#include <stdio.h>

#include <stdlib.h>

#include <pthread.h>

#include <semaphore.h>

#include <stdint.h>

#include <unistd.h>

#define R 5

#define W 5

int readcount;

int writecount;

//sem\_t x;

//sem\_t y,z;

pthread\_mutex\_t x;

sem\_t wsem,y; //mutual exclusion

int s=5;

void \*reader1(void \*a);

void \*writer1(void \*a);

//void \*reader2(void \*a);

//void \*writer2(void \*a);

int main()

{

int i,op;

pthread\_t thread\_read[R],thread\_write[W];

//sem\_init(&x,0,1);

pthread\_mutex\_init(&x,NULL); //initializeed to default value

sem\_init(&wsem,0,1);

sem\_init(&y,0,1);

// sem\_init(&rsem,0,1);

// sem\_init(&z,0,1);

do{

printf("Menu : 1. Readers have priority 2. exit ");

scanf("%d",&op);

switch(op)

{

case 1:readcount=0;

for(i=0;i<W;i++)

{

pthread\_create(&thread\_write[i],NULL, \*writer1,(void \*) (intptr\_t) i);

}

for(i=0;i<R;i++)

{

pthread\_create(&thread\_read[i],NULL, \*reader1,(void \*) (intptr\_t) i);

}

for(i=0;i<W;i++)

{

pthread\_join(thread\_write[i],NULL);

}

for(i=0;i<R;i++)

{

pthread\_join(thread\_read[i],NULL);

}

break;

/\* case 2:readcount=0;

writecount = 0;

for(i=0;i<W;i++)

{

pthread\_create(&thread\_write[i],NULL, \*writer2,(void \*) (intptr\_t) i);

}

for(i=0;i<R;i++)

{

pthread\_create(&thread\_read[i],NULL, \*reader2,(void \*) (intptr\_t) i);

}

for(i=0;i<W;i++)

{

pthread\_join(thread\_write[i],NULL);

}

for(i=0;i<R;i++)

{

pthread\_join(thread\_read[i],NULL);

}

break;\*/

case 2: break;

}

}while(op!=2);

}

void \*reader1(void \*a)

{

//int r=(int)a;

int r = (intptr\_t) a;

int i=0;

while (i<5){

//sleep(rand() % 10);

//sem\_wait(&x);

pthread\_mutex\_lock(&x);

readcount++;

if(readcount == 1)

sem\_wait(&wsem);

//sem\_post(&x);

pthread\_mutex\_unlock(&x);

printf("\t\tReader %d is reading : %d \n",r,s);

//sem\_wait(&x);

pthread\_mutex\_lock(&x);

readcount--;

if(readcount == 0)

sem\_post(&wsem);

//sem\_post(&x);

pthread\_mutex\_unlock(&x);

sleep(rand() % 10);

i++;

}

}

void \*writer1(void \*a)

{

int w = (intptr\_t) a;

//int w=(int)a;

int i=0;

while (i<2){

//sleep(rand() % 10);

sem\_wait(&wsem);

s+=5;

printf("Writer %d is writing : %d \n",w,s);

sem\_post(&wsem);

sleep(rand() % 10);

i++;

}

}

