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//Andrew Ingle 04/07/2021 - Team I - Final Project
//Main Driver Programmer for Server, will fork and execute to create servers
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#include <stdio.h>
#include <stdlib.h>
#include <unistd.h>
#include <sys/types.h>
#include <sys/wait.h>
#include <sys/stat.h>
#include <fcntl.h>
#include <errno.h>
#include <string.h>

#include <sys/socket.h>
#include <arpa/inet.h>
#include <netinet/in.h>
#include "caleb_server.h"
```

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int main() {

    printf("\nServer Driver is Alive and Creating 3 Servers!\n"); //for
        debugging

    int server_name = 1; //name of first server will be incremented as we go
        along

    unlink("myfifo1");
    if (mkfifo("myfifo1", 0666)==-1){        //Create Fifo to send server names to
        child servers
        printf("Could not create fifo file\n");
        perror("mkfifo() failed");
        return 1;
    }

    // Semaphore Synchronization start //CALEB ADDED SEMAPHORE CODE
    sem_unlink(SEM_READER_NAME);
    sem_unlink(SEM_WRITER_NAME);
    //We initialize the semaphore counter to (INITIAL_VALUE) in caleb_server.h
    sem_t *read_semaphore = sem_open(SEM_READER_NAME, O_CREAT | O_EXCL,
        SEM_PERMS, INITIAL_VALUE_READER);
    sem_t *write_semaphore = sem_open(SEM_WRITER_NAME, O_CREAT | O_EXCL,
        SEM_PERMS, INITIAL_VALUE_WRITER);

    if (read_semaphore == SEM_FAILED || write_semaphore == SEM_FAILED) {
        perror("sem_open(3) error");
        exit(EXIT_FAILURE);
    }
}
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}

//Close the semaphore as we won't be using it in the parent process
if (sem_close(write_semaphore) < 0 && sem_close(read_semaphore) < 0) {
    perror("sem_close(3) failed");
    // We ignore possible sem_unlink(3) errors here
    sem_unlink(SEM_READER_NAME);
    sem_unlink(SEM_WRITER_NAME);
    exit(EXIT_FAILURE);
}
// Semaphore First part done


//creation of the socket to communicate with client
int server_socket, c;
server_socket = socket(AF_INET, SOCK_STREAM, 0);

if (server_socket == -1){
    printf("Could not create socket");
}

struct sockaddr_in server_address, client_address;
server_address.sin_family = AF_INET;
server_address.sin_addr.s_addr = INADDR_ANY;

server_address.sin_port = htons(8001); //for local connections

//Bind
if( bind(server_socket,(struct sockaddr *)&server_address ,
    sizeof(server_address)) < 0){
    printf("bind failed");
}

listen(server_socket, 5); //will update second number to reflect max number
    of customers allowed at a time

//creating 3 servers
for (int i = 0;i<3;i++){

    pid_t pid = fork();

    if(pid < 0) {
        fprintf(stderr, "fork failed for next server.");
        return 1;
    }
    else if(pid == 0) { //next child server
        // send port to server and change port each time
        execlp("./server_main","server_main",NULL); //system call provided by
            Andrew
    }
    sleep(1); //to give time for servers to open
}

```

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}

//opening fifo to send names to servers
int fd = open("myfifo1", 01); //this waits until child server has opened
    fifo
    if (fd== -1){
        return 1;
    }

//sending names to servers
for (int i=0;i<3;i++){
    write(fd, &server_name, sizeof(int));
    server_name++; //incrementing name
}

//sending server_socket id to servers
for (int i=0;i<3;i++){
    write(fd, &server_socket, sizeof(int));
}

sleep(3);
if ( sem_unlink(SEM_READER_NAME) < 0 || sem_unlink(SEM_WRITER_NAME) < 0){
    perror("sem_unlink(3) failed");
}
printf("\nserver_driver complete");

wait(NULL);

return 0;
}

```