/**
 * Simple program demonstrating shared memory in POSIX systems.
 *
 * Figure 3.16
 *
 * @author Gagne, Galvin, Silberschatz
 * Operating System Concepts - Eighth Edition
 * Copyright John Wiley & Sons - 2008.
 */

#include <stdio.h>
#include <sys/shm.h>
#include <sys/stat.h>

int main()
{
    /* the identifier for the shared memory segment */
    int segment_id;
    /* a pointer to the shared memory segment */
    char* shared_memory;
    /* the size (in bytes) of the shared memory segment */
    const int segment_size = 4096;

    /** allocate a shared memory segment */
    segment_id = shmget(IPC_PRIVATE, segment_size, S_IRUSR | S_IWUSR);

    /** attach the shared memory segment */
    shared_memory = (char*) shmat(segment_id, NULL, 0);
    printf("shared memory segment %d attached at address %p\n", segment_id, shared_memory);

    /** write a message to the shared memory segment */
    sprintf(shared_memory, "Hi there!\n");

    /** now print out the string from shared memory */
    printf("\%s\n", shared_memory);

    /** now detach the shared memory segment */
    if ( shmdt(shared_memory) == -1) {
        fprintf(stderr, "Unable to detach\n");
    }

    /** now remove the shared memory segment */
    shmctl(segment_id, IPC_RMID, NULL);

    return 0;
}