

4 different runs!

```
valgrind ./lab6
==120271== Memcheck, a memory error detector
==120271== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et
al.
==120271== Using Valgrind-3.11.0 and LibVEX; rerun with -h for copyright
info
==120271== Command: ./lab6
==120271==

shortcut: LA      command: ls -a
shortcut: cl      command: clear
shortcut: hi      command: history

command?: /home/hungaud/Documents/cscd340/Lab6$ ls
alias  cd          history linkedlist path  process  tokenize words
a.out  cscd340Lab6.c lab6      Makefile  pipes  redirect  utils
command?: /home/hungaud/Documents/cscd340/Lab6$ pwd
/home/hungaud/Documents/cscd340/Lab6
command?: /home/hungaud/Documents/cscd340/Lab6$ $PATH
PATH=$PATH:/usr/local/sbin:/usr/local/bin:/usr/sbin:/usr/bin:/sbin:/bin:/
usr/games:/usr/local/games:/snap/bin
command?: /home/hungaud/Documents/cscd340/Lab6$ alskdj
==128541==
==128541== HEAP SUMMARY:
==128541==      in use at exit: 432 bytes in 30 blocks
==128541==    total heap usage: 39 allocs, 9 frees, 7,277 bytes allocated
==128541==
==128541== LEAK SUMMARY:
==128541==    definitely lost: 0 bytes in 0 blocks
==128541==    indirectly lost: 0 bytes in 0 blocks
==128541==    possibly lost: 0 bytes in 0 blocks
==128541==    still reachable: 432 bytes in 30 blocks
==128541==          suppressed: 0 bytes in 0 blocks
==128541== Rerun with --leak-check=full to see details of leaked memory
==128541==
==128541== For counts of detected and suppressed errors, rerun with: -v
==128541== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
command?: /home/hungaud/Documents/cscd340/Lab6$ ls -l | wc -w
137
command?: /home/hungaud/Documents/cscd340/Lab6$ exit
```

List is now cleared

List is now cleared

```
==120271==
==120271== HEAP SUMMARY:
==120271==      in use at exit: 0 bytes in 0 blocks
==120271==    total heap usage: 55 allocs, 55 frees, 12,112 bytes
allocated
==120271==
```

```
==120271== All heap blocks were freed -- no leaks are possible
==120271==
==120271== For counts of detected and suppressed errors, rerun with: -v
==120271== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

```
===== SECOND RUN =====
```

```
valgrind ./lab6
==31729== Memcheck, a memory error detector
==31729== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==31729== Using Valgrind-3.11.0 and LibVEX; rerun with -h for copyright
info
==31729== Command: ./lab6
==31729==
```

```
shortcut: LA      command: ls -a
shortcut: cl      command: clear
shortcut: hi      command: history
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ LA
.      a.out      cscd340Lab6.c  linkedlist      .msshrc  process
utils
..      ..bashrc.swp  history      Makefile      path      redirect  words
alias  cd      lab6      .mssh_history  pipes      tokenize
command?: /home/hungaud/Documents/cscd340/Lab6$ hi
```

```
1.)  LA
2.)  hi
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ !!
```

```
1.)  LA
2.)  hi
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ unalias hi
```

```
shortcut: LA      command: ls -a
shortcut: cl      command: clear
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ hi
==56600==
==56600== HEAP SUMMARY:
==56600==      in use at exit: 377 bytes in 26 blocks
==56600==    total heap usage: 44 allocs, 18 frees, 7,342 bytes allocated
==56600==
==56600== LEAK SUMMARY:
==56600==    definitely lost: 0 bytes in 0 blocks
==56600==    indirectly lost: 0 bytes in 0 blocks
==56600==    possibly lost: 0 bytes in 0 blocks
==56600==    still reachable: 377 bytes in 26 blocks
==56600==          suppressed: 0 bytes in 0 blocks
```

```
==56600== Rerun with --leak-check=full to see details of leaked memory
==56600==
==56600== For counts of detected and suppressed errors, rerun with: -v
==56600== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
command?: /home/hungaud/Documents/cscd340/Lab6$ alias LA="ls -l"
LA what ali is
```

