschal@andromeda-49 01:51:28 ~/hw/hw1
$ g++ convert_knots.cpp
mschal@andromeda-49 01:52:26 ~/hw/hw1
$ a.out
1
0.0191793 miles per minute
mschal@andromeda-49 01:52:31 ~/hw/hw1
$ valgrind a.out
==22301== Memcheck, a memory error detector
==22301== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==22301== Using Valgrind-3.12.0 and LibVEX; rerun with -h for copyright info
==22301== Command: a.out
==22301==
1
0.0191793 miles per minute
==22301==
==22301== HEAP SUMMARY:
==22301==   in use at exit: 72,704 bytes in 1 blocks
==22301==   total heap usage: 2 allocs, 1 frees, 72,761 bytes allocated
==22301==
==22301== LEAK SUMMARY:
==22301==   definitely lost: 0 bytes in 0 blocks
==22301==   indirectly lost: 0 bytes in 0 blocks
==22301==   possibly lost: 0 bytes in 0 blocks
==22301==   still reachable: 72,704 bytes in 1 blocks
==22301==   suppressed: 0 bytes in 0 blocks
==22301== Rerun with --leak-check=full to see details of leaked memory
==22301==
==22301== For counts of detected and suppressed errors, rerun with: -v
==22301== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
mschal@andromeda-49 01:52:36 ~/hw/hw1
$
```

test_stack.cpp

```
mschal@andromeda-49:~/hw/hw1
$ g++ test_stack.cpp
mschal@andromeda-49 01:50:03 ~/hw/hw1
$ a.out
Enter a string:
abcdefghijklmnopqrstuvwxyz
Reversed:
zyxwvutsrqponmlkjihgfedcba
1234567890
Reversed:
0987654321
abcdefghijklmnopqrstuvwxyz 1234567890 abcdefghijklmnopqrstuvwxyz
Reversed:
zyxwvutsrqponmlkjihgfedcba 0987654321 zyxwvutsrqponmlkjihgfedcba
valgrind a.out
Reversed:
two.a dnirglav
mschal@andromeda-49 01:51:03 ~/hw/hw1
$ valgrind a.out
==22287== Memcheck, a memory error detector
==22287== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==22287== Using Valgrind-3.12.0 and LibVEX; rerun with -h for copyright info
==22287== Command: a.out
==22287==
Enter a string:
abcdefghijklmnopqrstuvwxyz
Reversed:
zyxwvutsrqponmlkjihgfedcba
1234567890
Reversed:
0987654321
abcdefghijklmnopqrstuvwxyz 1234567890 abcdefghijklmnopqrstuvwxyz
Reversed:
zyxwvutsrqponmlkjihgfedcba 0987654321 zyxwvutsrqponmlkjihgfedcba
==22287==
==22287== HEAP SUMMARY:
==22287==   in use at exit: 72,704 bytes in 1 blocks
==22287==   total heap usage: 8 allocs, 7 frees, 73,006 bytes allocated
==22287==
==22287== LEAK SUMMARY:
==22287==   definitely lost: 0 bytes in 0 blocks
==22287==   indirectly lost: 0 bytes in 0 blocks
==22287==   possibly lost: 0 bytes in 0 blocks
==22287==   still reachable: 72,704 bytes in 1 blocks
==22287==   suppressed: 0 bytes in 0 blocks
==22287== Rerun with --leak-check=full to see details of leaked memory
==22287==
==22287== For counts of detected and suppressed errors, rerun with: -v
==22287== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
mschal@andromeda-49 01:51:28 ~/hw/hw1
$
```