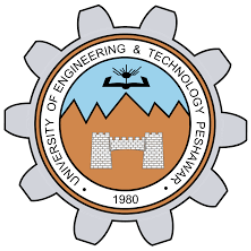
Operating Systems Lab-8

Threads Creation and Execution



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Section: "A"

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CSE 302L: Operating Systems Lab

LAB ASSESSMENT RUBRICS

Marking Criteria	Exceeds expectation (2.5)	Meets expectation (1.5)	Does not meet expectation (0)	Sc
1. Correctness	Program compiles (no errors and no warnings). Program always works correctly and meets the specification(s). Completed between 81-100% of the requirements.	Program compiles (no errors and some warnings). Some details of the program specification are violated, program functions incorrectly for some inputs. Completed between 41-80% of the requirements.	Program fails to or compile with lots of warnings. Program only functions correctly in very limited cases or not at all. Completed less than 40% of the requirements.	
2. Delivery	Delivered on time, and in correct format (disk, email, hard copy etc.)	Not delivered on time, or slightly incorrect format.	Not delivered on time or not in correct format.	
3. Coding Standards	Proper indentation, whitespace, line length, wrapping, comments and references.	Missing some of whitespace, line length, wrapping, comments or references.	Poor use of whitespace, line length, wrapping, comments and references.	
4. Presentation of document	Includes name, date, and assignment title. Task titles, objectives, output screenshots included and good formatting and excellently organized.	Includes name, date, and assignment title. Task titles, objectives, output screenshots included and good formatting.	No name, date, or assignment title included. No task titles, no objectives, no output screenshots, poor formatting.	

Instructor:

Name: __Engr. Madiha Sher___ Signature: _____

Operating Systems Lab

What is a Thread?:

A thread is a single sequential flow of control within a program. Threads are also called lightweight processes as they possess some of the properties of processes. Each thread belongs to exactly one process.

What is a pthread?:

A pthread is a thread of execution in a POSIX-compliant operating system. It is a lightweight process that shares the same address space and resources as other threads in the same process. Pthreads can be used to improve the performance and responsiveness of a program by allowing multiple tasks to be executed concurrently.

Objectives:

This lab examines aspects of threads and multiprocessing (and multithreading). The primary objective of this lab is to implement Thread Management Functions:

- **Creating Threads**
- **Terminating Thread Execution**
- **Thread Identifiers**
- **Joining Threads**

Task #1:

Code:

awais@DESKTOP-NEII4G1: /mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8

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

void *ChildThread(void *argument){
      int i;
      for ( i = 1; i <= 20; ++i ){
           printf(" Child Count - %d\n", i);
      }
    pthread_exit(NULL);
}
int main(){
        pthread_t   hThread;
                int   ret;
        ret=pthread_create(&hThread, NULL, (void *)ChildThread, NULL); /* Create Thread */
        if (ret < 0){
            printf("Thread Creation Failed\n");
                        return 1;
                }

        pthread_join (hThread, NULL);  /* Parent waits for  */
          printf("Parent is continuing....\n");

return 0;
}
```

Output:

Select awais@DESKTOP-NEII4G1: /mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8

```
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$ vim Task1.c
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$ gcc Task1.c -o Task1.o
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$ ./Task1.o
 Child Count - 1
 Child Count - 2
 Child Count - 3
 Child Count - 4
 Child Count - 5
 Child Count - 6
 Child Count - 7
 Child Count - 8
 Child Count - 9
 Child Count - 10
 Child Count - 11
 Child Count - 12
 Child Count - 13
 Child Count - 14
 Child Count - 15
 Child Count - 16
 Child Count - 17
 Child Count - 18
 Child Count - 19
 Child Count - 20
Parent is continuing....
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$
```

Task #2:

Code:

awais@DESKTOP-NEII4G1: /mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8

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

void ChildThread (int argument){
      int i;
        printf("This is child thread \n");
     pthread_exit(NULL);
      /* No pthread_exit function */
}

int main(void)
{
   pthread_t  hThread;

   pthread_create(&hThread, NULL, (void*) ChildThread, NULL);

   pthread_join (hThread, NULL);
   printf ("Master thread is continuing....\n");        return 0;
}
```

Output:

awais@DESKTOP-NEII4G1: /mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8

```
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$ gcc Task2.c -o Task2.o
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$ ./Task2.o
This is child thread
Master thread is continuing....
awais@DESKTOP-NEII4G1:/mnt/e/Computer_System-Engineering/Fourth Semester/Operating System Lab/lab-8$
```