



National Textile University

Department of Computer Science

Subject:

Operating System

Submitted To:

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Submitted By:

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Registration No:

23-NTU-CS-1163

Lab No:

4

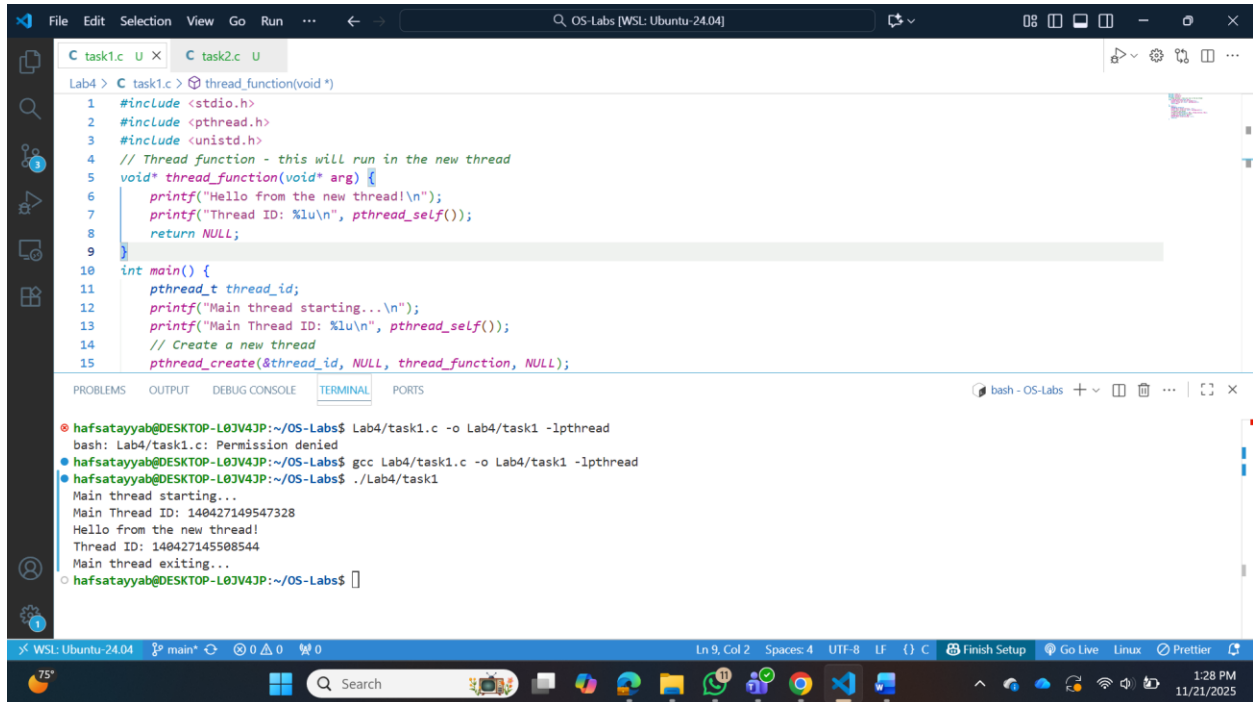
Semester:

5th

Lab 4: Introduction to Threads

3. C Programs with Threads

Program 1: Creating a Simple Thread



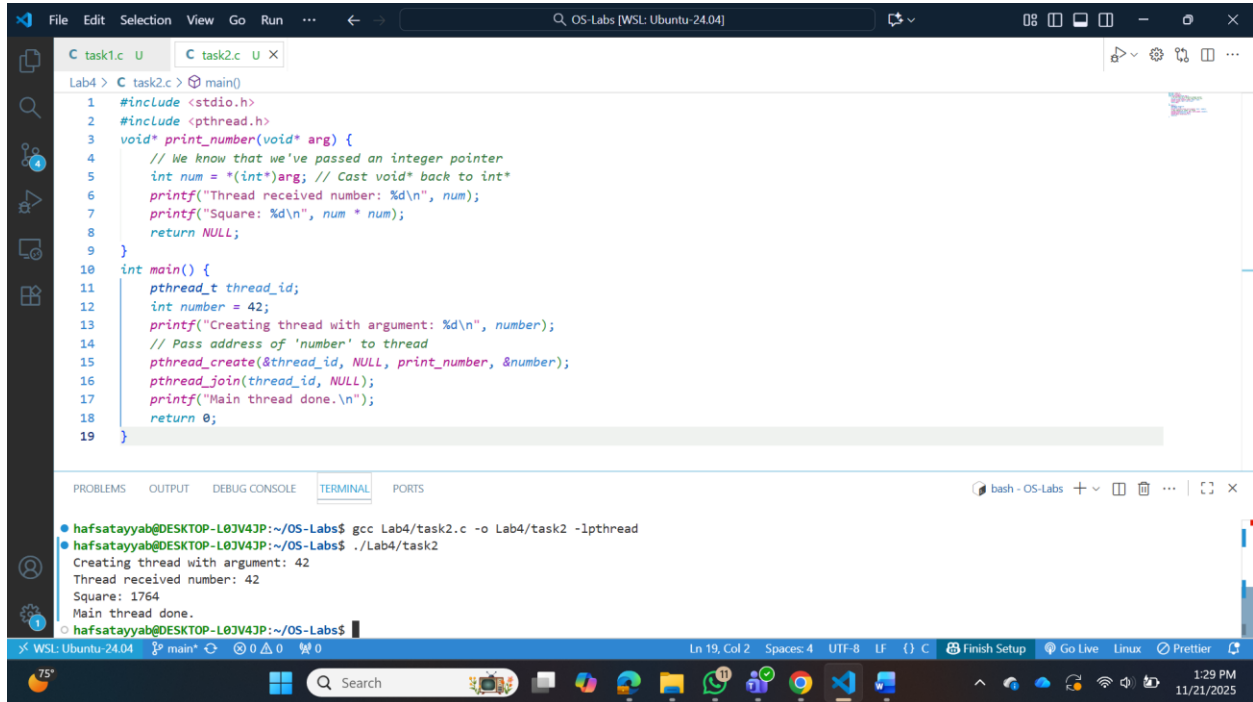
The screenshot shows a Visual Studio Code editor window with a C program named `task1.c` and its execution output in the terminal. The program creates a new thread that prints a message and its ID, while the main thread prints its own ID and exits.

```
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);
```

Terminal Output:

```
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ Lab4/task1.c -o Lab4/task1 -lpthread
bash: Lab4/task1.c: 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...
```

Program 2: Passing Arguments to Threads



```
File Edit Selection View Go Run ... OS-Labs [WSL: Ubuntu-24.04]
C task1.c U C task2.c U X
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 }

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - OS-Labs + - - - - -
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ gcc Lab4/task2.c -o Lab4/task2 -lpthread
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$ ./Lab4/task2
Creating thread with argument: 42
Thread received number: 42
Square: 1764
Main thread done.
hafsatayyab@DESKTOP-L0JV4JP:~/OS-Labs$
```

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