National Textile University

Department of Computer Science

Subject:

Operating System

Submitted to:

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Submitted by:

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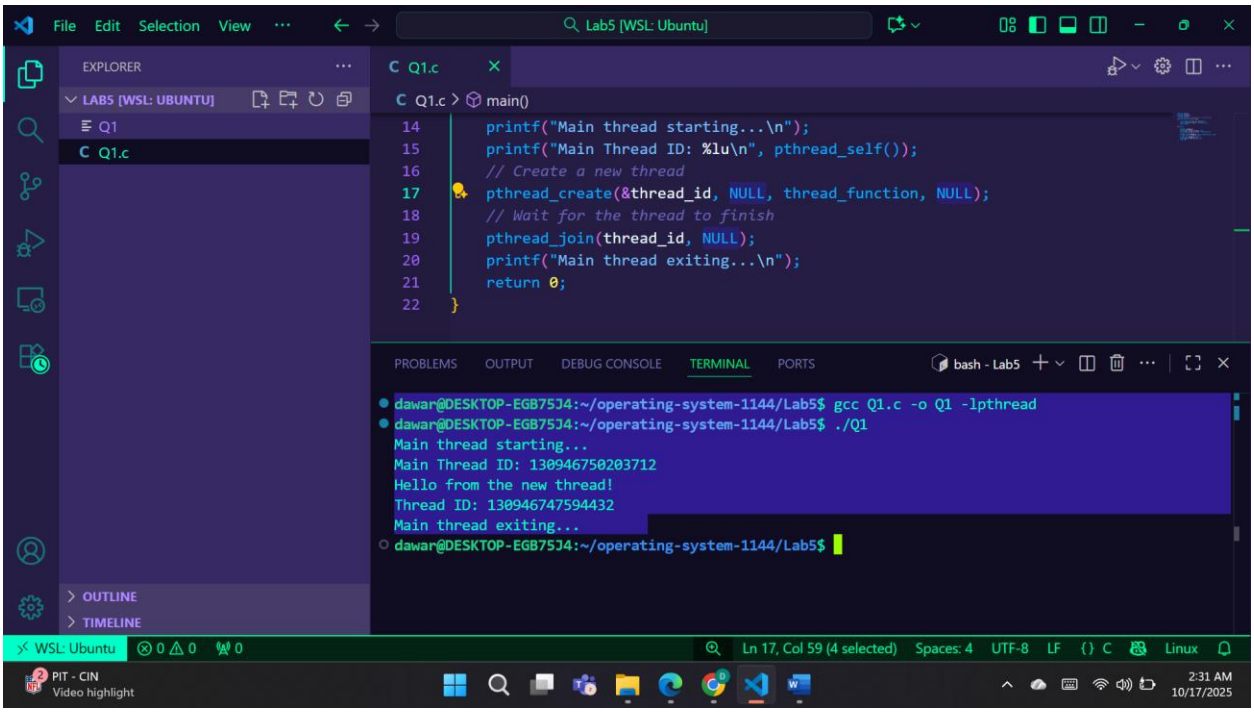
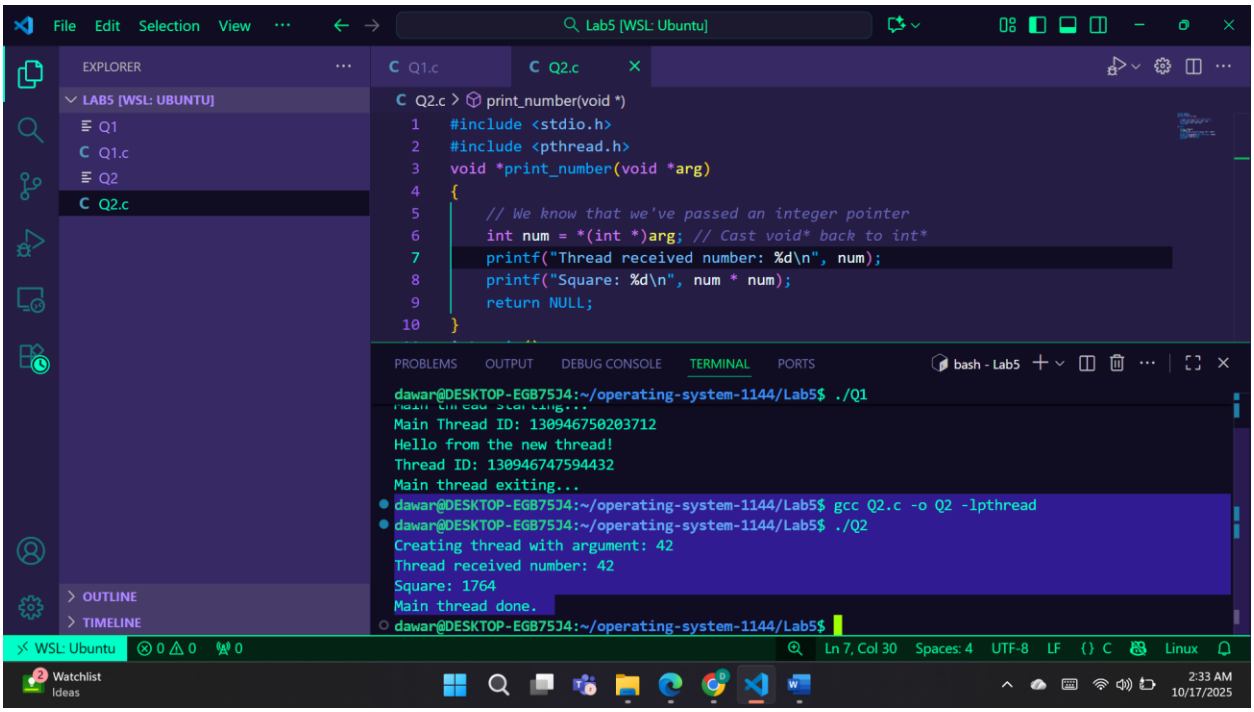
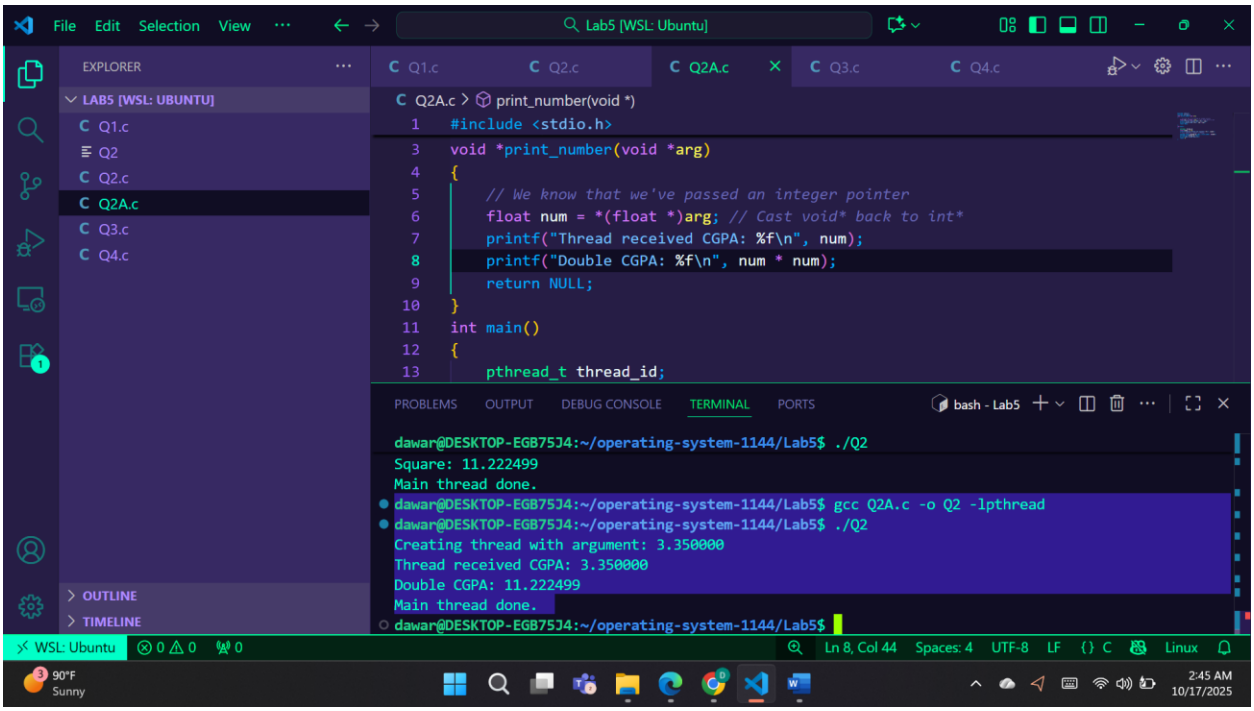
Reg number:

