**Assignment # 01**



**Fall 2023**

**CSE-302 Systems Programming**

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Date:

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**Department of Computer Systems Engineering**

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**SP Assignment # 1**

**Q1:** Write a program that searches for a file passed to it as a command line argument in all the provided paths. Take paths as CLA.

**Sample Run:**

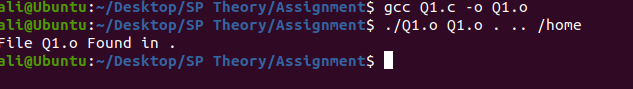
./find . .. ~/Desktop

**Code:**

**A screen shot of a computer code

Description automatically generated**

**Output:**

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**Q2:** Write a program to implement ls command. Take the name of the directory to be listed from command line. Also print the path of CWD.

**Sample Run:**

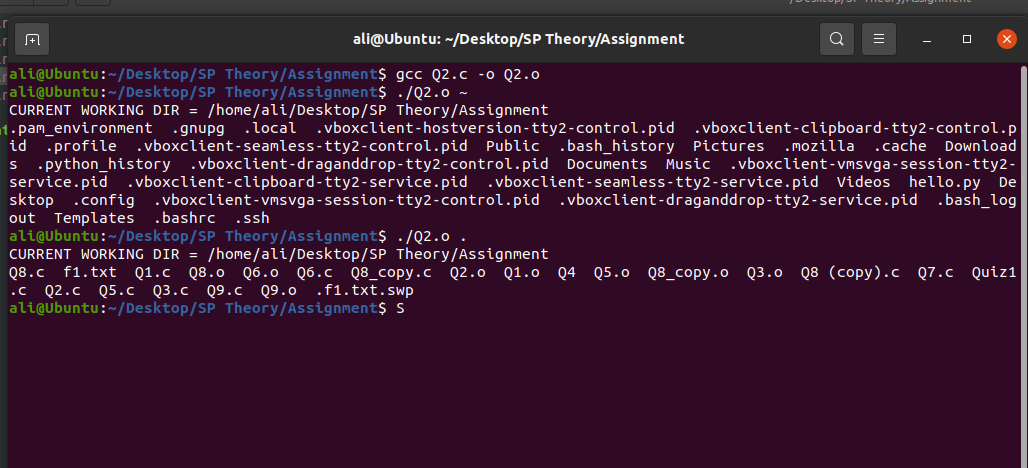
./t1.o SP

**Code:**

**A screenshot of a computer program

Description automatically generated**

**Output:**



**Q3:** Write a program that finds a file in a directory. Program shall receive the name of the file & directory from command line.

**Sample Run:**

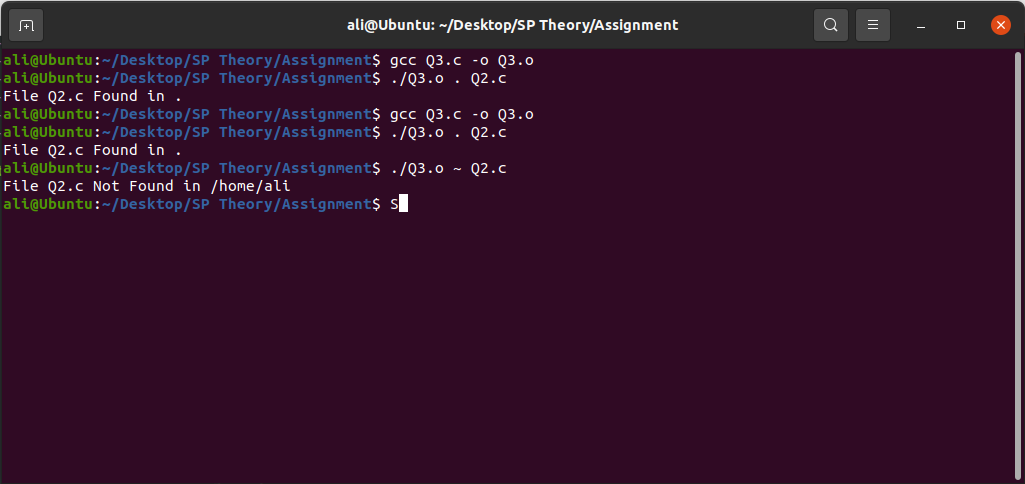
./find.o SP task1.c

**Code:**

**A screenshot of a computer

Description automatically generated**

**Output:**



**Q4:** Write a program that implements FTP Server. Client requests for the contents of a specific directory. Server responds with the list of files/directories.

