In the Name of God

Parallel Algorithms, Spring 2020

Homework #2: Pthread

Due date:

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1. You will write a simple Hello World program in C that prints “hello world!” 5 times in a loop, but there's a catch. You will need to launch two threads, one that prints "hello", and one that prints "world!". You will need a semaphore to make sure that they get printed in the correct order. (40 pts)

2. The following serial program calculates and displays π. Using Pthread, write its parallel program and test your program with the different number of threads and report your results. (60 pts)

```c
//File name: PI.c
#include <stdio.h>
#include <stdlib.h>
#define n 1000000
int main(){
    double factor = 1, sum = 0, pi;
    int i;
    for(i = 0; i < n; i++){
        sum += factor/(2*i+1);
        factor = -factor;
        }
    pi = 4 * sum;
    printf("pi = %fn", pi);
    return 0;
    }
//Output:
//pi = 3.141592
```

You should write a complete report, including:

- Your computer's specifications (including the number of CPU cores, memory, …)
- An explanation of how to run your code (Linux command to run your code)
- Explain your approach for each exercise
- A comparison between the execution time of your serial and parallel codes, and calculate speed-up.

Reminders:

- Each HW has to be done individually (**For assignments that are similar to each other, the grade is 0.)**
- 50% of your points belong to the report.
- Your codes and the report should only be submitted before the due date through email to TA (**majidsalimib@gmail.com**).
- In-person delivery will be announced.