Christiaan Cronje

Lab 6 Option B

COSC 2347 8AM

Due: April 28, 2017

Submitted: April 28, 2017

**pipes.c (C Option)**

#include <stdio.h>

#include <stdlib.h>

#include <wait.h>

#include <unistd.h>

#include <time.h>

#include <string.h>

#include "randapi.h"

void PrintCurrentTime();

int main() // Bridge

{

char bufferw[50], bufferr[50];

float lifeDur = 0, envDur = 0, navDur = 0;

// create pipe

int myPipe[2];

if (pipe(myPipe) < 0)

{

printf("Pipe creation unsuccessful!\n");

exit(1);

}

// seed random number generator

seedRandGenerator();

if (fork() == 0) // create navigation, child 1

{

close(myPipe[0]);

if (fork() == 0) // create life support – child 2

{

// life support code

lifeDur = getRandExponential() \* 5;

sprintf(bufferw, "Adjusted life support systems: %.2fs", lifeDur);

sleep(lifeDur);

write(myPipe[1], bufferw, 50);

envDur = getRandExponential() \* 4;

sprintf(bufferw, "Adjusted Environment control systems: %.2fs", envDur);

sleep(envDur);

write(myPipe[1], bufferw, 50);

}

else

{

// navigation code

navDur = getRandFloat() \* 6;

sprintf(bufferw, "Adjusted navigation systems: %.2fs", navDur);

sleep(navDur);

write(myPipe[1], bufferw, 50);

}

//END CHILD - termination of life function.

}

else // bridge

{

printf("Bridge starting...\n");

PrintCurrentTime();

printf("\n");

close(myPipe[1]);

read(myPipe[0], bufferr, 50);

printf("%s\n", bufferr);

PrintCurrentTime();

printf("\n");

read(myPipe[0], bufferr, 50);

printf("%s\n", bufferr);

PrintCurrentTime();

printf("\n");

read(myPipe[0], bufferr, 50);

printf("%s\n", bufferr);

PrintCurrentTime();

printf("\n");

}

return 0;

} // end program

void PrintCurrentTime()

{

time\_t currentTime;

struct tm \*curTime;

time(&currentTime);

curTime = localtime(&currentTime);

printf("Current Time: %d:%d:%d\n", curTime->tm\_hour, curTime->tm\_min, curTime->tm\_sec);

return;

}

**C Output**

stian@ubuntu:~/Dropbox/SHSU/SpecialTopics/Labs/Lab6$ ./pipes

Bridge starting...

Current Time: 23:49:2

Adjusted navigation systems: 5.12s

Current Time: 23:49:7

Adjusted life support systems: 9.65s

Current Time: 23:49:11

Adjusted Environment control systems: 0.97s

Current Time: 23:49:11

**bridge.c**

#include <stdio.h>

#include <stdlib.h>

#include <wait.h>

#include <unistd.h>

#include <time.h>

#include <string.h>

#include "randapi.h"

#include <sys/stat.h>

#include <fcntl.h>

void PrintCurrentTime();

int main() // Bridge

{

char bufferr[50];

char \*sharedPipeName = "/tmp/FIFOpipe";

// seed random number generator from given library

seedRandGenerator();

int fd, ret = 0;

ret = mkfifo( sharedPipeName, 0666 );

fd = open( sharedPipeName, O\_RDONLY);

printf("Bridge starting...\n");

PrintCurrentTime();

printf("\n");

// repeats until it fails to read

while(ret != 0)

{

ret = read( fd, bufferr, sizeof(bufferr));

printf("%s\n", bufferr);

PrintCurrentTime();

printf("\n");

}

return 0;

}

void PrintCurrentTime()

{

time\_t currentTime;

struct tm \*curTime;

time(&currentTime);

curTime = localtime(&currentTime);

printf("Current Time: %d:%d:%d\n", curTime->tm\_hour, curTime->tm\_min, curTime->tm\_sec);

return;

}

**lifesupport.c**

#include <stdio.h>

#include <stdlib.h>

#include <wait.h>

#include <unistd.h>

#include <time.h>

#include <string.h>

#include "randapi.h"

#include <sys/stat.h>

#include <fcntl.h>

int main() // Bridge

{

char bufferw[50];

char \*sharedPipeName = "/tmp/FIFOpipe";

float lifeDur = 0, envDur = 0;

// seed random number generator from given library

seedRandGenerator();

int fd, ret = 0;

ret = mkfifo( sharedPipeName, 0666 );

fd = open( sharedPipeName, O\_WRONLY);

// life support code

while(1)

{

lifeDur = getRandExponential() \* 5;

sprintf(bufferw, "Adjusted life support systems: %.2fs", lifeDur);

// simulate life support work time

sleep(lifeDur);

write(fd, bufferw, sizeof(bufferw));

envDur = getRandExponential() \* 4;

sprintf(bufferw, "Adjusted Environment control systems: %.2fs", envDur);

// simulate environment control work time

sleep(envDur);

write(fd, bufferw, sizeof(bufferw));

sleep(30);

}

close(fd);

return 0;

}

**navigation.c**

#include <stdio.h>

#include <stdlib.h>

#include <wait.h>

#include <unistd.h>

#include <time.h>

#include <string.h>

#include "randapi.h"

#include <sys/stat.h>

#include <fcntl.h>

int main() // Bridge

{

char bufferw[50];

char \*sharedPipeName = "/tmp/FIFOpipe";

float navDur = 0;

// seed random number generator from given library

seedRandGenerator();

int fd, ret = 0;

ret = mkfifo( sharedPipeName, 0666 );

fd = open( sharedPipeName, O\_WRONLY);

// navigation code

while(1)

{

navDur = getRandFloat() \* 6;

sprintf(bufferw, "Adjusted navigation systems: %.2fs", navDur);

// simulate navigations work time

sleep(navDur);

write(fd, bufferw, sizeof(bufferw));

sleep(30);

}

close(fd);

return 0;

}

stian@ubuntu:~/Dropbox/SHSU/SpecialTopics/Labs/Lab6$ ./bridge

Bridge starting...

Current Time: 23:49:24

Adjusted navigation systems: 2.76s

Current Time: 23:49:28

Adjusted life support systems: 3.08s

Current Time: 23:49:29

Adjusted Environment control systems: 0.57s

Current Time: 23:49:29

Adjusted navigation systems: 0.80s

Current Time: 23:49:58

Adjusted life support systems: 6.63s

Current Time: 23:50:5

Adjusted Environment control systems: 1.93s

Current Time: 23:50:6

Adjusted navigation systems: 4.41s

Current Time: 23:50:32

Adjusted life support systems: 4.33s

Current Time: 23:50:40

Adjusted Environment control systems: 7.59s

Current Time: 23:50:47

Adjusted navigation systems: 2.30s

Current Time: 23:51:4

Adjusted life support systems: 4.03s

Current Time: 23:51:21

Adjusted Environment control systems: 1.19s

Current Time: 23:51:22

Adjusted navigation systems: 3.47s

Current Time: 23:51:37

Adjusted life support systems: 13.23s

Current Time: 23:52:5

Adjusted Environment control systems: 1.21s

Current Time: 23:52:6

Adjusted navigation systems: 5.10s

Current Time: 23:52:12