**Using FIFOs**

**Code:**

**A screen shot of a computer

Description automatically generated**

**A screenshot of a computer

Description automatically generated**

Server Code

A screen shot of a computer screen

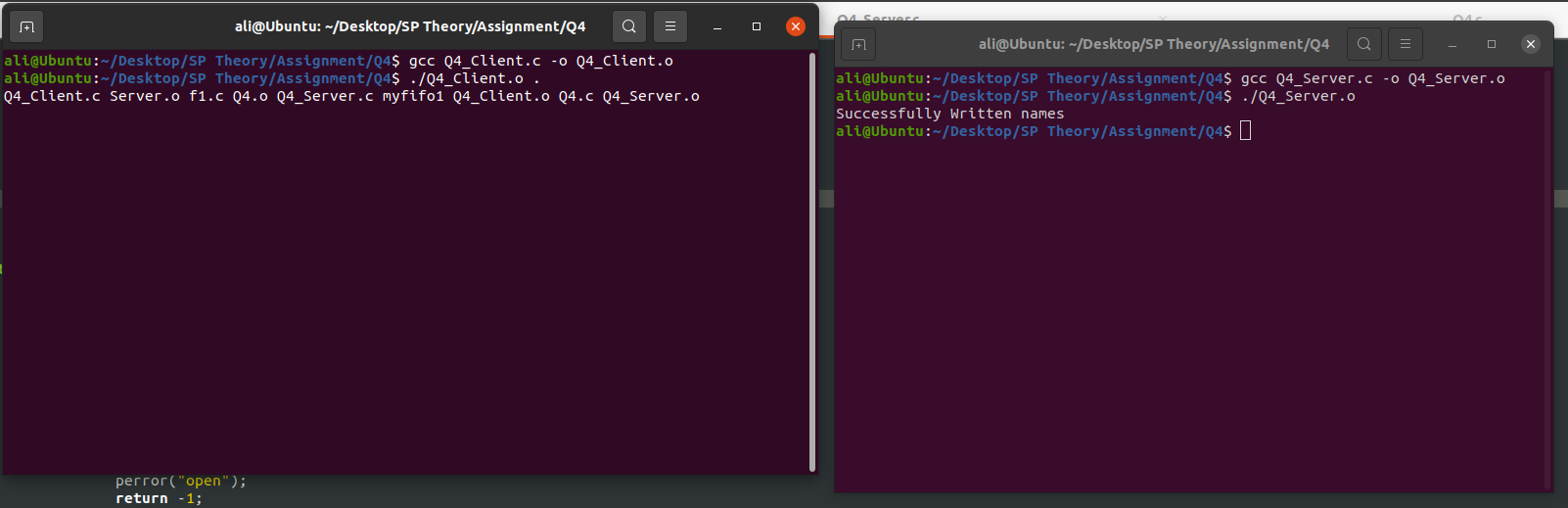
Description automatically generated

A screen shot of a computer program

Description automatically generated

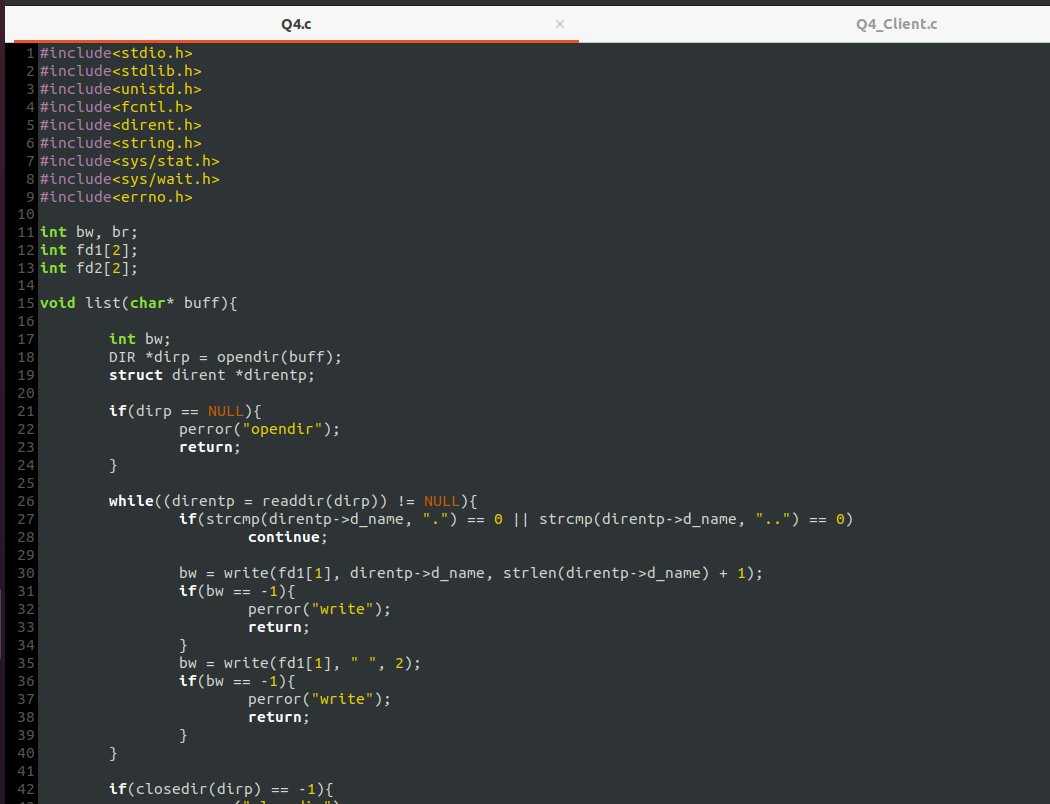
Client Code

**Output:**

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**Using Pipes**

**Code:**

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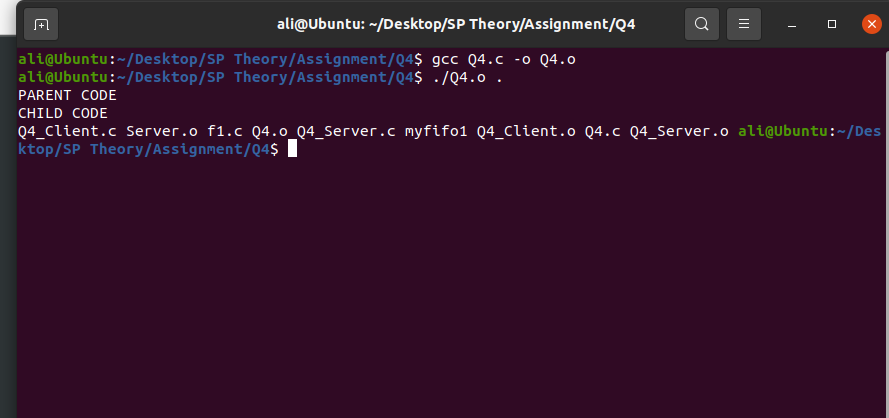
**A screen shot of a computer

