

Q1. Write a java program to add two matrix?

Matrix A

10	20	30
40	50	60
70	80	90

Matrix B

1	2	3
4	5	6
7	8	9

Matrix C

11	22	33
44	55	66
77	88	99

The diagram illustrates the addition of two 3x3 matrices, A and B, to produce matrix C. Matrix A contains the values 1, 2, 3 in each row. Matrix B contains the values 1, 2, 3 in each row. Matrix C contains the results of the addition: 6, 12, 18 in each row. The diagram uses colored boxes to highlight the elements being added and the resulting sum. The formula  $1*1+1*2+1*3$  is shown, representing the calculation for the first row. The loops are labeled 'Loop1 i' and 'Loop j'. The Windows taskbar at the bottom shows the time as 19:47 on 02-12-2024.

```

import java.util.Scanner;
class A3{
    public static void main(String args[]){
        int A[][]=new int[3][3];
        int B[][]=new int[3][3];
        int C[][]=new int[3][3];

        Scanner sk=new Scanner(System.in);
        System.out.println("Matrix A ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.println("Enter Element Index of "+i+j+" : ");
                A[i][j]=sk.nextInt();
            }
        }
        //input Matrix B
        System.out.println("\nMatrix B ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.println("Enter Element Index of "+i+j+" : ");
                B[i][j]=sk.nextInt();
            }
        }

        //input Matrix B
        //Addition Logic
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                for(int k=0;k<3;k++){
                    C[i][j]+=A[i][k]*B[k][j];
                }
            }
        }

        System.out.println("\nOutput Matrix A : ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print("\t"+A[i][j]);
            }
            System.out.println("");
        }
        //print Matrix A

        System.out.println("\nOutput Matrix B : ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print("\t"+B[i][j]);
            }
            System.out.println("");
        }
        //print Matrix B

        System.out.println("\nOutput Matrix C Addition : ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.print("\t"+C[i][j]);
            }
            System.out.println("");
        }
        //print Matrix C

    }
}

```

}

Matrix A (Loop i):

	C1	C2	C3
R1	1	1	1
R2	2	2	2
R3	3	3	3

Matrix B (Loop j):

	C1	C2	C3
R1	1	1	1
R2	2	2	2
R3	3	3	3

Matrix C (k):

	C1	C2	C3
R1	6	12	18
R2	12	24	36
R3	18	36	54

Calculations for Matrix C (Row 1):

$$1*1+1*2+1*3 = 6$$

$$2*1+2*2+2*3 = 12$$

$$3*1+3*2+3*3 = 18$$

Formula:  $C[i][j] = A[i][k] * B[k][j];$

```
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        int C[][]=new int[3][3];

        Scanner sk=new Scanner(System.in);
        System.out.println("Matrix A ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.println("Enter Element Index of "+i+j+" : ");
                A[i][j]=sk.nextInt();
            }
        }
        //input Matrix B
        System.out.println("\nMatrix B ");
        for(int i=0;i<3;i++){
            for(int j=0;j<3;j++){
                System.out.println("Enter Element Index of "+i+j+" : ");
                B[i][j]=sk.nextInt();
            }
        }

        //input Matrix B
```

```
//Addition Logic
for(int i=0;i<3;i++){//i=0
    for(int j=0;j<3;j++){//j=1
        for(int k=0;k<3;k++){//k=0
            C[i][j]=C[i][j]+A[i][k]*B[k][j];
        }
    }
}

System.out.println("\nOutput Matrix A : ");
for(int i=0;i<3;i++){//i=0
    for(int j=0;j<3;j++){//j=0
        System.out.print("\t"+A[i][j]);
    }
    System.out.println("");
}

System.out.println("\nOutput Matrix B : ");
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){
        System.out.print("\t"+B[i][j]);
    }
    System.out.println("");
}

System.out.println("\nOutput Matrix C Addition : ");
for(int i=0;i<3;i++){
    for(int j=0;j<3;j++){
        System.out.print("\t"+C[i][j]);
    }
    System.out.println("");
}

}
```

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