Name: Tan Han Nguyen

NetID: TXN200004

Week 08 Lab 1

0. Log in

Pre-authentication banner message from server:

| University of Texas at Dallas

| Department of Computer Science

|

| Use of UTD Information Systems is subject to

| the UTD Information Security and Acceptable Use Policy.

|

| Pursuant to Texas Administrative Code 202:

| (1) Unauthorized use is prohibited;

| (2) Usage may be subject to security testing and monitoring;

| (3) Misuse is subject to criminal prosecution; and

| (4) No expectation of privacy except as otherwise provided by applicable

| privacy laws.

|

| ATTENTION: utdnetid != utdnetid@utdallas.edu (UTD != Google!)

|

| \*\*\*\*\* This system will require a connection to the GlobalProtect VPN startin

> g

| on the following dates:

|

| cslinux1.utdallas.edu - June 15, 2020

| cslinux2.utdallas.edu - June 22, 2020

|

| \*\*\*\*\* GlobalProtect VPN Instructions: https://www.utdallas.edu/oit/howto/vpn

> /

|

End of banner message from server

Keyboard-interactive authentication prompts from server:

| Password:

End of keyboard-interactive prompts from server

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│ • MobaXterm Personal Edition v24.2 • │

│ (SSH client, X server and network tools) │

│ │

│ ⮞ SSH session to txn200004@cslinux2.utdallas.edu │

│ • Direct SSH : ✓ │

│ • SSH compression : ✓ │

│ • SSH-browser : ✓ │

│ • X11-forwarding : ✓ (remote display is forwarded through SSH) │

│ │

│ ⮞ For more info, ctrl+click on help or visit our website. │

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Last login: Thu Oct 10 14:46:47 2024 from 10.176.201.252

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csgrads1.utdallas.edu - CentOS Linux 7.9

--All CS Graduate Students should use csgrads1--

cs1.utdallas.edu - CentOS Linux 7.9

cs2.utdallas.edu - CentOS Linux 7.9

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This system is for use by CS students who need a general purpose Linux system

to complete homework assignments. Computationally or resource intensive

simulations will be throttled automatically.

Thank you,

CS Lab Manager

cs-labs@utdallas.edu

/scratch disk space can be used for temporary files.

All files within /scratch will be erased on a regular basis (Sunday 0300).

Create Folder

{cslinux2:~} mkdir week08Lab1; cd week08Lab1

1. Design and Implement tryFork.c

{cslinux2:~/week08Lab1} vim tryFork.c

Print tryFork.c for Grader to check

{cslinux2:~/week08Lab1} cat tryFork.c

#include <stdio.h>

#include <stdlib.h>

#include <unistd.h>

#include <sys/types.h>

#include <sys/wait.h>

int main(int argc, char\*\* argv){

if(argc != 2){

fprintf(stderr, "Usage: %s <number of child>\n", argv[0]);

return 1;

}

printf("Name: Tan Han Nguyen\nNetID: TXN200004\nCourse/section: SE3377.001\nLab: Week 08 Lab 1\n");

system("date;whoami;ps;ls -l"); //print header

int caseNum = atoi(argv[1]); // capture argument to in

printf("Case Number: %d\n", caseNum);

pid\_t ppid = getppid(); //Store the parent's parent ID to use later at the end

switch(caseNum) {

case 1:

fork(); // Creates 1 child process

printf("PID: %d, Parent PID: %d\n", getpid(), getppid());

break;

case 2:

fork();

fork();

printf("PID: %d, Parent PID: %d\n", getpid(), getppid());

break;

case 3:

fork();

fork();

fork();

printf("PID: %d, Parent PID: %d\n", getpid(), getppid());

break;

case 4:

if (fork() && fork()) {

fork();

}

if (fork() && fork()) {

fork();

}

if (fork() && fork()) {

fork();

}

printf("PID: %d, Parent PID: %d\n", getpid(), getppid());

break;

case 5:

for (int i = 1; i < 5; i++) {

fork(); // Loop to fork 4 times

}

printf("PID: %d, Parent PID: %d\n", getpid(), getppid());

break;

default:

fprintf(stderr, "Invalid argument (1 - 5)\n");

return 1;

}

// Wait for all child processes to finish

while (wait(NULL) > 0);

// Print termination statement

if(getppid() == ppid){

printf("End of tryFork for case #%d (PID: %d)\n", caseNum, getpid());