Description automatically generated**

**A screen shot of a computer code

Description automatically generated**

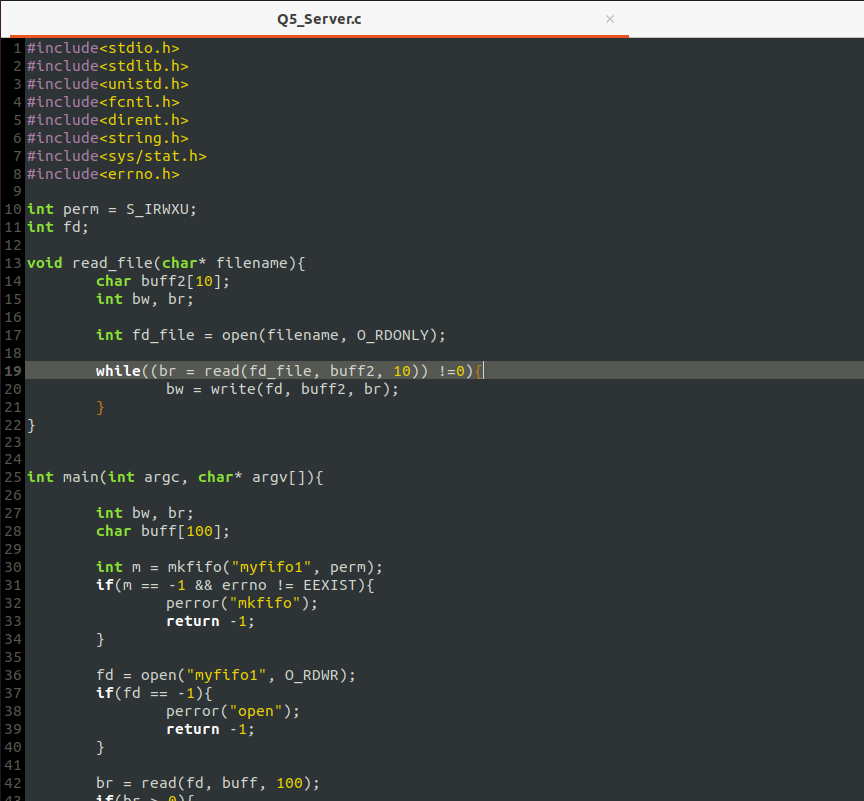
**Output:**

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**Q5:** Write a program that implements a simple FTP Server. Client requests for a file and server responds with the contents of the file. Client shall receive the contents and display on STD\_OUT.

