**Arfah Ali**

**FA21-bse-080**

**Activity 1**

#include<iostream> #include<pthread.h>

using namespace std;

int counter=0; // shared data

void \*Thread1(void \*args) // routine executed by thread 1

{

for (int i=0; i<=5000000; i++)

{

counter++;

if(counter %1000000==0)

cout<<"Value of counter from Thread 1 is: "<<counter<<endl;

}

}

void \*Thread2 (void \*args) // routine executed by thread 2

{

for(int i=0; i<=5000000; i++)

{

counter--;

if(counter %1000000==0)

cout<<"Value of counter from Thread 2 is: "<<<counter<<endl;

}

1}

int main()

C

pthread\_t t1, t2;

pthread\_create(&t1, NULL, Thread1, NULL); pthread\_create(&t2, NULL, Thread2, NULL);

pthread\_join(t1, NULL);

pthread\_join(t2, NULL);

cout<<"The final value of counter is "<<counter<<endl;

return 0;

}

**Activity 2**

#include<iostream>

#include<pthread.h> using namespace std;

int turn=0; // turn variable int counter=0;

void thread1(void\* args)

{

while(turn==2); // Entry Code for(int i=0; i<=5000000; i++)

{

counter++;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 1 is "<<counter<<endl;

}

turn=2; // Exit code

}

void \*thread2 (void\* args)

{

while(turn==1); //Entry code for(int i=0; i<=5000000; i++)

{

counter--;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 2 is "<<counter<<endl;

turn=1; //Exit code

}

}

int main()

pthread\_t t1, t2;

pthread\_create(&t1, NULL, thread1, NULL);

pthread\_create(&t2, NULL, thread2, NULL);

pthread\_join(t1, NULL);

pthread\_join(t2, NULL);

cout<<"Final value of counter is: "<<<counter<<endl;

return 0;

}

**Activity 3**

#include<iostream> #include<pthread.h> using namespace std;

int turn=0; // turn variable int counter=0;

void thread1(void\* args)

/ / / / / / / / / / / / / / / / // /// CS1 //////// while(turn==2); // Entry Code

for (int i=0; i<=5000000; i++)

counter++;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 1 is "<<counter<<endl;

turn-2; // Exit code

while(turn==2); // Entry Code

for (int i=0; i<=5000000; i++)

counter++;

if(counter %1000000==0)

////////

cout<<"Value of Counter from Thread 1 ts "<<counter<<endl;

}

turn=2; // Exit code

while(turn==2); // Entry Code

for (int i=0; i<=5000000; i++)

{

counter++;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 1 is "<<counter<<endl;

turn=2; // Exit code

}

}

vold

thread2(void\* args)

while(turn==1); //Entry code for (int i=0; i<=5000000; i++)

{

counter;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 2 is "<<counter<<endl;

}

turn=1; //Exit code

int main()

{

pthread\_t t1, t2;

pthread\_create(&t1, NULL, thread1, NULL); pthread\_create(&t2, NULL, thread2, NULL); pthread\_join(t1, NULL);

pthread\_join(t2, NULL);

cout<<"Final value of counter is: "<<counter<<endl;

return 0;

**Activity 4**

#include<iostream>

#include<pthread.h>

using namespace std;

bool flag[3]={false, false, false); // flag array int turn=0; // turn variable

int counter=0;

vold thread1(void\* args)

flag[1]=true;

turn=2;

CS1 //////

while(flag [2] && turn==2); // Entry Code for (int i=0; i<=5000000; i++)

{

counter++;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 1 is "<<counter<<endl;

}

flag[1]=false; //Exit code

flag[1]=true;

turn=2;

while(flag [2]&&turn==2); // Entry Code

for (int i=0; i<=5000000;

counter++;

if(counter %1000000==0)

i++)

cout<<"Value of Counter from Thread 1 ts "<<counter<<endl; flag[1]=false; //Exit code

flag[1]=true;

turn=2;

while(flag [2]&&turn==2); // Entry Code

for (int i=0; i<=5000000; i++)

counter++;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 1 is "<<<counter<<endl; flag[1]=false; //Exit code

}

}

void thread2 (void\* args)

{

flag[2]=true;

turn=1;

while(flag[1]&&turn==1); // Entry Code for (int i=0; i<=5000000; i++)

counter--;

if(counter %1000000==0)

cout<<"Value of Counter from Thread 2 is "<<counter<<endl;

flag[2]=false; //Exit code

}

int main()

pthread\_t t1, t2;

pthread\_create(&t1, NULL, thread1, NULL); pthread\_create(&t2, NULL, threadz, NULL);

pthread\_join(t1, NULL);

pthread\_join(t2, NULL);

cout<<"Final value of counter is: "<<counter<<endl;

return 0;

}