Lab 6 - Description

(Time slicing with processes)

Lab Overview:

For this lab, we will be learning how to use signals to perform time scheduling for processes in C. This is an important concept as any real foray into parallel processing and OS management requires the direct management of processes in order to maximize the efficiency of the system.

Core Tasks:

1. Add a loop to the parent section of your lab 5 code.
2. Inside the loop, implement round-robin time slicing.

Task Details:

1. Add a loop to the parent section of your lab 5 code.
    a. In the code from your lab 5 or project 2 part 2 add a loop to your parent process after it sends the `SIGUSR1` signal.
2. Inside the loop, implement round-robin time slicing.
    a. Your parent must do the following until the children exits.
        i. Send `SIGSTOP` to the current child.
        ii. Send `SIGCONT` to the next child.
        iii. Sleep for 1 second.

Remarks:

This lab is very simple but there is a large potential to over complicate your solution. The hardest task here is to figure out how to tell if any of your children are alive and what to do if a child dies. This is the core problem you need to solve in this lab and will take some creativity.
If you wish to learn more about job scheduling for the project see the following resource: https://www.gnu.org/software/libc/manual/html_node/Job-Control.html#Job-Control

Submission Requirements:

In order to receive any credit for a lab, completion of the labs' core tasks must be demonstrated to the TA’s. In order to receive points for this lab the student must do the following:

1. Compile and run your code (we must see it compile and execute successfully).
2. Valgrind output with leak-check and mem-check showing no memory leaks.
    a. Valgrind output to the console is fine. Fist compile your code with the -g flag then run the following: **valgrind --leak-check=full --tool=memcheck ./a.out**.
3. Submit your lab 5 folder as a tar.gz to Canvas.
    a. The submission must take place before the end of the lab period.