CODE:

```
#include <stdio.h>
#include <stdlib.h>

void display(int a[100][100], int r, int c)                    //to display resultant array
{
   printf("\nResultant array is:\n");
   for (int i=0; i<r; i++)
   {
      for (int j=0; j<c; j++)
      {
         printf("%d", a[i][j]);
         printf("  ");
      }
      printf("\n");
   }
}

void add (int a[100][100],int r1, int c1, int b[100][100], int r2, int c2)         //addition function
{
   int c[100][100];
   if (r1==r2 && c1==c2)                                          //checking for condition
   {
      for (int i=0; i<r1; i++)
      {
         for (int j=0; j<c1; j++)
         {
            c[i][j]=a[i][j]+b[i][j];
         }
      }
      display (c, r1, c2);
   }
   else
```

```
    {
        printf("\nThe matrices cannot be added!");
    }
}

void subtract (int a[100][100],int r1, int c1, int b[100][100], int r2, int c2)          //subtraction function
{
    int c[100][100];                                                    //checking for condition
    if (r1==r2 && c1==c2)
    {
        for (int i=0; i<r1; i++)
        {
            for (int j=0; j<c1; j++)
            {
                c[i][j]=a[i][j]-b[i][j];
            }
        }
        display (c, r1, c2);
    }
    else
    {
        printf("\nThe matrices cannot be subtracted!");
    }
}

void multiply (int a[100][100],int r1, int c1, int b[100][100], int r2, int c2)          //multiplication function
{
    int c[100][100];
    if (c1==r2)                                                         //checking for condition
    {
        for (int i=0; i<r1; i++)
        {
            for (int j=0; j<c2; j++)
            {
```

```
            c[i][j]=0;
            for (int k=0; k<r2; k++)
               c[i][j]+=a[i][k]*b[k][j];
         }
      }
      display (c, r1, c2);
   }
   else
   {
      printf("The matrices cannot be multiplied! ");
   }
}

int main()
{
   while (1)
   {
      int r1,c1,r2,c2, a[100][100], b[100][100];
      printf("\nEnter the no. of rows and columns for matrix 1: ");
      scanf("%d%d", &r1, &c1);
      printf("Enter the no. of rows and columns for matrix 2: ");
      scanf("%d%d", &r2, &c2);
      printf("Enter the matrix 1(row wise):\n");
      for (int i=0; i<r1; i++)
      {
         for (int j=0; j<c1; j++)
         {
            scanf("%d", &a[i][j]);
         }
      }
      printf("Enter the matrix 2(row wise):\n");
      for (int i=0; i<r2; i++)
      {
         for (int j=0; j<c2; j++)
```

```
    {
        scanf("%d", &b[i][j]);
    }
  }

  A:
  printf("\nMENU: \n1. Addition of two given matrices. \n2. Subtraction of two given matrices. \n3. Multiplication of two given matrices. \n4. Exit.");
  printf("\nEnter your choice: ");
  int ch;
  scanf("%d", &ch);
  switch (ch)
  {
    case 1: printf("Matrix 1: \n");
        for (int i=0; i<r1; i++)
        {
          for (int j=0; j<c1; j++)
          {
            printf("%d", a[i][j]);
            printf("  ");
          }
          printf("\n");
        }
        printf("\nMatrix 2: \n");
        for (int i=0; i<r2; i++)
        {
          for (int j=0; j<c2; j++)
          {
            printf("%d", b[i][j]);
            printf("  ");
          }
          printf("\n");
        }
        add (a, r1, c1, b, r2, c2);
```

```
        break;
case 2: printf("Matrix 1: \n");
        for (int i=0; i<r1; i++)
        {
           for (int j=0; j<c1; j++)
           {
              printf("%d", a[i][j]);
              printf("  ");
           }
           printf("\n");
        }
        printf("\nMatrix 2: \n");
        for (int i=0; i<r2; i++)
        {
           for (int j=0; j<c2; j++)
           {
              printf("%d", b[i][j]);
              printf("  ");
           }
           printf("\n");
        }
        subtract (a, r1, c1, b, r2, c2);
        break;
case 3: printf("Matrix 1: \n");
        for (int i=0; i<r1; i++)
        {
           for (int j=0; j<c1; j++)
           {
              printf("%d", a[i][j]);
              printf("  ");
           }
           printf("\n");
        }
        printf("\nMatrix 2: \n");
```

```
            for (int i=0; i<r2; i++)
            {
               for (int j=0; j<c2; j++)
               {
                  printf("%d", b[i][j]);
                  printf("  ");
               }
               printf("\n");
            }
            multiply (a, r1, c1, b, r2, c2);
            break;
         case 4: exit(0);
         default: printf("Wrong choice entered! Try again! ");
                  goto A;
       }
    }
    return 0;
}
```

OUTPUT:

```
Enter the matrix 1(row wise):
1
2
3
4
Enter the matrix 2(row wise):
5
6
7
8

MENU:
1. Addition of two given matrices.
2. Subtraction of two given matrices.
3. Multiplication of two given matrices.
4. Exit.
Enter your choice: 1
Matrix 1:
1  2
3  4

Matrix 2:
5  6
7  8

Resultant array is:
6  8
10  12
```

```
Enter the no. of rows and columns for matrix 1: 3
3
Enter the no. of rows and columns for matrix 2: 3
3
Enter the matrix 1(row wise):
1
1
1
1
1
1
1
1
1
Enter the matrix 2(row wise):
1
1
1
1
1
1
1
1
1

MENU:
1. Addition of two given matrices.
2. Subtraction of two given matrices.
3. Multiplication of two given matrices.
4. Exit.
Enter your choice: 2
Matrix 1:
1  1  1
1  1  1
1  1  1

Matrix 2:
1  1  1
1  1  1
1  1  1
```

```
Resultant array is:
0  0  0
0  0  0
0  0  0
```

```
Enter the no. of rows and columns for matrix 1: 3
2
Enter the no. of rows and columns for matrix 2: 2
3
Enter the matrix 1(row wise):
1
1
2
2
3
3
Enter the matrix 2(row wise):
1
1
1
2
2
2

MENU:
1. Addition of two given matrices.
2. Subtraction of two given matrices.
3. Multiplication of two given matrices.
4. Exit.
Enter your choice: 3
Matrix 1:
1  1
2  2
3  3

Matrix 2:
1  1  1
2  2  2

Resultant array is:
3  3  3
6  6  6
9  9  9
```