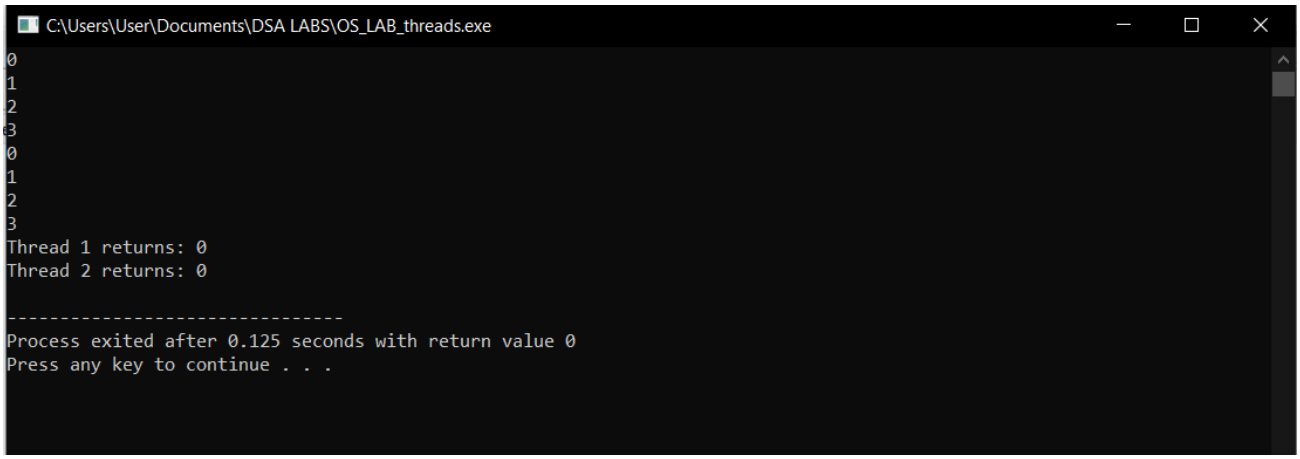
LAB 03:

```
#include <stdio.h>
#include <stdlib.h>
#include <pthread.h>

void *print_message_function(void *ptr);
void *func1(void *ptr);
void *func2(void *ptr);

int main() {
    pthread_t thread1, thread2;
    char *message1 = "Thread 1";
    char *message2 = "Thread 2";
    int iret1, iret2;

    /* Create independent threads each of which will execute function */
    iret1 = pthread_create(&thread1, NULL, func1, (void*) message1);
    iret2 = pthread_create(&thread2, NULL, func2, (void*) message2);

    /* Wait till threads are complete before main continues. Unless we */
    /* wait we run the risk of executing an exit which will terminate */
    /* the process and all threads before the threads have completed. */
    pthread_join(thread1, NULL);
    pthread_join(thread2, NULL);

    printf("Thread 1 returns: %d\n", iret1);
    printf("Thread 2 returns: %d\n", iret2);
```

```
    exit(0);
}

void *func1(void *ptr) {
    for (int i = 0; i <= 3; i++) {
        int delay = 1;
        printf("%d\n", i);
    }
    return NULL;
}

void *func2(void *ptr) {
    for (int i = 0; i <= 3; i++) {
        int delay = 2;
        printf("%d\n", i);
    }
    return NULL;
}

void *print_message_function(void *ptr) {
    char *message;
    message = (char *) ptr;
    printf("%s\n", message);
    return NULL;
}
```



Q:2:

Describe the following line of code: iret1 = pthread_create(&thread1, NULL, print_message_function, (void*) message1);

- **`pthread_create`** is a POSIX threads (pthreads) function used to create a new thread.
- **`&thread1`** is a pointer to a `pthread_t` variable where the thread ID of the newly created thread will be stored.
- **`NULL`** specifies the thread attributes. Passing `NULL` means the thread is created with default attributes.
- **`print_message_function`** is the function that the new thread will execute. This function must have the signature `void* function(void*)`.
- **`(void*) message1`** is a pointer to the argument passed to `print_message_function`. The argument is cast to `(void*)` because pthread functions accept a `void*` argument for generality.

The function returns an integer indicating success or failure:

- On success, `pthread_create` returns 0 and the new thread starts running `print_message_function` with `message1` as its argument.
- The return value is stored in `iret1` to check if thread creation succeeded.