}

return 0;

}

2. Compile and run all cases for tryFork.c

{cslinux2:~/week08Lab1} gcc tryFork.c -o tryFork -std=gnu99

Case #1:

{cslinux2:~/week08Lab1} ./tryFork 1

Name: Tan Han Nguyen

NetID: TXN200004

Course/section: SE3377.001

Lab: Week 08 Lab 1

Thu Oct 10 20:57:21 CDT 2024

txn200004

PID TTY TIME CMD

17732 pts/0 00:00:00 bash

18000 pts/0 00:00:00 tryFork

18001 pts/0 00:00:00 sh

18004 pts/0 00:00:00 ps

total 48

-rwx--x--x 1 txn200004 se 8848 Oct 10 20:57 tryFork

-rw------- 1 txn200004 se 2235 Oct 10 20:54 tryFork.c

Case Number: 1

PID: 18000, Parent PID: 17732

PID: 18006, Parent PID: 18000

End of tryFork for case #1 (PID: 18000)

Total 2 processes

Case #2

{cslinux2:~/week08Lab1} ./tryFork 2

Name: Tan Han Nguyen

NetID: TXN200004

Course/section: SE3377.001

Lab: Week 08 Lab 1

Thu Oct 10 20:57:26 CDT 2024

txn200004

PID TTY TIME CMD

17732 pts/0 00:00:00 bash

18007 pts/0 00:00:00 tryFork

18008 pts/0 00:00:00 sh

18011 pts/0 00:00:00 ps

total 48

-rwx--x--x 1 txn200004 se 8848 Oct 10 20:57 tryFork

-rw------- 1 txn200004 se 2235 Oct 10 20:54 tryFork.c

Case Number: 2

PID: 18007, Parent PID: 17732

PID: 18014, Parent PID: 18007

PID: 18013, Parent PID: 18007

PID: 18015, Parent PID: 18013

End of tryFork for case #2 (PID: 18007)

Total 4 processes

Case #3

{cslinux2:~/week08Lab1} ./tryFork 3

Name: Tan Han Nguyen

NetID: TXN200004

Course/section: SE3377.001

Lab: Week 08 Lab 1

Thu Oct 10 20:57:34 CDT 2024

txn200004

PID TTY TIME CMD

17732 pts/0 00:00:00 bash

18016 pts/0 00:00:00 tryFork

18017 pts/0 00:00:00 sh

18020 pts/0 00:00:00 ps

total 48

-rwx--x--x 1 txn200004 se 8848 Oct 10 20:57 tryFork

-rw------- 1 txn200004 se 2235 Oct 10 20:54 tryFork.c

Case Number: 3

PID: 18016, Parent PID: 17732

PID: 18024, Parent PID: 18016

PID: 18023, Parent PID: 18016

PID: 18026, Parent PID: 18023

PID: 18022, Parent PID: 18016

PID: 18025, Parent PID: 18022

PID: 18028, Parent PID: 18025

PID: 18027, Parent PID: 18022

End of tryFork for case #3 (PID: 18016)