```
shortcut: cl      command: clear
shortcut: LA      command: ls -l
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ LA
total 108
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 alias
-rwxrw-rw- 1 hungaud hungaud 8616 Oct 18 03:17 a.out
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 cd
-rwxrw-rw- 1 hungaud hungaud 7672 Oct 18 13:26 cscd340Lab6.c
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 history
-rwxrwxr-x 1 hungaud hungaud 39456 Oct 18 15:32 lab6
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 linkedlist
-rwxrw-rw- 1 hungaud hungaud 1643 Oct 18 15:26 Makefile
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 path
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 15:32 pipes
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 15:27 process
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 redirect
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 15:32 tokenize
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 utils
drwxrwxrwx 2 hungaud hungaud 4096 Oct 18 13:27 words
command?: /home/hungaud/Documents/cscd340/Lab6$ alias me="pwd"
me what ali is
```

```
shortcut: cl      command: clear
shortcut: LA      command: ls -l
shortcut: me      command: pwd
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ me
/home/hungaud/Documents/cscd340/Lab6
command?: /home/hungaud/Documents/cscd340/Lab6$ !!
/home/hungaud/Documents/cscd340/Lab6
command?: /home/hungaud/Documents/cscd340/Lab6$ history
```

```
1.) LA
2.) hi
3.) unalias hi
4.) hi
5.) alias LA="ls -l"
6.) LA
7.) alias me="pwd"
8.) me
9.) history
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ exit
```

List is now cleared

```
List is now cleared
==31729==
==31729== HEAP SUMMARY:
==31729==      in use at exit: 0 bytes in 0 blocks
==31729==    total heap usage: 92 allocs, 92 frees, 12,621 bytes allocated
==31729==
==31729== All heap blocks were freed -- no leaks are possible
==31729==
==31729== For counts of detected and suppressed errors, rerun with: -v
==31729== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```

```
===== THIRD RUN ===== (created a bad path so commands
doesn't work)
```

```
valgrind ./lab6
==112409== Memcheck, a memory error detector
==112409== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et
al.
==112409== Using Valgrind-3.11.0 and LibVEX; rerun with -h for copyright
info
==112409== Command: ./lab6
==112409==
```

```
shortcut: LA      command: ls -a
shortcut: cl      command: clear
shortcut: hi      command: history
```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ cd asdf
directory does not exist asdf
command?: /home/hungaud/Documents/cscd340/Lab6$ cd ..
command?: /home/hungaud/Documents/cscd340$ cd ../../
command?: /home/hungaud$ cd Documents/cscd340/Lab6
command?: /home/hungaud/Documents/cscd340/Lab6$
command?: /home/hungaud/Documents/cscd340/Lab6$
command?: /home/hungaud/Documents/cscd340/Lab6$
command?: /home/hungaud/Documents/cscd340/Lab6$ PATH=$PATH:/bad/pathhere
command?: /home/hungaud/Documents/cscd340/Lab6$ ls
==17226== Invalid read of size 2
==17226==    at 0x4E7381D: getenv (getenv.c:84)
==17226==    by 0x4F06EAB: execvpe (execvpe.c:89)
==17226==    by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226==    by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba0 is 0 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
```

```
==17226== at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226== at 0x4C31719: __GI_strncmp (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x4E73831: getenv (getenv.c:84)
==17226== by 0x4F06EAB: execvpe (execvpe.c:89)
==17226== by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226== by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba2 is 2 bytes inside a block of size 25 free'd
==17226== at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226== by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226== at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226== at 0x4C31752: __GI_strncmp (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x4E73831: getenv (getenv.c:84)
==17226== by 0x4F06EAB: execvpe (execvpe.c:89)
==17226== by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226== by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba3 is 3 bytes inside a block of size 25 free'd
==17226== at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226== by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226== at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226== at 0x4E73836: getenv (getenv.c:85)
==17226== by 0x4F06EAB: execvpe (execvpe.c:89)
==17226== by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226== by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba4 is 4 bytes inside a block of size 25 free'd
```

```
==17226== at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226== by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226== at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226== at 0x4C30F62: strlen (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x4F06EBF: execvpe (execvpe.c:96)
==17226== by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226== by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba5 is 5 bytes inside a block of size 25 free'd
==17226== at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226== by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226== at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226== at 0x4C30F74: strlen (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x4F06EBF: execvpe (execvpe.c:96)
==17226== by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226== by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba6 is 6 bytes inside a block of size 25 free'd
==17226== at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226== by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226== at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226== by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226== by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226== at 0x4ED0760: strchrnul (strchr.S:24)
==17226== by 0x4F06F53: execvpe (execvpe.c:136)
==17226== by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226== by 0x401AF0: lab5Main (cscd340Lab6.c:286)
```