**Code:**

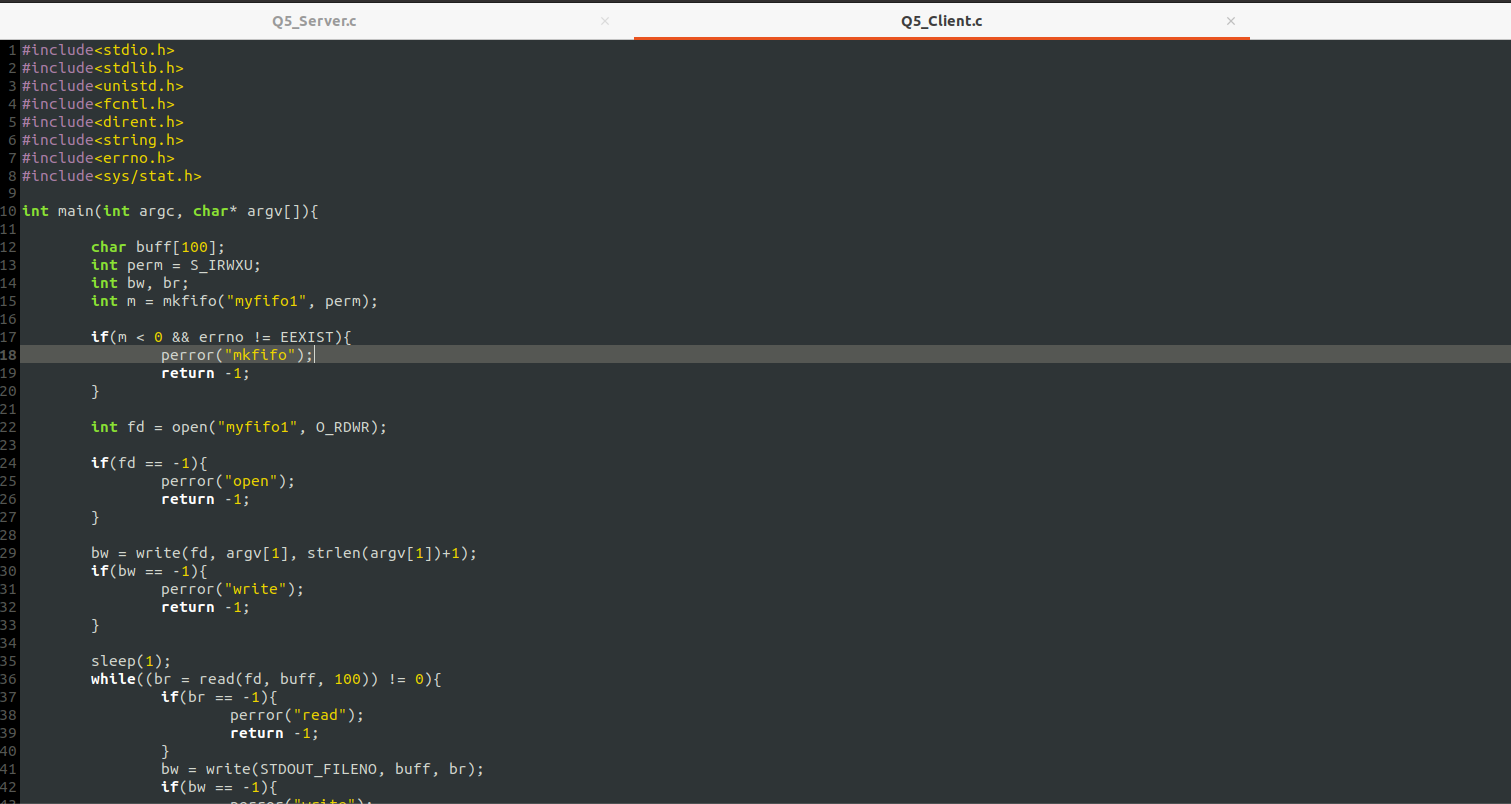
**Using FIFOs**

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**A screenshot of a computer program

