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## Problem 1

```
bringer@bringer-VirtualBox: ~/桌面/hw4
bringer@bringer-VirtualBox:~/桌面/hw4$ g++ String.cpp test_string.cpp -o ts
bringer@bringer-VirtualBox:~/桌面/hw4$ valgrind ./ts
==3285== Memcheck, a memory error detector
==3285== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==3285== Using Valgrind-3.12.0 and LLOVEK; rerun with -h for copyright info
==3285== Command: ./ts
==3285==
test_constructor_and_print-----
Hello World
C++ World
test_copy_constructor-----
Copy:Copy
Copy:Copy2
test_assignment-----
Assign:Assign
assignment:assignment
test_bracket-----
bracket[5]:e
sdfr[3]:s
test_size-----
Hello World:11
Derive:6
test_reverse-----
Hello:olleh
World:dlrow
test_indexOf-----
bjherdj find d: 5
search find e: 1
test_relation_operators-----
==
Ray==Ray:1
{e
Klefstadi=Klefstab:1
>
Klefstadi=Klefstab:0
<
Klefstadi=Klefstab:1
==
Ray==Ray:1
<e
Ray==Ray:1
test_add-----
UCI
CAIrvine
test_addequal-----
UCI
test_read-----
UCI
zhengyiX
zhengyiX
Allocations & deallocations match
==3285==
==3285== HEAP SUMMARY:
==3285==    in use at exit: 0 bytes in 0 blocks
==3285==   total heap usage: 88 allocs, 88 frees, 75,283 bytes allocated
==3285==
==3285== All heap blocks were freed -- no leaks are possible
```

```
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test_constructor_and_print-----
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==3285==
==3285== All heap blocks were freed -- no leaks are possible
==3285==
==3285== For counts of detected and suppressed errors, rerun with: -v
==3285== ERROR SUMMARY: 0 errors from 6 contexts (suppressed: 0 from 0)
bringer@bringer-VirtualBox:~/桌面/hw4$
```

## Problem 2

```
bringer@bringer-VirtualBox: ~/桌面/hw4
bringer@bringer-VirtualBox:~/桌面/hw4$ g++ String.cpp standard_main.cpp -o sm
bringer@bringer-VirtualBox:~/桌面/hw4$ valgrind ./sm
==3217== Memcheck, a memory error detector
==3217== Copyright (C) 2002-2015, and GNU GPL'd, by Julian Seward et al.
==3217== Using Valgrind-3.12.0 and LibVEX; rerun with -h for copyright info
==3217== Command: ./sm
==3217==
+1: FirstSecond
+2: FirstSecond
IndexOf(String): 0
IndexOf(char): 4
LT: 1
GT: 0
LE: 1
GE: 0
<<:
<<: Fourth
+3: 1
IndexOf(String): 0
size(): 0
size(): 0
[]: 1
reverse(): htruof
<<: First First
[]: 1
[]: 0
!a: 0
Enter a test string: Kay Alex
Kay Alex
1
1
0
0
==3217==
==3217== HEAP SUMMARY:
==3217==    in use at exit: 0 bytes in 0 blocks
==3217==   total heap usage: 38 allocs, 38 frees, 74,996 bytes allocated
==3217==
==3217== All heap blocks were freed -- no leaks are possible
==3217==
==3217== For counts of detected and suppressed errors, rerun with: -v
==3217== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 0 from 0)
bringer@bringer-VirtualBox:~/桌面/hw4$
```