Total 8 processes

Case #4

{cslinux2:~/week08Lab1} ./tryFork 4

Name: Tan Han Nguyen

NetID: TXN200004

Course/section: SE3377.001

Lab: Week 08 Lab 1

Thu Oct 10 20:57:40 CDT 2024

txn200004

PID TTY TIME CMD

17732 pts/0 00:00:00 bash

18030 pts/0 00:00:00 tryFork

18031 pts/0 00:00:00 sh

18034 pts/0 00:00:00 ps

total 48

-rwx--x--x 1 txn200004 se 8848 Oct 10 20:57 tryFork

-rw------- 1 txn200004 se 2235 Oct 10 20:54 tryFork.c

Case Number: 4

PID: 18046, Parent PID: 18039

PID: 18048, Parent PID: 18041

PID: 18049, Parent PID: 18040

PID: 18041, Parent PID: 18037

PID: 18064, Parent PID: 18042

PID: 18062, Parent PID: 18044

PID: 18039, Parent PID: 18036

PID: 18036, Parent PID: 18030

PID: 18042, Parent PID: 18036

PID: 18061, Parent PID: 18037

PID: 18040, Parent PID: 18030

PID: 18071, Parent PID: 18039

PID: 18045, Parent PID: 18037

PID: 18030, Parent PID: 17732

PID: 18075, Parent PID: 18036

PID: 18037, Parent PID: 18030

PID: 18082, Parent PID: 18030

PID: 18063, Parent PID: 18036

PID: 18069, Parent PID: 18045

PID: 18053, Parent PID: 18042

PID: 18066, Parent PID: 18041

PID: 18074, Parent PID: 18040

PID: 18081, Parent PID: 18037

PID: 18047, Parent PID: 18036

PID: 18050, Parent PID: 18030

PID: 18038, Parent PID: 18030

PID: 18070, Parent PID: 18037

PID: 18077, Parent PID: 18042

PID: 18054, Parent PID: 18036

PID: 18058, Parent PID: 18030

PID: 18083, Parent PID: 18044

PID: 18043, Parent PID: 18030

PID: 18093, Parent PID: 18051

PID: 18090, Parent PID: 18038

PID: 18044, Parent PID: 18038

PID: 18057, Parent PID: 18045

PID: 18060, Parent PID: 18040

PID: 18055, Parent PID: 18039

PID: 18094, Parent PID: 18051

PID: 18079, Parent PID: 18047

PID: 18088, Parent PID: 18047

PID: 18056, Parent PID: 18041

PID: 18051, Parent PID: 18037

PID: 18095, Parent PID: 18051

PID: 18067, Parent PID: 18047

PID: 18085, Parent PID: 18043

PID: 18068, Parent PID: 18050

PID: 18080, Parent PID: 18045

PID: 18089, Parent PID: 18050

PID: 18072, Parent PID: 18030

PID: 18096, Parent PID: 18052

PID: 18059, Parent PID: 18043

PID: 18078, Parent PID: 18038

PID: 18065, Parent PID: 18038

PID: 18087, Parent PID: 18065

PID: 18098, Parent PID: 18052

PID: 18076, Parent PID: 18044

PID: 18073, Parent PID: 18043

PID: 18091, Parent PID: 18065

PID: 18092, Parent PID: 18065

PID: 18084, Parent PID: 18050

PID: 18086, Parent PID: 18038

PID: 18097, Parent PID: 18052

PID: 18052, Parent PID: 18038

End of tryFork for case #4 (PID: 18030)

Total 64 processes

Case #5

{cslinux2:~/week08Lab1} ./tryFork 5

Name: Tan Han Nguyen

NetID: TXN200004

Course/section: SE3377.001

Lab: Week 08 Lab 1

Thu Oct 10 20:57:44 CDT 2024

txn200004

PID TTY TIME CMD

17732 pts/0 00:00:00 bash

18102 pts/0 00:00:00 tryFork

18103 pts/0 00:00:00 sh

18106 pts/0 00:00:00 ps

total 48

-rwx--x--x 1 txn200004 se 8848 Oct 10 20:57 tryFork

-rw------- 1 txn200004 se 2235 Oct 10 20:54 tryFork.c

Case Number: 5

PID: 18102, Parent PID: 17732

PID: 18109, Parent PID: 18102

PID: 18115, Parent PID: 18102

PID: 18116, Parent PID: 18109

PID: 18112, Parent PID: 18108

PID: 18108, Parent PID: 18102

PID: 18119, Parent PID: 18112

PID: 18120, Parent PID: 18110

PID: 18113, Parent PID: 18109

PID: 18111, Parent PID: 18102

PID: 18121, Parent PID: 18113

PID: 18110, Parent PID: 18108

PID: 18122, Parent PID: 18114

PID: 18117, Parent PID: 18108

PID: 18118, Parent PID: 18111

PID: 18114, Parent PID: 18110

End of tryFork for case #5 (PID: 18102)

Total 16 processes

End Lab and Exit

{cslinux2:~/week08Lab1} date

Thu Oct 10 20:59:36 CDT 2024

{cslinux2:~/week08Lab1} ls -l

total 48

-rwx--x--x 1 txn200004 se 8848 Oct 10 20:57 tryFork

-rw------- 1 txn200004 se 2235 Oct 10 20:54 tryFork.c

{cslinux2:~/week08Lab1} uname -a

Linux cslinux2.utdallas.edu 3.10.0-1160.119.1.el7.x86\_64 #1 SMP Tue Jun 4 14:43:51 UTC 2024 x86\_64 x86\_64 x86\_64 GNU/Linux

{cslinux2:~/week08Lab1} exit

logout

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Session stopped

- Press <Return> to exit tab

- Press R to restart session

- Press S to save terminal output to file