

```
1: // $Id: swap.c,v 1.9 2014-02-21 15:43:41-08 - - $
2:
3: //
4: // Example of a swap function to exchange two
5: // areas of memory.
6: //
7:
8: #include <alloca.h>
9: #include <stdio.h>
10: #include <string.h>
11: #include <stdlib.h>
12:
13: // Swap using a malloc'd temp storage, later free'd.
14: void swapm (void *this, void *that, size_t size) {
15:     printf ("%s (%p, %p, %ld)\n", __func__, this, that, size);
16:     void *temp = malloc (size);
17:     printf ("%s: temp=%p\n", __func__, temp);
18:     memcpy (temp, this, size);
19:     memcpy (this, that, size);
20:     memcpy (that, temp, size);
21:     free (temp);
22: }
23:
24: // Swap using alloca'd storage, which is on the stack,
25: // auto freed when the function returns.
26: void swapa (void *this, void *that, size_t size) {
27:     printf ("%s (%p, %p, %ld)\n", __func__, this, that, size);
28:     void *temp = alloca (size);
29:     printf ("%s: temp=%p\n", __func__, temp);
30:     memcpy (temp, this, size);
31:     memcpy (this, that, size);
32:     memcpy (that, temp, size);
33: }
34:
35: int main (int argc, char **argv) {
36:     (void) argc; // warning: unused parameter 'argc'
37:     printf ("%s\n", *argv);
38:     double d1 = 3;
39:     double d2 = 6;
40:     printf ("d1 = %g, d2 = %g\n", d1, d2);
41:     swapm (&d1, &d2, sizeof (double));
42:     printf ("d1 = %g, d2 = %g\n", d1, d2);
43:     char s1[] = "Hello, World.";
44:     char s2[] = "This is a test of swapa.";
45:     printf ("s1 = \"%s\", s2 = \"%s\"\n", s1, s2);
46:     swapa (s1, s2, strlen (s1));
47:     printf ("s1 = \"%s\", s2 = \"%s\"\n", s1, s2);
48:     return 0;
49: }
50:
51: //TEST// valgrind --leak-check=full swap </dev/null >swap.out 2>&1
52: //TEST// mkpspdf swap.ps swap.c* swap.out
53:
```

[illegible]

```
1: ==18686== Memcheck, a memory error detector
2: ==18686== Copyright (C) 2002-2013, and GNU GPL'd, by Julian Seward et al
.
3: ==18686== Using Valgrind-3.10.1 and LibVEX; rerun with -h for copyright
info
4: ==18686== Command: swap
5: ==18686==
6: swap
7: d1 = 3, d2 = 6
8: swapm (0xffefff538, 0xffefff530, 8)
9: swapm: temp=0x9c9a090
10: d1 = 6, d2 = 3
11: s1 = "Hello, World.", s2 = "This is a test of swapa."
12: swapa (0xffefff520, 0xffefff500, 13)
13: swapa: temp=0xffefff480
14: s1 = "This is a tes", s2 = "Hello, World.t of swapa."
15: ==18686==
16: ==18686== HEAP SUMMARY:
17: ==18686==      in use at exit: 0 bytes in 0 blocks
18: ==18686==    total heap usage: 2 allocs, 2 frees, 24 bytes allocated
19: ==18686==
20: ==18686== All heap blocks were freed -- no leaks are possible
21: ==18686==
22: ==18686== For counts of detected and suppressed errors, rerun with: -v
23: ==18686== ERROR SUMMARY: 0 errors from 0 contexts (suppressed: 1 from 1)
```