```
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba5 is 5 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226==    at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226==    at 0x4C34DBC: strchrnul (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x4F06F53: execvpe (execvpe.c:136)
==17226==    by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226==    by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba6 is 6 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226==    at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226==    at 0x4C32DB8: __GI_memcpy (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x4F06F79: execvpe (execvpe.c:143)
==17226==    by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226==    by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba5 is 5 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226==    at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226==    at 0x4C32DC6: __GI_memcpy (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x4F06F79: execvpe (execvpe.c:143)
```

```

==17226==    by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226==    by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba7 is 7 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226==    at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Syscall param execve(envp[i]) points to unaddressable byte(s)
==17226==    at 0x4F06777: execve (syscall-template.S:84)
==17226==    by 0x4F06F8A: execvpe (execvpe.c:146)
==17226==    by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226==    by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206ba0 is 0 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226==    at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226== Invalid read of size 1
==17226==    at 0x4F06FB6: execvpe (execvpe.c:201)
==17226==    by 0x402264: forkIt (in
/home/hungaud/Documents/cscd340/Lab6/lab6)
==17226==    by 0x401AF0: lab5Main (cscd340Lab6.c:286)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Address 0x5206baa is 10 bytes inside a block of size 25 free'd
==17226==    at 0x4C2EDEB: free (in /usr/lib/valgrind/vgpreload_memcheck-
amd64-linux.so)
==17226==    by 0x401864: lab5Main (cscd340Lab6.c:249)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226== Block was alloc'd at
==17226==    at 0x4C2FB55: calloc (in
/usr/lib/valgrind/vgpreload_memcheck-amd64-linux.so)
==17226==    by 0x401812: lab5Main (cscd340Lab6.c:245)
==17226==    by 0x400F78: main (cscd340Lab6.c:75)
==17226==
==17226==
==17226== HEAP SUMMARY:
==17226==    in use at exit: 606 bytes in 39 blocks
==17226== total heap usage: 57 allocs, 18 frees, 7,582 bytes allocated

```



```

==17226==
==17226== LEAK SUMMARY:
==17226==     definitely lost: 0 bytes in 0 blocks
==17226==     indirectly lost: 0 bytes in 0 blocks
==17226==     possibly lost: 0 bytes in 0 blocks
==17226==     still reachable: 606 bytes in 39 blocks
==17226==     suppressed: 0 bytes in 0 blocks
==17226== Rerun with --leak-check=full to see details of leaked memory
==17226==
==17226== For counts of detected and suppressed errors, rerun with: -v
==17226== ERROR SUMMARY: 66 errors from 12 contexts (suppressed: 0 from 0)
command?: /home/hungaud/Documents/cscd340/Lab6$ exit

```

```

List is now cleared
List is now cleared

```

```

==112409==
==112409== HEAP SUMMARY:
==112409==     in use at exit: 0 bytes in 0 blocks
==112409==   total heap usage: 62 allocs, 62 frees, 12,275 bytes
allocated
==112409==
==112409== All heap blocks were freed -- no leaks are possible
==112409==
==112409== For counts of detected and suppressed errors, rerun with: -v
==112409== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)

```

```

===== FOURTH RUN =====

```

```

valgrind ./lab6
==4690== Memcheck, a memory error detector
==4690== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==4690== Using Valgrind-3.11.0 and LibVEX; rerun with -h for copyright
info
==4690== Command: ./lab6
==4690==

```

```

shortcut: LA      command: ls -a
shortcut: cl      command: clear
shortcut: hi      command: history

```

```
command?: /home/hungaud/Documents/cscd340/Lab6$ ls -l > output.txt
output.txt
ls -l
command?: /home/hungaud/Documents/cscd340/Lab6$ wc -w < output.txt
146
command?: /home/hungaud/Documents/cscd340/Lab6$ exit
```

```
List is now cleared
List is now cleared
==4690==
==4690== HEAP SUMMARY:
==4690==      in use at exit: 0 bytes in 0 blocks
==4690==    total heap usage: 46 allocs, 46 frees, 13,096 bytes allocated
==4690==
==4690== All heap blocks were freed -- no leaks are possible
==4690==
==4690== For counts of detected and suppressed errors, rerun with: -v
==4690== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
```