Description automatically generated**

Server Code

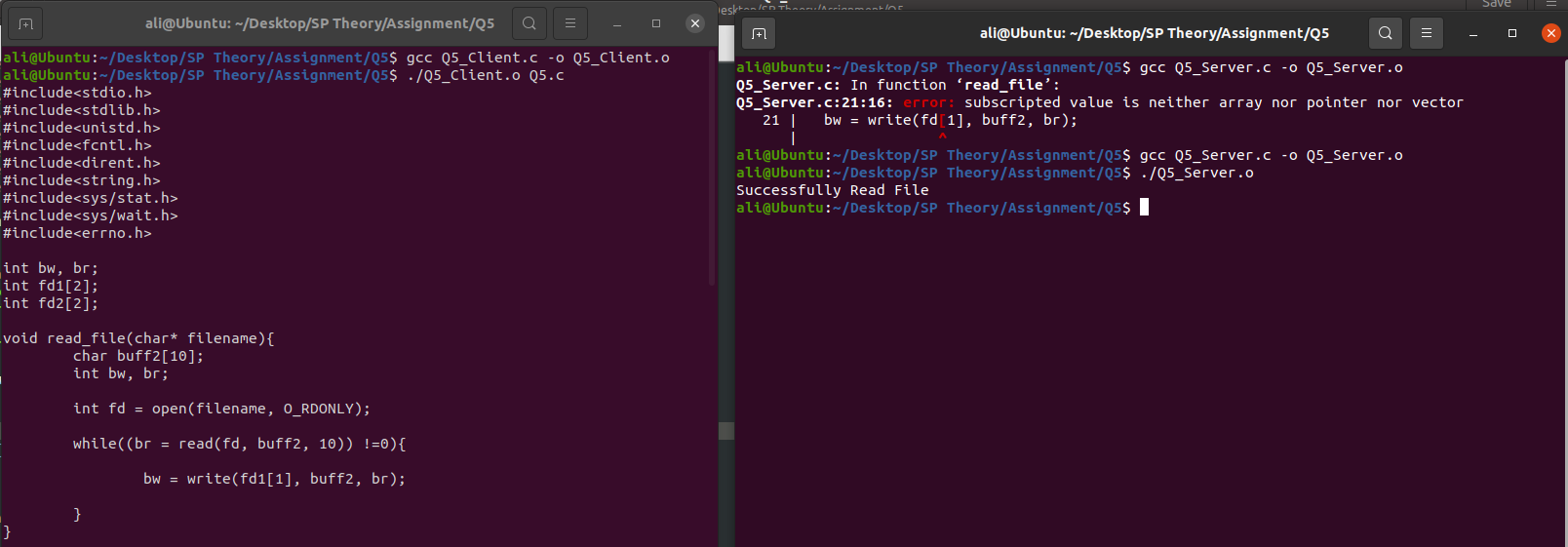


A screenshot of a computer program

Description automatically generated

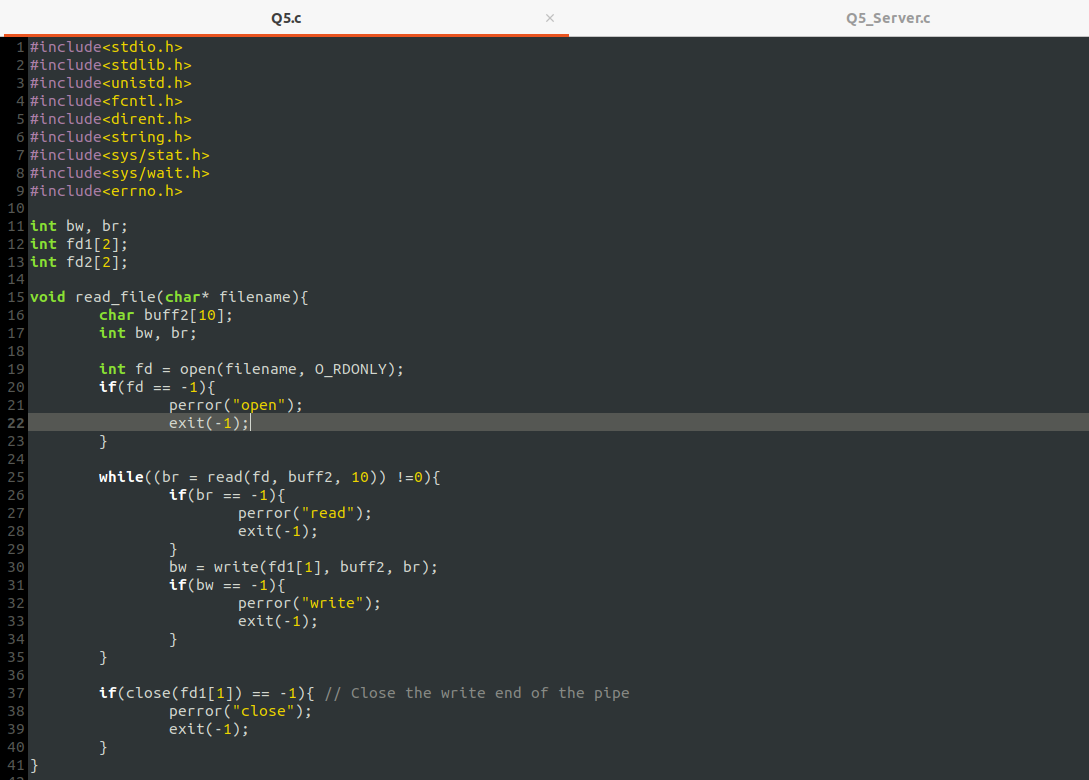
Client Code

**Output:**



**Using Pipes**

**Code:**

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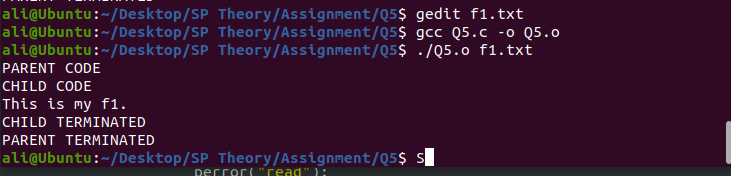
**A screen shot of a computer

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**A screen shot of a computer

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**Output:**

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A screenshot of a computer

Description automatically generated

