



National Textile University

Department of Computer Science

Subject:

Operating System

Submitted to:

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Submitted by:

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Reg Number:

23-NTU-CS-FL-1158

Lab Number:

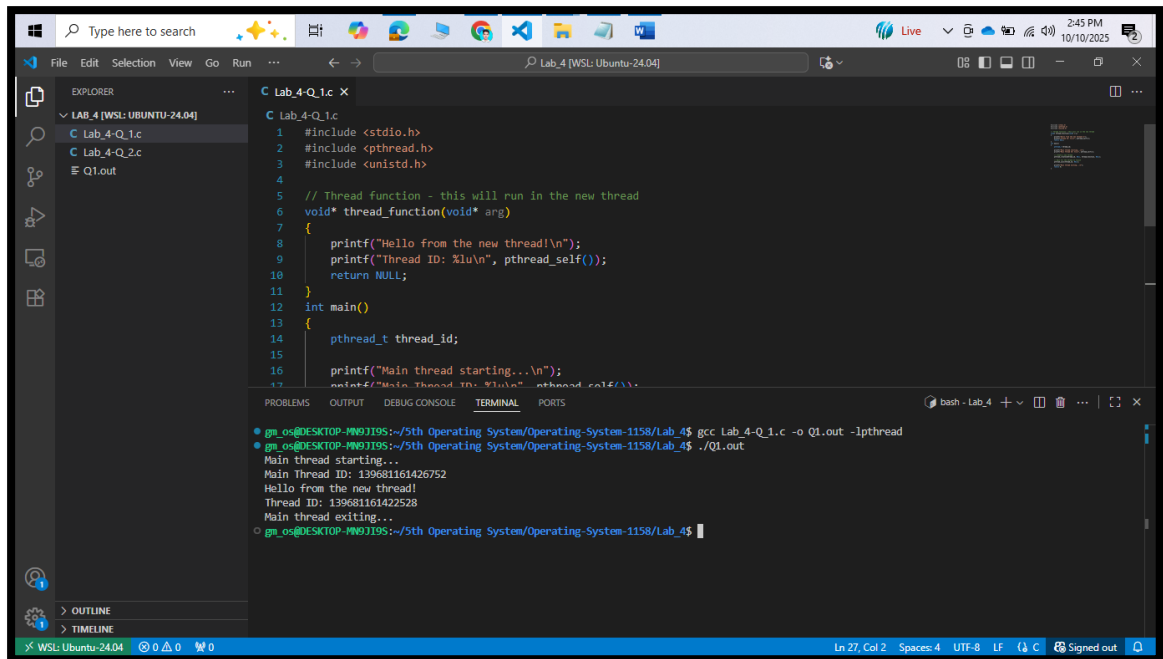
4th

Semester:

4th

Part 3: C Programs with Threads

Program 1: Creating a Simple Thread



The screenshot shows the Visual Studio Code editor with the file `Lab_4-Q_1.c` open. The code defines a thread function `thread_function` and a `main` function that creates and starts a new thread. The terminal output shows the successful execution of the program, including the thread ID and the message "Hello from the new thread".

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

// Thread function - this will run in the new thread
void* thread_function(void* arg)
{
    printf("Hello from the new thread!\n");
    printf("Thread ID: %lu\n", pthread_self());
    return NULL;
}

int main()
{
    pthread_t thread_id;