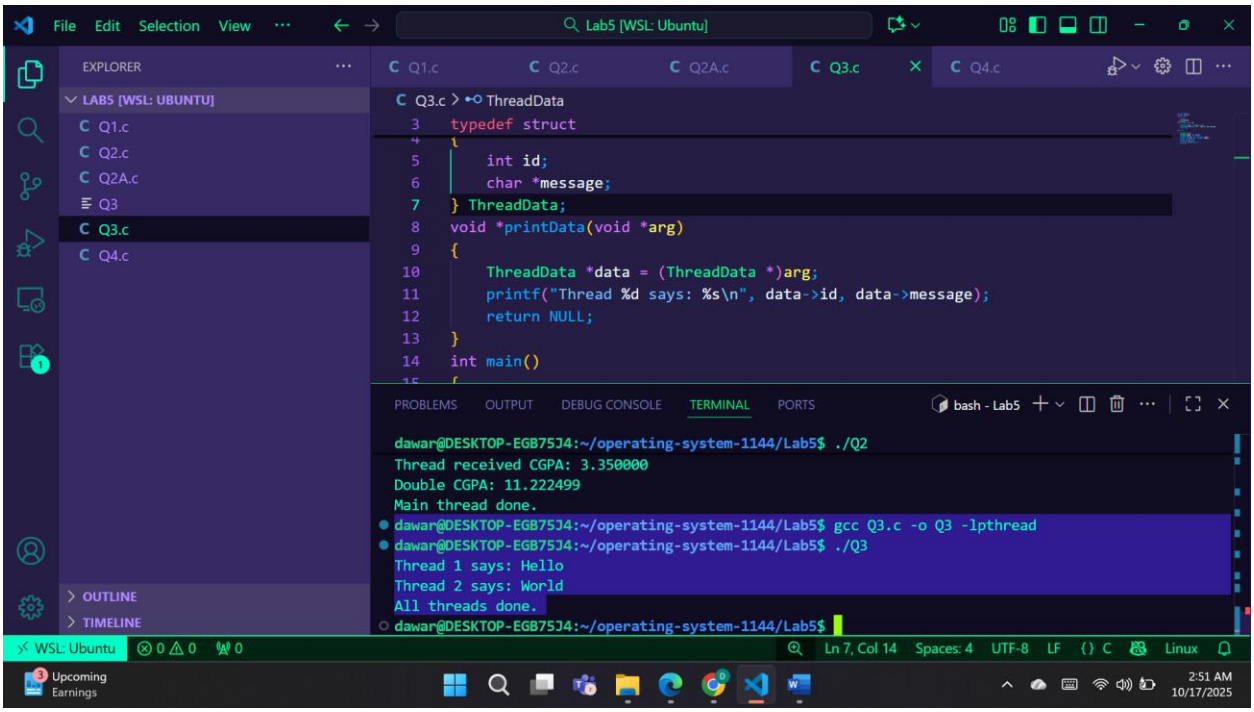
1144

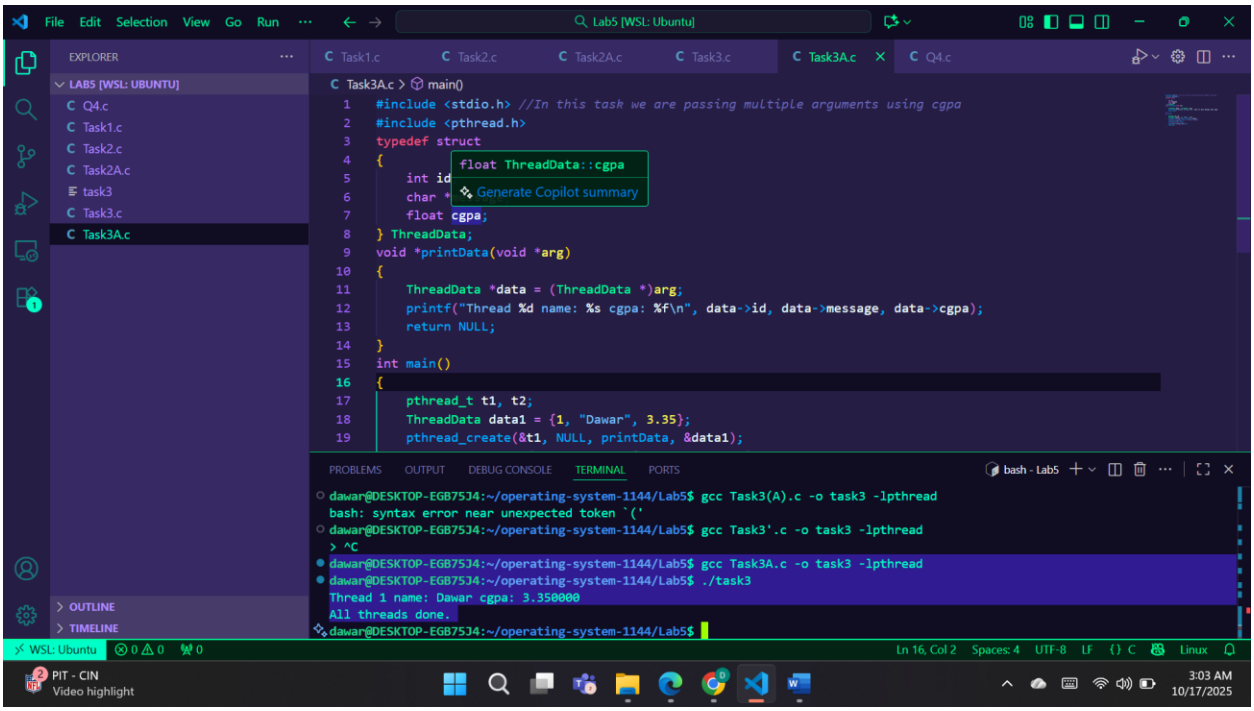
Lab 5

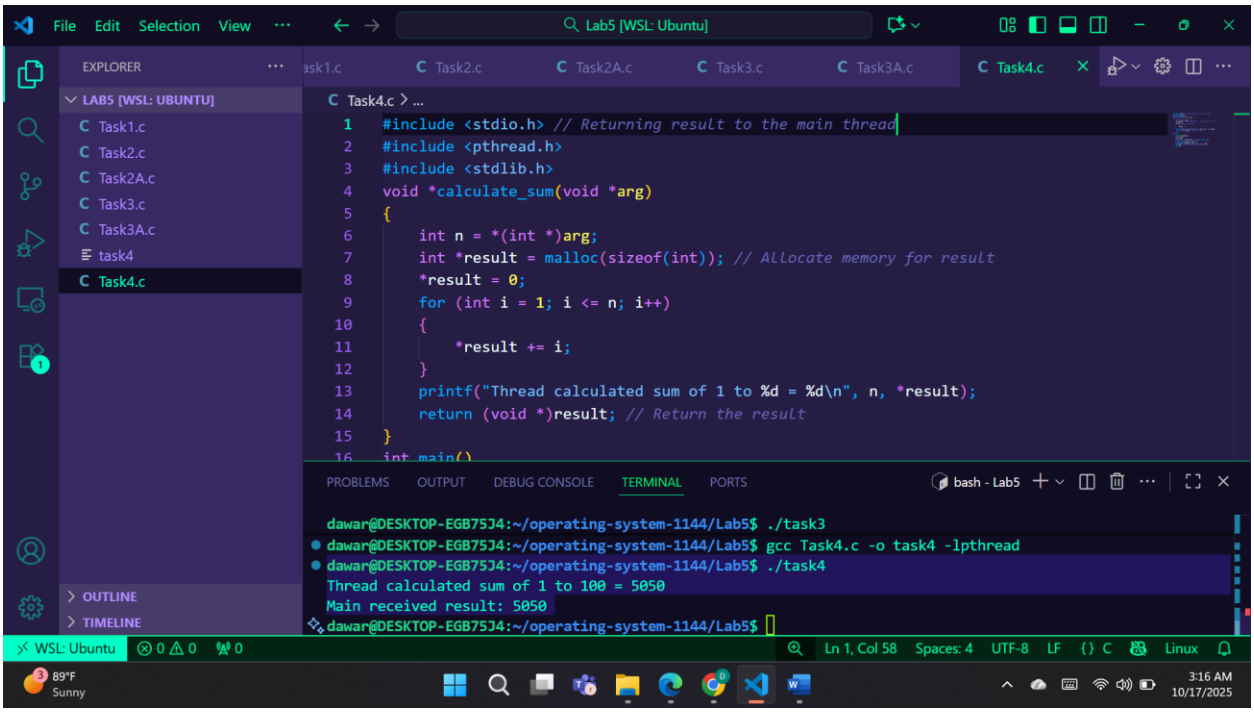

File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
Q1
Q1.c
Q1.c
Q1.c > main()
14 printf("Main thread starting...\n");
15 printf("Main Thread ID: %lu\n", pthread_self());
16 // Create a new thread
17 pthread_create(&thread_id, NULL, thread_function, NULL);
18 // Wait for the thread to finish
19 pthread_join(thread_id, NULL);
20 printf("Main thread exiting...\n");
21 return 0;
22 }
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Q1.c -o Q1 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q1
Main thread starting...
Main Thread ID: 130946750203712
Hello from the new thread!
Thread ID: 130946747594432
Main thread exiting...
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
OUTLINE
TIMELINE
WSL: Ubuntu
Ln 17, Col 59 (4 selected) Spaces: 4 UTF-8 LF {} C Linux
PIT - CIN
Video highlight
2:31 AM
10/17/2025