**Q6:** Write a program for continuous communication (2-Way) between parent & child process using pipes.

**Code:**

**A screen shot of a computer program

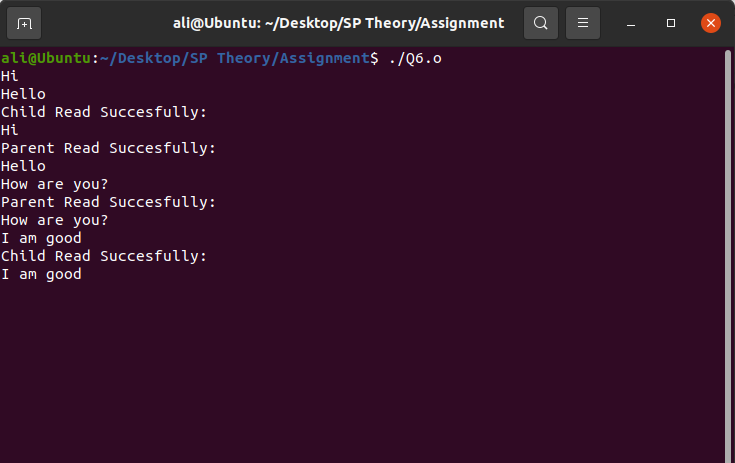
Description automatically generated**

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**A computer screen shot of a program code

Description automatically generated**

**Output:**

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**Q7:** Write a program for parallel array addition. The program must create 3 child processes and each child should calculate the sum of the one-third (1/3) of array elements. Parent process shall receive the sum calculated by each child, add them to get final sum and then display it. Make sure there are no orphan child processes.

