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**National Textile University**

**Department of Computer Science**

**Subject: Operating System**

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**Assignment No.4**

**Semester:5th**

**Lab manual 04**

**Task 1:**

**Code :**

 #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());

 // Create a new thread

 pthread\_create(&thread\_id, NULL, thread\_function, NULL);

// Wait for the thread to finish

 pthread\_join(thread\_id, NULL);

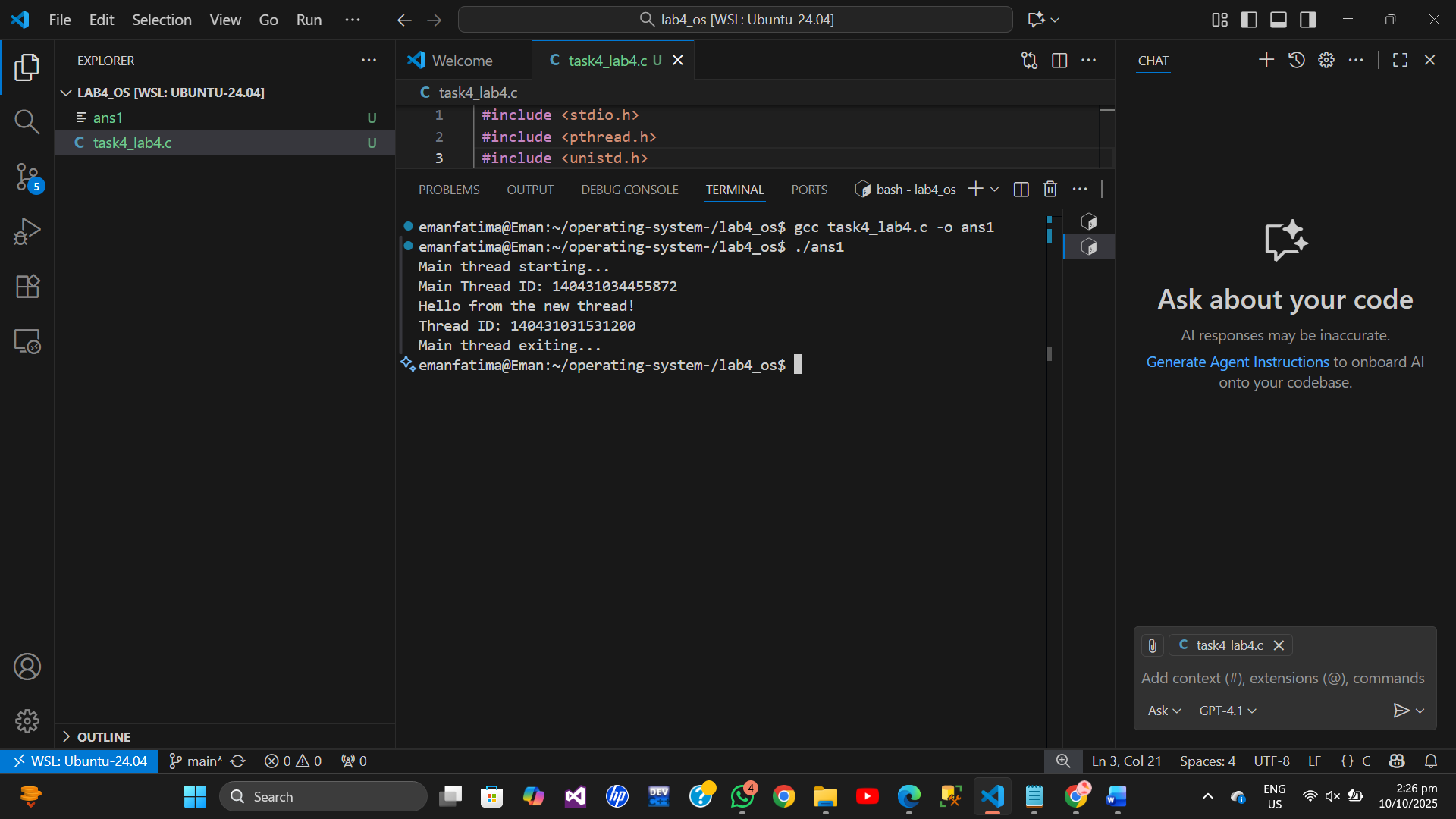
 printf("Main thread exiting...\n");

 return 0;

 }

**Remarks :**

* The main program starts and prints its own ID.
* Then it creates a new thread.
* The new thread runs the thread\_function, prints its message and its own ID.
* The main program waits for the new thread to finish, then prints “Main thread exiting.



**Task 2:**

**Code :**

 #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;

 printf("Creating thread with argument: %d\n", number);

 // Pass address of 'number' to thread

 pthread\_create(&thread\_id, NULL, print\_number, &number);

 pthread\_join(thread\_id, NULL);

 printf("Main thread done.\n");

 return 0;

 }

**Remarks :**

* **In this program, the main function is running, and a number 42 is created.**
* **Then, a new thread is created.**
* **A thread function is defined, and this number is passed to the thread as an argument (by passing the address of the variable number).**
* **Inside the thread function, the argument is received as a void\* pointer.**
* **To use it as an integer, it is typecast back to an int using \*(int\*)arg.**
* **Then, the thread prints the received number and its square.**
* **Finally, the main program waits for the thread to finish before printing “Main thread done.”**