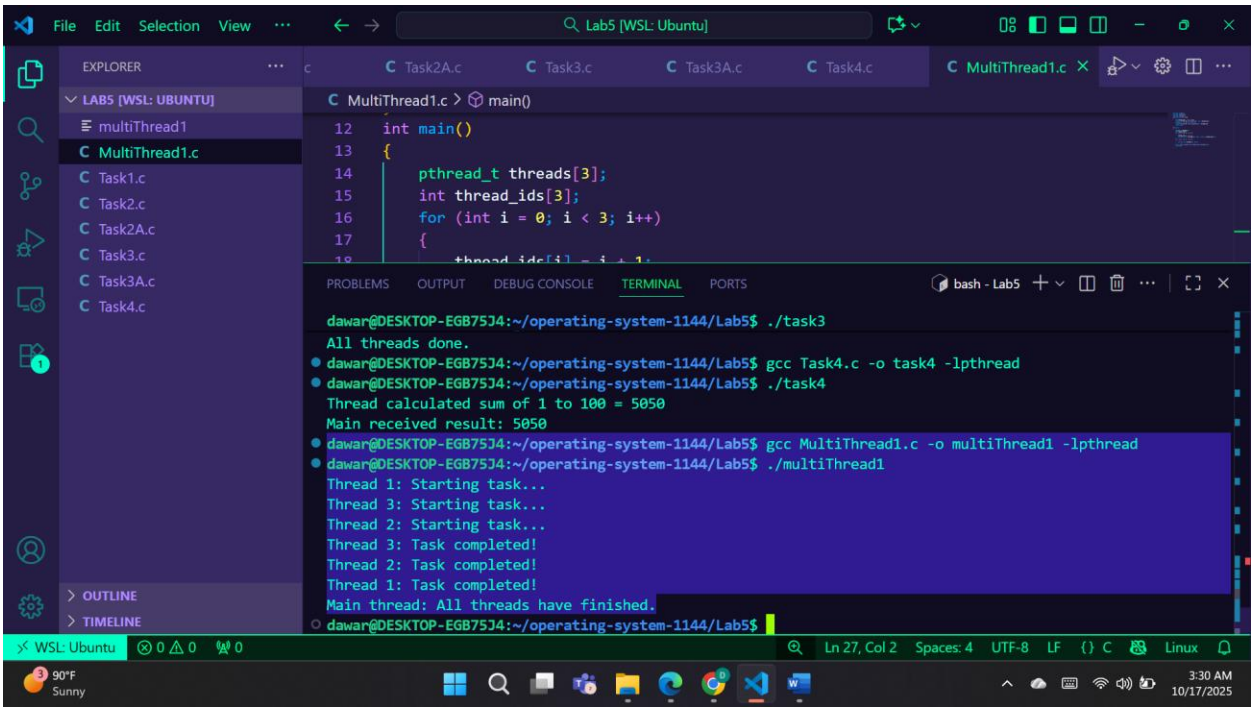

File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
Q1
Q1.c
Q2
Q2.c
Q1.c
Q2.c
Q2.c > print_number(void *)
1 #include <stdio.h>
2 #include <pthread.h>
3 void *print_number(void *arg)
4 {
5 // We know that we've passed an integer pointer
6 int num = *(int *)arg; // Cast void* back to int*
7 printf("Thread received number: %d\n", num);
8 printf("Square: %d\n", num * num);
9 return NULL;
10 }
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q1
Main Thread ID: 130946750203712
Hello from the new thread!
Thread ID: 130946747594432
Main thread exiting...
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Q2.c -o Q2 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q2
Creating thread with argument: 42
Thread received number: 42
Square: 1764
Main thread done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
OUTLINE
TIMELINE
WSL: Ubuntu
Ln 7, Col 30 Spaces: 4 UTF-8 LF {} C Linux
Watchlist
Ideas
2:33 AM
10/17/2025