You can use pipes, fifos or return value of child processes for Inter Process Communication.

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S3 calculated by Child 3

S2 calculated by Child 2

S1 calculated by Child 1



Parent Process => Sum = S1 + S2 + S3



**Code:**

**A screen shot of a computer screen

Description automatically generated**

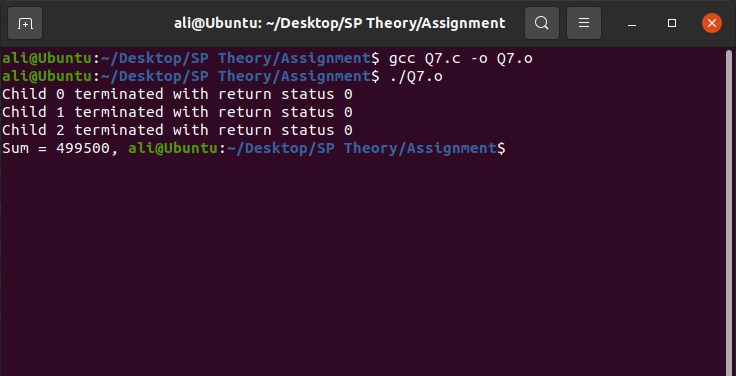
**A computer screen shot of a computer code

Description automatically generated**

**A screen shot of a computer program

Description automatically generated**

**Output:**

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**Q8:** Write a program that creates a child process. Child process shall send “N” SIGUSR1 or SIGUSR2 to parent process. Parent process shall count the number of SIGUSR2 received.

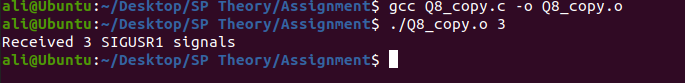
**Code:**

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**A screenshot of a computer program

