ECS 408/608 : Operaitng System
Multithreading

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Abstract

This assignment aims to familiarize you with multithreading concept using pthreads, windows and java threads. Note that you can use any one from pthread, window or Java thread to solve the assignment.

User Thread and Kernel Thread

- **User threads:** Management done by user-level threads library.
- Three primary thread libraries:
  1. POSIX Pthreads
  2. Windows threads
  3. Java threads
- **Kernel threads:** Supported by the kernel.
- Examples: Virtually all general-purpose operating systems, including:
  1. Windows
  2. Linux
  3. MAC OS X
  4. IOS
  5. Android

Figure 1 represents the conceptualized view of thread based mechansim vs process view

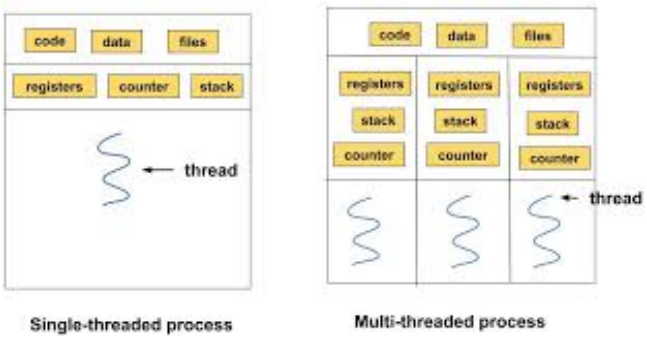

Figure 1: Thread View vs Process View

Problems

1. Write a program to create a thread T1. The main process passes two numbers on T1. In result, T1 returns the sum to the parent process for printing.

2. Create a program that spawns two threads, T1 and T2. Thread T1 is responsible for generating a file named "data.txt," and T2 is tasked with writing specific content to the "data.txt" file.
   Hints: You can use an `open()` system call to create a file.
   `read()` to collect data to be written.
   `write()` to put the content in the file.

3. Create a program that spawns two threads, T1 and T2. Each of the thread accepts an 10,000 element array as an input, Thread T1 and T2 prints each and every array element by adding an integer 2 and multiplied by 4. Both the threads are canceled after 1 second from the main thread after spawning T1 and T2.

Assignment Submission Instruction:

- Based on your observed result, create a report with your name and roll number with assignment ID (For example, Sukarn_Agarwal_21056_Assign4.pdf).
- Submitted pdf file contains answers to all the questions above in order. **Any out-of-order answer results in a zero mark.**
- With each question, attach all the screenshots you observed on your screen. Make sure that your name should appear there. **If TA finds any discrepancy in this, zero marks will be awarded.**
- Use of CC computers are prohibited for solving the assignment.
- **The last date to submit the assignment is by the end of day of 19 March 2025 (IST). Any late submission results in the 0 Marks and no requests to be entertained.**