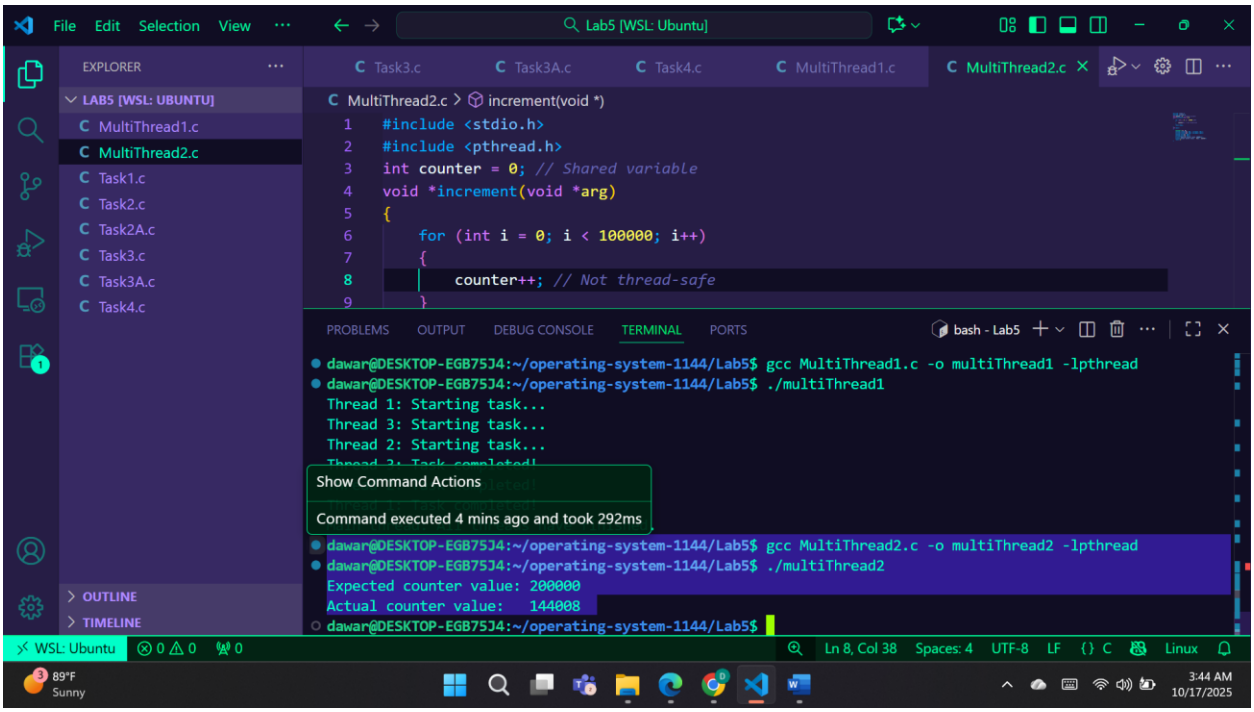

File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
Q1.c
Q2
Q2.c
Q2A.c
Q3.c
Q4.c
Q1.c Q2.c Q2A.c Q3.c Q4.c
Q2A.c > print_number(void *)
#include <stdio.h>
void *print_number(void *arg)
{
// We know that we've passed an integer pointer
float num = *(float *)arg; // Cast void* back to int*
printf("Thread received CGPA: %f\n", num);
printf("Double CGPA: %f\n", num * num);
return NULL;
}
int main()
{
pthread_t thread_id;
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q2
Square: 11.222499
Main thread done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Q2A.c -o Q2 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q2
Creating thread with argument: 3.350000
Thread received CGPA: 3.350000
Double CGPA: 11.222499
Main thread done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
OUTLINE
TIMELINE
WSL: Ubuntu
Ln 8, Col 44 Spaces: 4 UTF-8 LF {} C Linux
90°F Sunny
2:45 AM 10/17/2025


File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
Q1.c
Q2.c
Q2A.c
Q3
Q3.c
Q4.c
Q1.c Q2.c Q2A.c Q3.c Q4.c
Q3.c > ThreadData
typedef struct
{
int id;
char *message;
} ThreadData;
void *printData(void *arg)
{
ThreadData *data = (ThreadData *)arg;
printf("Thread %d says: %s\n", data->id, data->message);
return NULL;
}
int main()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q2
Thread received CGPA: 3.350000
Double CGPA: 11.222499
Main thread done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Q3.c -o Q3 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./Q3
