**Operating Systems**

**University at Albany**

**Department of Computer Science**

**ICSI 412**

**Assignment-4**

**Assigned: Thursday, February 17th, 2022.**

**Due: Thursday, February 24th through your Blackboard account by 11:59 PM. Submissions**

**with 20% penalty will be accepted by Tuesday, March 1st, by 11:59 PM.**

## Student Name:

## OBJECTIVES

## To develop a C program that uses both fork() and pipe() process system calls to implement interprocess communication by means of file sharing.

## PROBLEM

You are to use the Ubuntu operating system or any other Linux distribution to create two C programs.

A program *consumer.c* to (1) read from a file containing integers and to (2) write to the display the even numbers and (3) the sum of the odd numbers found in the input file.



A program *producer.c* to (1) create a file with 20 integers and to (2) share this file with the consumer.



Both programs, the consumer and the producer, will communicate through a pipe. Your solution must include a child process which will execute your consumer program. Your shared file should be named *numbers.txt* and should be the only means of sharing information between your producer and consumer programs. You may use the *fork()*, pipe(), dup(), dup2(), read(), write(), creat(), as well as any of the *exec()* family of system calls.



## WHAT TO SUBMIT



The following are to be submitted through Blackboard:



Your source code for both the producer and the consumer, as well as any output produced by your solution that clearly shows the following:

1. The contents of the file *numbers.txt,* and
2. Information about pids of both parent and child, the file descriptor *fd* of your *numbers.txt* file, and a screenshot of the output of your consumer program. You are to use the following format to structure your output:
3. File *numbers.txt* fd is: *fd-of-numbers.txt.*
4. Contents of file *numbers.txt*: *a listing of the 20 integers.*
5. A screenshot of your terminal showing both (1) the even numbers returned by your consumer program as well as (2) the sum of the odd numbers.
6. Parent Process: My pid = *pid-of-parent*. I created child pid = *pid-of-child.*
7. Child Process: My pid = *pid-of-child*. My parent pid = *pid-of-parent.*

All above related files must be placed in a Compressed (zipped) folder (.zip). Your (.zip) folder must follow the format: *412 Programming* *Assignment 4 Your Name*. Marks will be deducted if you do not follow this requirement.

