



National Textile University

Department of Computer Science

Subject:

Operating System

Submitted To:

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Registration No:

23-NTU-CS-1163

Lab No:

4

Semester:

5th

Lab 4: Introduction to Threads

3. C Programs with Threads

Program 1: Creating a Simple Thread

The screenshot shows a terminal window titled "OS-Labs [WSL: Ubuntu-24.04]" with the following content:

```
C task1.c U X C task2.c U
Lab4 > C task1.c > thread_function(void *)
1 #include <stdio.h>
2 #include <pthread.h>
3 #include <unistd.h>
4 // Thread function - this will run in the new thread
5 void* thread_function(void* arg) {
6     printf("Hello from the new thread!\n");
7     printf("Thread ID: %lu\n", pthread_self());
8     return NULL;
9 }

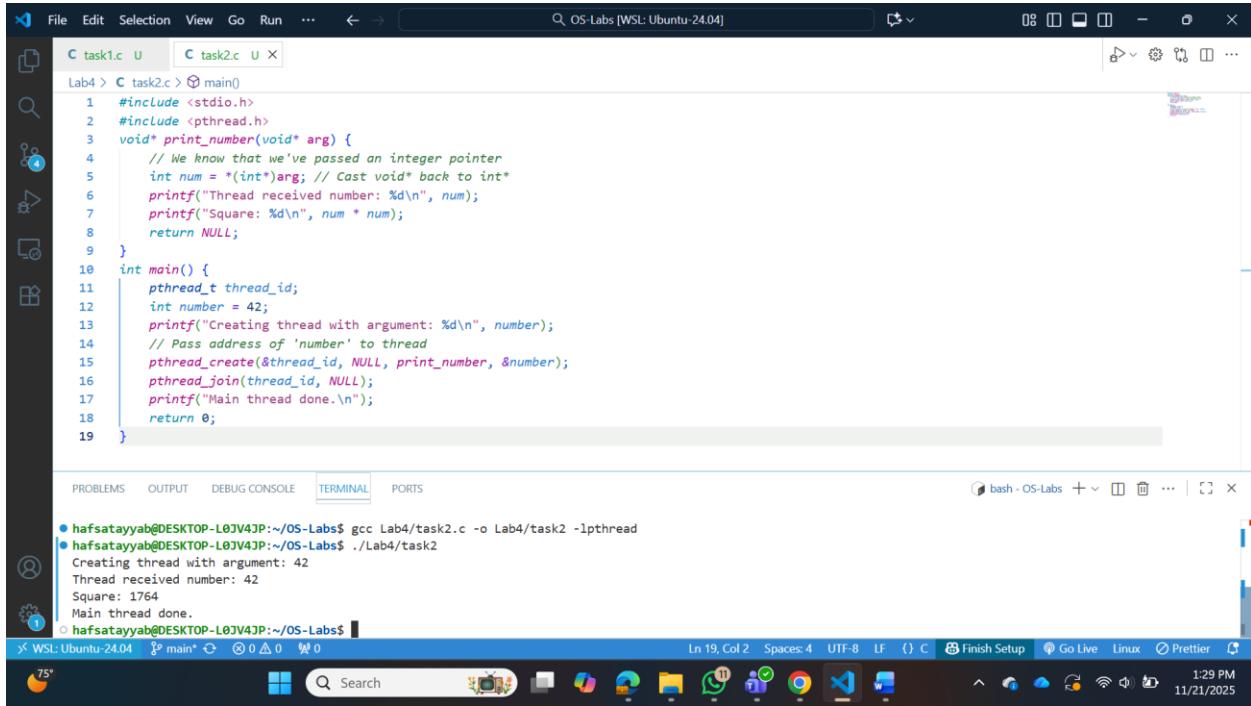
10 int main() {
11     pthread_t thread_id;
12     printf("Main thread starting...\n");
13     printf("Main Thread ID: %lu\n", pthread_self());
14     // Create a new thread
15     pthread_create(&thread_id, NULL, thread_function, NULL);
}

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS

hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ Lab4/task1 -lpthread
bash: Lab4/task1: Permission denied
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ gcc Lab4/task1.c -o Lab4/task1 -lpthread
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ ./Lab4/task1
Main thread starting...
Main Thread ID: 140427149547328
Hello from the new thread!
Thread ID: 140427145508544
Main thread exiting...
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$
```

The terminal shows the execution of the C program. It first attempts to run the binary directly, which fails due to permission denied. Then it compiles the source code into an executable named "Lab4/task1" and runs it. The output indicates that the main thread starts with ID 140427149547328, prints a message from the new thread with ID 140427145508544, and then exits.

Program 2: Passing Arguments to Threads



The screenshot shows a Microsoft Visual Studio Code (VS Code) interface running in a Windows environment. The title bar indicates the window is titled "OS-Labs [WSL: Ubuntu-24.04]". The main editor area displays two files: "task1.c" and "task2.c". The "task2.c" file is open and contains the following C code:

```
Lab4 > C task2.c > main()
1 #include <stdio.h>
2 #include <pthread.h>
3 void* print_number(void* arg) {
4     // We know that we've passed an integer pointer
5     int num = *(int*)arg; // Cast void* back to int*
6     printf("Thread received number: %d\n", num);
7     printf("Square: %d\n", num * num);
8     return NULL;
9 }
10 int main() {
11     pthread_t thread_id;
12     int number = 42;
13     printf("Creating thread with argument: %d\n", number);
14     // Pass address of 'number' to thread
15     pthread_create(&thread_id, NULL, print_number, &number);
16     pthread_join(thread_id, NULL);
17     printf("Main thread done.\n");
18     return 0;
19 }
```

The terminal tab at the bottom shows the output of the program execution:

```
● hfsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ gcc Lab4/task2.c -o Lab4/task2 -lpthread
● hfsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ ./Lab4/task2
Creating thread with argument: 42
Thread received number: 42
Square: 1764
Main thread done.
● hfsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$
```

The taskbar at the bottom of the screen shows various application icons, including a file manager, a browser, and development tools like VS Code and GitHub.