Thread 1 says: Hello
Thread 2 says: World
All threads done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
OUTLINE
TIMELINE
WSL: Ubuntu
Ln 7, Col 14 Spaces: 4 UTF-8 LF {} C Linux
Upcoming Earnings
2:51 AM 10/17/2025


File Edit Selection View Go Run
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
Q4.c
Task1.c
Task2.c
Task2A.c
task3
Task3.c
Task3A.c
Task1.c Task2.c Task2A.c Task3.c Task3A.c Q4.c
Task3A.c > main()
#include <stdio.h> //In this task we are passing multiple arguments using cgpa
#include <pthread.h>
typedef struct
{
int id
char *
float cgpa;
} ThreadData;
float ThreadData::cgpa
Generate Copilot summary
void *printData(void *arg)
{
ThreadData *data = (ThreadData *)arg;
printf("Thread %d name: %s cgpa: %f\n", data->id, data->message, data->cgpa);
return NULL;
}
int main()
{
pthread_t t1, t2;
ThreadData data1 = {1, "Dawar", 3.35};
pthread_create(&t1, NULL, printData, &data1);
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Task3(A).c -o task3 -lpthread
bash: syntax error near unexpected token `('
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Task3'.c -o task3 -lpthread
> ^C
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Task3A.c -o task3 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./task3
Thread 1 name: Dawar cgpa: 3.350000
All threads done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
OUTLINE
TIMELINE
WSL: Ubuntu
Ln 16, Col 2 Spaces: 4 UTF-8 LF C Linux
PIT - CIN
Video highlight
3:03 AM
10/17/2025


