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**1RV17CS024**

**PADP**

**LAB PROGRAM: 10**

**Code:**

```
#include <sys/time.h>

#include<stdlib.h>

#include <stdio.h>

#define MAX 1000

int SIZE;

double a[MAX][MAX];

double b[MAX][MAX];

double c[MAX][MAX];

double d[MAX][MAX];

int main(int argc, char* argv[])

{

    SIZE=atoi(argv[1]);

    int i,j,k;

    struct timeval tim;

    double t1, t2;

    double tmp;

    // Initialize matrices.

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

        for (j = 0; j < SIZE; ++j) {

            a[i][j] = (double)(i + j);

            b[i][j] = (double)(i - j);

            c[i][j] = 0.0f;

            d[i][j] = 0.0f;
```

```

}
}
for (i = 0; i < SIZE; ++i) {
    for (j = 0; j < SIZE; ++j) {
        tmp=0.0f;
        // #pragma acc loop reduction(+:tmp)
        for (k = 0; k < SIZE; ++k) {
            tmp += a[i][k] * b[k][j];
        }
        d[i][j] = tmp;
    }
}

// Time stamp t1
gettimeofday(&tim, NULL);
t1=tim.tv_sec+(tim.tv_usec/1000000.0);

// Compute matrix multiplication.
#pragma acc data copyin(a,b) copy(c)
#pragma acc kernels
#pragma acc loop tile(32,32)
for (i = 0; i < SIZE; ++i) {
    for (j = 0; j < SIZE; ++j) {
        tmp=0.0f;
        #pragma acc loop reduction(+:tmp)
        for (k = 0; k < SIZE; ++k) {
            tmp += a[i][k] * b[k][j];
        }
        c[i][j] = tmp;
    }
}

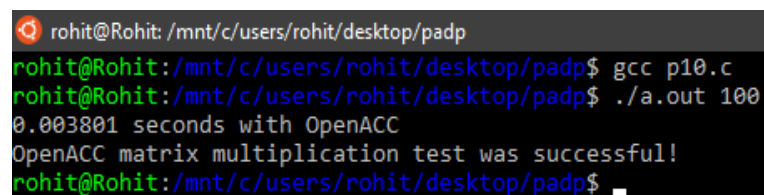
```

```

// Time stamp t2, elapsed time OpenACC
gettimeofday(&tim, NULL);
t2=tim.tv_sec+(tim.tv_usec/1000000.0);
printf("%.6lf seconds with OpenACC \n", t2-t1);
// Check the OpenACC result matrix
for (i = 0; i < SIZE; ++i)
for (j = 0; j < SIZE; ++j)
if(c[i][j] != d[i][j]) {
printf("Error %d %d %f %f \n", i,j, c[i][j], d[i][j]);
exit(1);
}
printf("OpenACC matrix multiplication test was successful!\n");
return 0;
}

```

### OUTPUT:



```

rohit@Rohit: /mnt/c/users/rohit/desktop/padp
rohit@Rohit:/mnt/c/users/rohit/desktop/padp$ gcc p10.c
rohit@Rohit:/mnt/c/users/rohit/desktop/padp$ ./a.out 100
0.003801 seconds with OpenACC
OpenACC matrix multiplication test was successful!
rohit@Rohit:/mnt/c/users/rohit/desktop/padp$ _

```

