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19BCE1027

1. Sample Circuit Satisfiability Program (solved)

```
#include <stdio.h>

#include <stdlib.h>

#include <time.h>

#include <mpi.h>

#include <math.h>

void generate(int);

void check(int,int);

int a[500];

int main ()

{

    int n=5,i;

    MPI_Init(NULL, NULL);

    int id,p;

    MPI_Comm_rank(MPI_COMM_WORLD,&id);

    MPI_Comm_size(MPI_COMM_WORLD,&p);

    int m = pow(2,n);

    generate(m);

    for(i=id;i<m;i+=p){

        check(id,i);

    }

    MPI_Finalize();
```

```

}

void generate(int m)

{
    int i;

    for(i=0;i<m;i++){

        a[i] = rand() % (1 - 0 + 1) + 0;

    }

}

void check(int id,int i)

{
    if(a[i]==1){

        printf("\n%dth row satisfies circuit",i);

    }

    else

    {

        printf("\n%dth row does not satisfies circuit\n",i);

    }

}

```

```
/home/mobaxterm/Desktop/19BCE1027 PCD
12/10/2021 23:54.27 mpirun -np 3 lab71.exe
0th row satisfies circuit
3th row satisfies circuit
6th row does not satisfies circuit
9th row satisfies circuit
12th row satisfies circuit
15th row satisfies circuit
18th row satisfies circuit
21th row satisfies circuit
24th row does not satisfies circuit1th row satisfies circuit
4th row does not satisfies circuit
7th row does not satisfies circuit
10th row satisfies circuit
13th row satisfies circuit
16th row does not satisfies circuit
19th row does not satisfies circuit
22th row does not satisfies circuit2th row does not satisfies circuit
5th row does not satisfies circuit
8th row does not satisfies circuit
11th row satisfies circuit
14th row does not satisfies circuit
17th row does not satisfies circuit
20th row satisfies circuit
23th row does not satisfi
27th row does not satisfies circuit
30th row satisfies circuit
t
25th row satisfies circuit
28th row does not satisfies circuit
31th row satisfies circuit
es circuit
26th row satisfies circuit
29th row satisfies circuit
```

2. Write a MPI program to display the values of the series $(a_0+b_0)/c_0, (a_1+b_1)/c_1, \dots, (a_n+b_n)/c_n$ where a,b, c and n values are input by the user.

```
#include <stdio.h>

#include <stdlib.h>

#include <time.h>

#include <mpi.h>

#include <math.h>

void check(int,int);

int main ()
```

```

{

    int n=10,i;

    MPI_Init(NULL, NULL);

    int id,p;

    MPI_Comm_rank(MPI_COMM_WORLD,&id);

    MPI_Comm_size(MPI_COMM_WORLD,&p);

    for(i=id;i<n;i+=p){

        check(id,i);

    }

    MPI_Finalize();

}

void check(int id,int i)

{





    int a=1,b=2,c=3;





    float val = (pow(a,i) + pow(b,i)) / pow(c,i);

    printf("for a=%d,b=%d,c=%d,i=%d the value is: %f\n",a,b,c,i,val);

}

```

 /home/mobaxterm/Desktop/19BCE1027 PCD
 12/10/2021  23:46.17  mpicc -o lab72 lab72.c

 /home/mobaxterm/Desktop/19BCE1027 PCD
 12/10/2021  23:46.40  mpirun -np 3 lab72.exe

```
for a=1,b=2,c=3,i=0 the value is: 2.000000  
for a=1,b=2,c=3,i=3 the value is: 0.333333  
for a=1,b=2,c=3,i=6 the value is: 0.089163  
for a=1,b=2,c=3,i=9 the value is: 0.026063  
for a=1,b=2,c=3,i=1 the value is: 1.000000  
for a=1,b=2,c=3,i=4 the value is: 0.209877  
for a=1,b=2,c=3,i=7 the value is: 0.058985  
for a=1,b=2,c=3,i=2 the value is: 0.555556  
for a=1,b=2,c=3,i=5 the value is: 0.135802  
for a=1,b=2,c=3,i=8 the value is: 0.039171
```