File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
Task1.c
Task2.c
Task2A.c
Task3.c
Task3A.c
task4
Task4.c
Task2.c Task2A.c Task3.c Task3A.c Task4.c
Task4.c > ...
#include <stdio.h> // Returning result to the main thread
#include <pthread.h>
#include <stdlib.h>
void *calculate_sum(void *arg)
{
int n = *(int *)arg;
int *result = malloc(sizeof(int)); // Allocate memory for result
*result = 0;
for (int i = 1; i <= n; i++)
{
*result += i;
}
printf("Thread calculated sum of 1 to %d = %d\n", n, *result);
return (void *)result; // Return the result
}
int main()
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./task3
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Task4.c -o task4 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./task4
Thread calculated sum of 1 to 100 = 5050
Main received result: 5050
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
OUTLINE
TIMELINE
WSL: Ubuntu
Ln 1, Col 58 Spaces: 4 UTF-8 LF C Linux
89°F
Sunny
3:16 AM
10/17/2025


File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
multiThread1
MultiThread1.c
Task1.c
Task2.c
Task2A.c
Task3.c
Task3A.c
Task4.c
OUTLINE
TIMELINE
Task2A.c
Task3.c
Task3A.c
Task4.c
MultiThread1.c
MultiThread1.c > main()
12 int main()
13 {
14 pthread_t threads[3];
15 int thread_ids[3];
16 for (int i = 0; i < 3; i++)
17 {
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./task3
All threads done.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc Task4.c -o task4 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./task4
Thread calculated sum of 1 to 100 = 5050
Main received result: 5050
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc MultiThread1.c -o multiThread1 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./multiThread1
Thread 1: Starting task...
Thread 3: Starting task...
Thread 2: Starting task...
Thread 3: Task completed!
Thread 2: Task completed!
Thread 1: Task completed!
Main thread: All threads have finished.
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
WSL: Ubuntu
Ln 27, Col 2 Spaces: 4 UTF-8 LF {} C Linux
90°F Sunny
3:30 AM 10/17/2025


File Edit Selection View
Lab5 [WSL: Ubuntu]
EXPLORER
LAB5 [WSL: UBUNTU]
MultiThread1.c
MultiThread2.c
Task1.c
Task2.c
Task2A.c
Task3.c
Task3A.c
Task4.c
OUTLINE
TIMELINE
Task3.c
Task3A.c
Task4.c
MultiThread1.c
MultiThread2.c
MultiThread2.c > increment(void *)
1 #include <stdio.h>
2 #include <pthread.h>
3 int counter = 0; // Shared variable
4 void *increment(void *arg)
5 {
6 for (int i = 0; i < 100000; i++)
7 {
8 counter++; // Not thread-safe
9 }
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
bash - Lab5
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc MultiThread1.c -o multiThread1 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./multiThread1
Thread 1: Starting task...
Thread 3: Starting task...
Thread 2: Starting task...
Show Command Actions
Command executed 4 mins ago and took 292ms
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ gcc MultiThread2.c -o multiThread2 -lpthread
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$ ./multiThread2
Expected counter value: 200000
Actual counter value: 144008
dawar@DESKTOP-EGB75J4:~/operating-system-1144/Lab5$
WSL: Ubuntu
Ln 8, Col 38 Spaces: 4 UTF-8 LF {} C Linux
89°F Sunny
3:44 AM 10/17/2025