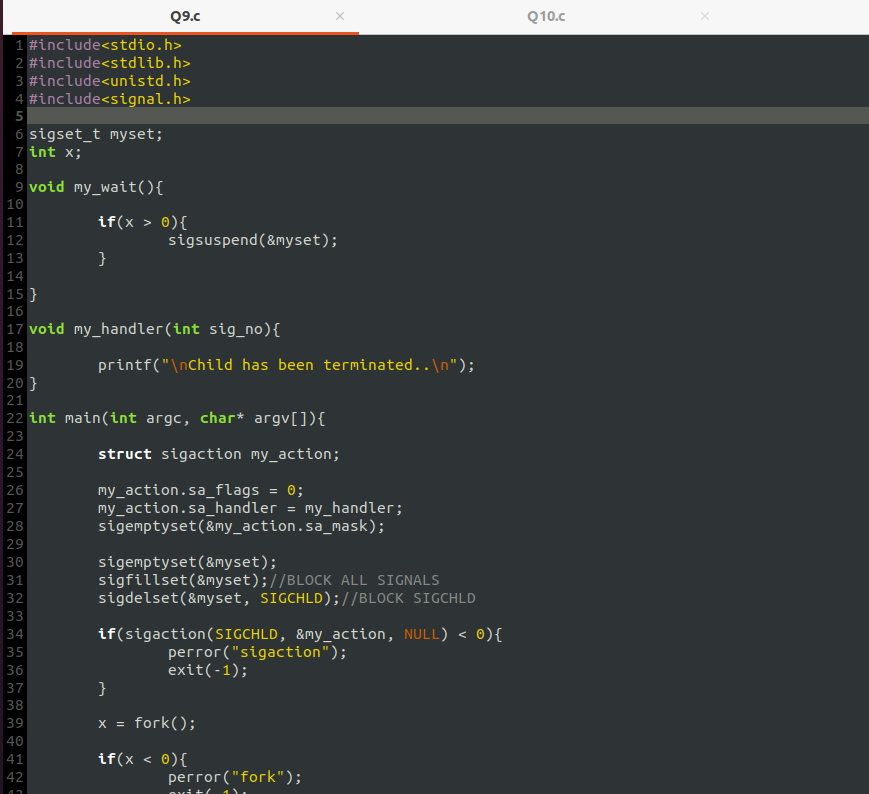
Description automatically generated**

**Output:**



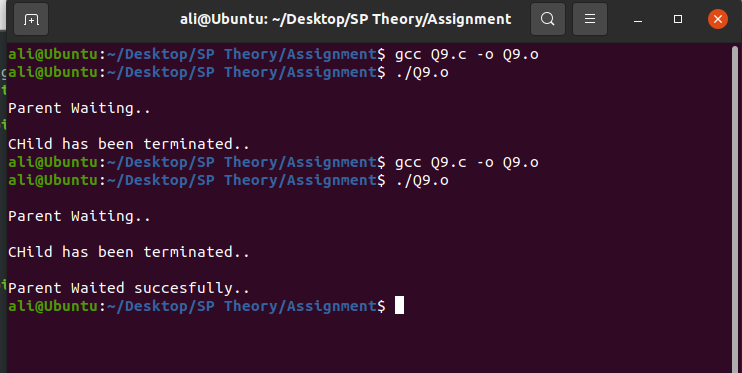
**Q9:** Write a program that creates a child process & waits for the child process to terminate using **pause/sigsuspend/sigwait.**

**Code:**

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**Output:**

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**Q10:** Write a program that creates 2 threads.

**Thread 1:** Find sum of array elements.

**Thread 2:** Searches for a key in array.

**Code:**

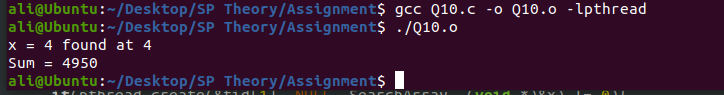
**A screen shot of a computer program

Description automatically generated**

**A screen shot of a computer program

Description automatically generated**

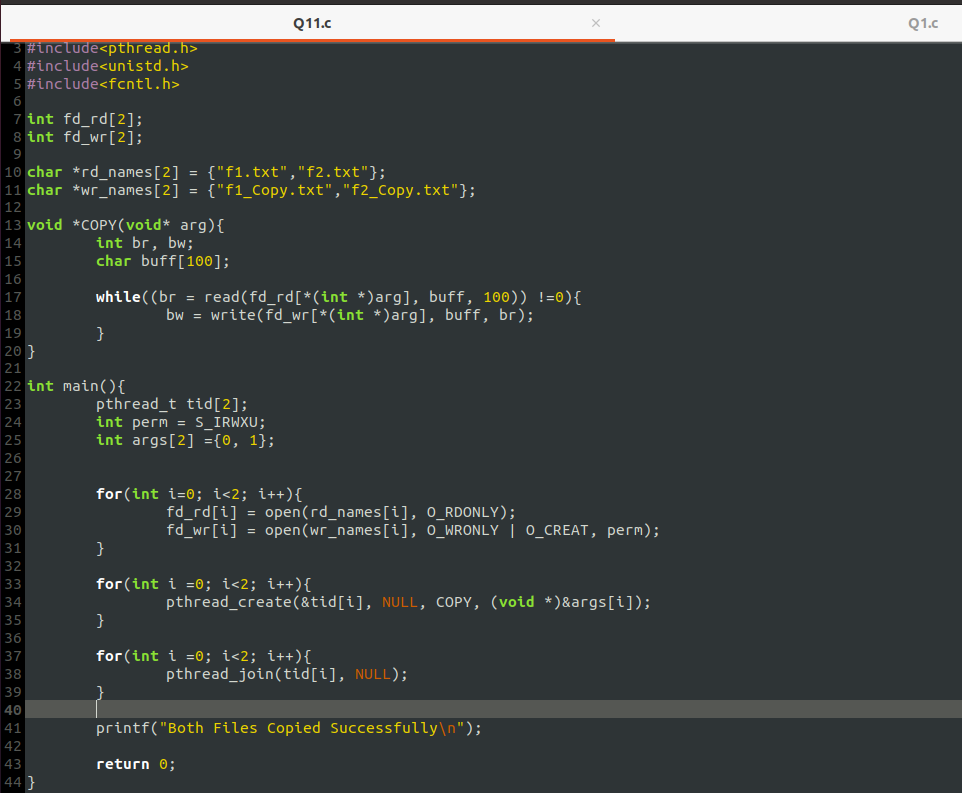
**Output:**



**Q11:** Write a multithreaded program for parallel file copying. Open both source files in master thread before creating threads.

|  |  |
| --- | --- |
| **Thread 1** | **Thread 2** |
| **S1 🡪 D1** | **S2 🡪 D2** |

**Code:**

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**Output:**