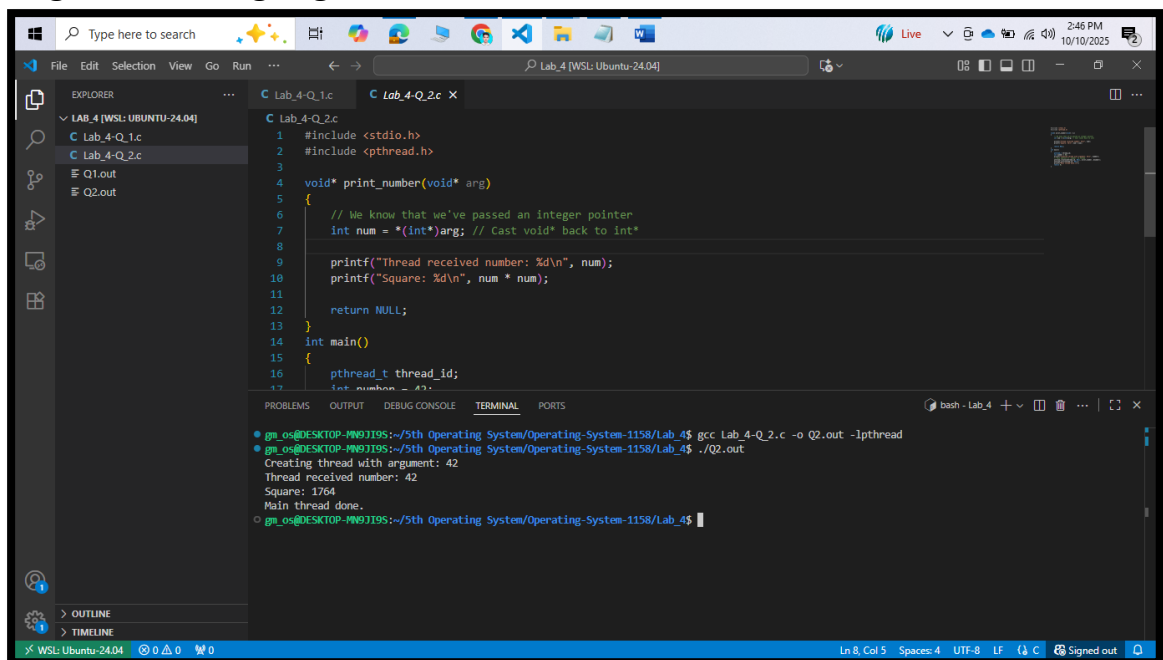
    printf("Main thread starting...\n");
    printf("Main Thread ID: %lu\n", pthread_self());

    pthread_create(&thread_id, NULL, thread_function, NULL);
    pthread_join(thread_id, NULL);

    printf("Main thread exiting...\n");
    return 0;
}
```

```
gn_os@DESKTOP-MN6J195:~/5th Operating System/Operating-System-1158/Lab_4$ gcc Lab_4-Q_1.c -o Q1.out -lpthread
gn_os@DESKTOP-MN6J195:~/5th Operating System/Operating-System-1158/Lab_4$ ./Q1.out
Main thread starting...
Main Thread ID: 139681161426752
Hello from the new thread!
Thread ID: 139681161422528
Main thread exiting...
```

Program 2: Passing Arguments to Threads



The screenshot shows the Visual Studio Code editor with the file `Lab_4-Q_2.c` open. The code defines a thread function `print_number` that takes an integer pointer as an argument. The `main` function creates a thread with the argument `42`. The terminal output shows the thread receiving the number and calculating its square.

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

void* print_number(void* arg)
{
    // We know that we've passed an integer pointer
    int num = *(int*)arg; // Cast void* back to int*

    printf("Thread received number: %d\n", num);
    printf("Square: %d\n", num * num);

    return NULL;
}

int main()
{
    pthread_t thread_id;
    int number = 42;

    pthread_create(&thread_id, NULL, print_number, &number);
    pthread_join(thread_id, NULL);

    printf("Main thread done.\n");
    return 0;
}
```

```
gn_os@DESKTOP-MN6J195:~/5th Operating System/Operating-System-1158/Lab_4$ gcc Lab_4-Q_2.c -o Q2.out -lpthread
gn_os@DESKTOP-MN6J195:~/5th Operating System/Operating-System-1158/Lab_4$ ./Q2.out
Creating thread with argument: 42
Thread received number: 42
Square: 1764
Main thread done.
```