Name : Atharva Bilonikar
Uid No: 2021700011
CSE DS D1
DAA Lab Exp 3

Aim: Strassens Matrix Multiplication

Code :
// Code for 2*2 matrices

```c
#include<stdio.h>

int main(){

 int p[2][2], q[2][2], r[2][2], i, j;

 int a1, a2, a3, a4 , a5, a6, a7;


  printf("Enter the 4 elements of first matrix: ");

  for(i = 0;i < 2; i++)

    for(j = 0;j < 2; j++)

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


  printf("Enter the 4 elements of second matrix: ");

  for(i = 0; i < 2; i++)

    for(j = 0;j < 2; j++)

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


  printf("\nThe first matrix is\n");

  for(i = 0; i < 2; i++){

    printf("\n");

    for(j = 0; j < 2; j++)

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

  }
```

```c
printf("\nThe second matrix is\n");

for(i = 0;i < 2; i++){

    printf("\n");

    for(j = 0;j < 2; j++)

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

}


a1= (p[0][0] + p[1][1]) * (q[0][0] + q[1][1]);

a2= (p[1][0] + p[1][1]) * q[0][0];

a3= p[0][0] * (q[0][1] - q[1][1]);

a4= p[1][1] * (q[1][0] - q[0][0]);

a5= (p[0][0] + p[0][1]) * q[1][1];

a6= (p[1][0] - p[0][0]) * (q[0][0]+q[0][1]);

a7= (p[0][1] - p[1][1]) * (q[1][0]+q[1][1]);


r[0][0] = a1 + a4- a5 + a7;

r[0][1] = a3 + a5;

r[1][0] = a2 + a4;

r[1][1] = a1 - a2 + a3 + a6;


 printf("\nAfter multiplication using Strassen's algorithm \n");

 for(i = 0; i < 2 ; i++){

    printf("\n");

    for(j = 0;j < 2; j++)

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

```
    }



    return 0;

}
```

Output:

Conclusion: In this , experiment i understood Divide and Conquer algorithms and how to implement them . I was also able to compare time complexity of Brute force matrix multiplication and Strasen's Matrix Multiplication.