Lab Assignment No: 04

Problem statement: Matrix operations using Threads.

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**Q. Implementation of multithreading for Matrix Operations using pthread.**

**Program:**

#include<stdio.h>

#include<pthread.h>

int mat1[100][100];

int mat2[100][100];

int trans[100][100];

int rows, cols;

void \*stat();

void \*transpose()

{

int i,j;

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

{

for(j=0; j<cols; j++)

{

trans[i][j]=mat1[j][i];

}

}

printf("Transpose of matrix 1 is \n");

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

{

for(j=0; j<cols; j++)

{

printf("%d\t",trans[i][j]);

}

printf("\n");

}

pthread\_exit(&stat);

}

void \*add(){

int i,j;

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

{

for(j=0; j<cols; j++)

printf("%d ",mat1[i][j]+mat2[i][j]);

printf("\n");

}

pthread\_exit(&stat);

}

void \*sub(){

int i,j;

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

{

for(j=0; j<cols; j++)

printf("%d ",mat1[i][j]-mat2[i][j]);

printf("\n");

}

pthread\_exit(&stat);

}

int main()

{

int i, j;

printf("Enter total Rows: ");

scanf("%d",&rows);

printf("Enter total Columns: ");

scanf("%d",&cols);

printf("\nEnter Matrix 1 (%d X %d):",rows,cols);

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

{

for(j=0; j<cols; j++)

{

scanf("%d", &mat1[i][j]);

}

}

printf("\nEnter Matrix 2 (%d X %d):",rows,cols);

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

{

for(j=0; j<cols; j++)

{

scanf("%d", &mat2[i][j]);

}

}

pthread\_t thread1, thread2 , thread3;

int ret1, ret2,ret3;

ret1 = pthread\_create(&thread1,NULL,add,NULL);

if(ret1 == 0)

printf("Thread 1 is created successfully!\n");

else

printf("Thread 1 is not created!");

pthread\_join(thread1,NULL);

ret2 = pthread\_create(&thread2,NULL,sub,NULL);

if(ret2 == 0)

printf("Thread 2 is created successfully!\n");

else

printf("Thread 2 is not created!");

pthread\_join(thread2,NULL);

ret3 = pthread\_create(&thread3,NULL,transpose,NULL);

if(ret3 == 0)

printf("Thread 3 is created successfully!\n");

else

printf("Thread 3 is not created!");

pthread\_join(thread3,NULL);

}

**Output:**

**adnan@Aspire-E15:~/Shell\_Scripting/Assignment/Assignment 4$ ./a.out**

**Enter total Rows: 2**

**Enter total Columns: 2**

**Enter Matrix 1 (2 X 2):2**

**3**

**4**

**5**

**Enter Matrix 2 (2 X 2):6**

**1**

**7**

**8**

**Thread 1 is created successfully!**

**8 4**

**11 13**

**Thread 2 is created successfully!**

**-4 2**

**-3 -3**

**Thread 3 is created successfully!**

**Transpose of matrix 1 is**

**2 4**

**3 5**

**adnan@Aspire-E15:~/Shell\_Scripting/Assignment/Assignment 4$**