1. **WAP to accept and display an m*n matrix in proper format**
2. **Write a program in C to read m*n matrix and find sum and average of elements in the matrix.**
3. **Write a program in C to read m x n matrix and find largest element from matrix.**
4. **Write a program in C to read square matrix of order n and find sum of principal diagonal elements.**
5. **Write a program in C to multiply two 3x3 matrix.**
6. **Write a program in C to find determinant of 2 x 2 matrix.**

# WAP to accept and display an m*n matrix in proper format

```
#include<stdio.h>

int main()
{
 int i,j,m,n;
 float a[10][10];

 printf("Enter row and column size:\n");
 scanf("%d%d", &m, &n);

 printf("Enter matrix elements:\n");
 for(i=0;i< m;i++)
 {
  for(j=0;j< n;j++)
  {
   printf("a[%d][%d]=",i,j);
   scanf("%f", &a[i][j]);
  }
 }

 printf("Matrix read is:\n");
 for(i=0;i< m;i++)
 {
  for(j=0;j< n;j++)
  {
   printf("%f\t",a[i][j]);
  }
  printf("\n");
 }

}
```

**OUTPUT:**

```
Enter row and column size:
2
3
Enter matrix elements:
a[0][0]=2
a[0][1]=4
a[0][2]=5
a[1][0]=8
a[1][1]=6
a[1][2]=33
Matrix read is:
2.000000        4.000000        5.000000
8.000000        6.000000        33.000000
```

# Write a program in C to read m*n matrix and find sum and average of elements in the matrix.

```
#include<stdio.h>


int main()
{
 int i,j,m,n;
 float a[10][10], sum=0.0, avg;

 printf("Enter row and column size:\n");
 scanf("%d%d", &m, &n);
 printf("Enter matrix elements:\n");
 for(i=0;i< m;i++)
 {
  for(j=0;j< n;j++)
  {
   printf("a[%d][%d]=",i,j);
   scanf("%f", &a[i][j]);
  }
 }

 for(i=0;i< m;i++)
 {
  for(j=0;j< n;j++)
  {
   sum = sum + a[i][j];
  }
 }

 avg = sum/(m*n);
 printf("Sum = %f\n", sum);
 printf("Average = %f", avg);

}
```

**OUTPUT:**

```
Enter row and column size:
2
3
Enter matrix elements:
a[0][0]=1
a[0][1]=2
a[0][2]=3
a[1][0]=4
a[1][1]=5
a[1][2]=6
Sum = 21.000000
Average = 3.500000
```

# Write a program in C to read m x n matrix and find largest element from matrix.

```
#include<stdio.h>

int main()
{
 int i,j,m,n;
 float a[10][10], lg;

 printf("Enter row and column size:\n");
 scanf("%d%d", &m, &n);
 printf("Enter matrix elements:\n");
 for(i=0;i< m;i++)
 {
  for(j=0;j< n;j++)
  {
   printf("a[%d][%d]=",i,j);
   scanf("%f", &a[i][j]);
  }
 }
 lg = a[0][0];
 for(i=0;i< m;i++)
 {
  for(j=0;j< n;j++)
  {
   if(a[i][j]>lg)
   {
    lg = a[i][j];
   }
  }
 }
 printf("Largest = %f\n", lg);

}
```

**OUTPUT:**

```
Enter row and column size:
2
3
Enter matrix elements:
a[0][0]=1
a[0][1]=2
a[0][2]=3
a[1][0]=4
a[1][1]=5
a[1][2]=6
Largest = 6.000000
```

# Write a program in C to read square matrix of order n and find sum of principal diagonal elements.

```
#include<stdio.h>

int main()
{
 int i,j,n;
 float a[10][10], sum=0.0;
 printf("Enter order of matrix:\n");
 scanf("%d", &n);

 printf("Enter matrix elements:\n");
 for(i=0;i< n;i++)
 {
  for(j=0;j< n;j++)
  {
   printf("a[%d][%d]=",i,j);
   scanf("%f", &a[i][j]);
  }
 }

 for(i=0;i< n;i++)
 {
  for(j=0;j< n;j++)
  {
   if(i==j)
   {
    sum = sum + a[i][j];
   }
  }
 }
 printf("Sum = %f\n", sum);

 return 0;
}
```

**OUTPUT:**

```
Enter order of matrix:
3
Enter matrix elements:
a[0][0]=1
a[0][1]=2
a[0][2]=3
a[1][0]=4
a[1][1]=5
a[1][2]=6
a[2][0]=7
a[2][1]=8
a[2][2]=9
Sum = 15.000000
```

# Write a program in C to multiply two 3x3 matrix.

```
#include<stdio.h>


int main()
{
 int i,j,k;
 float a[3][3], b[3][3], mul[3][3];

 printf("Enter elements of first matrix:\n");
 for(i=0;i< 3;i++)
 {
  for(j=0;j< 3;j++)
  {
   printf("a[%d][%d]=",i,j);
   scanf("%f", &a[i][j]);
  }
 }

 printf("Enter elements of second matrix:\n");
 for(i=0;i< 3;i++)
 {
  for(j=0;j< 3;j++)
  {
   printf("b[%d][%d]=",i,j);
   scanf("%f", &b[i][j]);
  }
 }

 for(i=0;i< 3;i++)
 {
  for(j=0;j< 3;j++)
  {
   mul[i][j] = 0;
   for(k=0;k< 3;k++)
   {
    mul[i][j] = mul[i][j] + a[i][k]*b[j][k];
   }
  }
 }

 printf("Multiplied matrix is:\n");
 for(i=0;i< 3;i++)
 {
  for(j=0;j< 3;j++)
  {
   printf("%f\t", mul[i][j]);
  }
  printf("\n");
 }
```

```
 return 0;
}
```

**OUTPUT:**

```
Enter elements of first matrix:
a[0][0]=1
a[0][1]=2
a[0][2]=3
a[1][0]=4
a[1][1]=5
a[1][2]=6
a[2][0]=7
a[2][1]=8
a[2][2]=9
Enter elements of second matrix:
b[0][0]=9
b[0][1]=8
b[0][2]=7
b[1][0]=6
b[1][1]=5
b[1][2]=4
b[2][0]=3
b[2][1]=2
b[2][2]=1
Multiplied matrix is:
46.000000       28.000000       10.000000
118.000000      73.000000       28.000000
190.000000      118.000000      46.000000
```

# Write a program in C to find determinant of 2 x 2 matrix.

```
#include<stdio.h>

int main()
{
 float a[2][2], det;
 int i,j;


 /* Input Part */
 printf("Enter 2 x 2 matrix:\n");
 for(i=0;i< 2;i++)
 {
  for(j=0;j< 2;j++)
  {
   printf("a[%d][%d]=",i,j);
   scanf("%f",&a[i][j]);
  }
 }

 det = a[0][0]*a[1][1] - a[1][0]*a[0][1];

 /* Displaying Output */
 printf("Determinant is %f",det);

}
```

**OUTPUT:**

```
Enter 2 x 2 matrix:
a[0][0]=1
a[0][1]=2
a[1][0]=3
a[1][1]=4
Determinant is -2.000000
```