CSC 33200 (L) - Operating Systems – Spring 2022

Lab 6: Process Synchronization
Date: 04/08/2022

DUE: May 15, 2022

Problem Description

Consider a system with 3 smoker processes and 1 agent process. Each smoker continuously rolls a cigarette and then smokes it. The smoker needs three ingredients: tobacco, paper, and matches. One of the smokers has paper, another has tobacco, and the third has matches. The agent has an infinite supply of all three materials and (randomly) places two of the ingredients on the table each time. The smoker who has the remaining ingredient then makes and smokes a cigarette, signaling the agent on completion. The agent then puts out another two of the three ingredients, and the cycle repeats.

Task: Write **two** programs to synchronize the agent and smoker processes: one using **semaphores** and another using **pthread libraries.**

Instructions

- Please see this link for pseudocode:

  http://www.cs.umd.edu/~hollings/cs412/s96/synch/smokers.html

- Though the description says the agent process can infinitely supply two of the three ingredients, you can assume that the agent places ingredients only a finite number of times, say for example 10.
- You need to use the "sem.h" header file in your semaphore-based solution.
- Write a brief report on how your solution synchronizes the four processes. The C solution files must be internally documented.

Marks:

Semaphore solution : 15
pthread libraries solution: 15
Report: 10

Submission Instructions

- All the programs MUST be clearly indented and internally documented
- Make sure your programs compile and run without any errors
- Only include c files or txt files for submission. Do not include any executables.
- Save all your programs with meaningful names and zip into a single folder as: Lab6_[your last name here].zip (e.g., Lab6_Xyz.zip)
- Email your code with the subject line, "**Task6-CSC33200–Section G(41559)-*lastname***"
- Email: sdebnath@ccny.cuny.edu

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Office Hour: Thursday 11:00 AM – 12:00 PM
Zoom Link: https://ccny.zoom.us/j/82938095199

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