1) WRITE A PROGRAM TO PRINT SUM OF MATRIX IN MANUAL WAY

```
#include <stdio.h>
int main() {
  int r, c,a[2][2]={{1,2},{1,2}}, b[2][2]={{2,1},{2,1}}, sum[100][100],
i, j;
  //FIRST MATRIX
  printf("print first matrix:\n");
  for(i =0; i<2 ;i++){
        for(j=0; j<2 ; j++){
            printf("%d   ", a[i][j]);
        }
        printf("\n");
    }

   //SECOND MATRIX
   printf("print the second matrix:\n");
    for(i =0;i<2;i++){
        for(j=0;j<2; j++){
            printf("%d ",b[i][j]);
        }
        printf("\n");
    }

  // adding two matrices
  for (i = 0; i < 2; ++i)
    for (j = 0; j < 2; ++j) {
      sum[i][j] = a[i][j] + b[i][j];
    }

  // printing the result
  printf("\nSum of two matrices: \n");
  for (i = 0; i < 2; ++i){
    for (j = 0; j < 2; ++j) {
      printf("%d   ", sum[i][j]);
      }
     printf("\n");
}
  return 0;
}
```

2) To get rows and columns from user and write sum of matrix program:

```
#include <stdio.h>
int main() {
  int r, c, a[100][100], b[100][100], sum[100][100], i, j;
  printf("Enter the number of rows (between 1 and 100): ");
  scanf("%d", &r);
  printf("Enter the number of columns (between 1 and 100): ");
  scanf("%d", &c);
```

```
  printf("\nEnter elements of 1st matrix:\n");
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      printf("Enter element a%d%d: ", i + 1, j + 1);
      scanf("%d", &a[i][j]);
    }

    printf("print first matrix:\n");
    for(i =0; i<r ;i++){
        for(j=0; j<c ; j++){
            printf("%d  ", a[i][j]);
        }
        printf("\n");
    }

  printf("Enter elements of 2nd matrix:\n");
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      printf("Enter element b%d%d: ", i + 1, j + 1);
      scanf("%d", &b[i][j]);
    }

    printf("print the second matrix:\n");
    for(i =0;i<r;i++){
        for(j=0;j<c; j++){
            printf("%d  ",b[i][j]);
        }
        printf("\n");
    }
  // adding two matrices
  for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
      sum[i][j] = a[i][j] + b[i][j];
    }

  // printing the result
  printf("\nSum of two matrices: \n");
  for (i = 0; i < r; ++i){
    for (j = 0; j < c; ++j) {
      printf("%d  ", sum[i][j]);

    }
    printf("\n");
  }


  return 0;
}
```

3) TRANSPOSE MATRIX

```c
#include <stdio.h>

int main()
{
    int rows,column;
    int arr[100][100],result[100][100];
    printf("enter the rows and column:");
    scanf("%d %d",&rows,&column);

    printf("enter matrix elements:\n");
    for(int i=0;i<rows;i++){
        for(int j=0;j<column;j++){
            printf("enter element a%d%d:",i,j);
            scanf("%d",&arr[i][j]);
        }
    }

    printf("print matrix elements:\n");
    for(int i=0;i<rows;i++){
        for(int j=0;j<column;j++){
            printf("%d ",arr[i][j]);
        }
        printf("\n");
    }


    for(int i=0;i<rows;i++){
        for(int j=0;j<column;j++){
            result[j][i]=arr[i][j];
        }
    }

    printf("Transpose Matrix:\n");
    for(int i=0;i<column;i++){
        for(int j=0;j<rows;j++){
            printf("%d ",result[i][j]);
        }
        printf("\n");
    }
    return 0;
}
```

4) WRITE A C PROGRAM TO FIND MATRIX MULTIPLICATION....

```c
#include <stdio.h>

int main() {
   int first[10][10], second[10][10], result[10][10], r1, c1, r2, c2;
```

```
printf("Enter rows and column for the first matrix: ");
scanf("%d %d", &r1, &c1);
printf("Enter rows and column for the second matrix: ");
scanf("%d %d", &r2, &c2);

// Taking input until
// 1st matrix columns is not equal to 2nd matrix row
while (c1 != r2) {
   printf("Error! Enter rows and columns again.\n");
   printf("Enter rows and columns for the first matrix: ");
   scanf("%d%d", &r1, &c1);
   printf("Enter rows and columns for the second matrix: ");
   scanf("%d%d", &r2, &c2);
}

 printf("\nEnter first matrix elements: \n");

 for (int i = 0; i < r1; ++i) {
   for (int j = 0; j < c1; ++j) {
      printf("Enter a%d%d: ", i + 1, j + 1);
      scanf("%d", &first[i][j]);
   }
}

printf("\nEnter second matrix elements: \n");

for (int i = 0; i < r2; ++i) {
   for (int j = 0; j < c2; ++j) {
      printf("Enter a%d%d: ", i + 1, j + 1);
      scanf("%d", &second[i][j]);
   }
}

// Initializing elements of matrix mult to 0.
for (int i = 0; i < r1; ++i) {
   for (int j = 0; j < c2; ++j) {
      result[i][j] = 0;
   }
}

// Multiplying first and second matrices and storing it in result
for (int i = 0; i < r1; ++i) {
   for (int j = 0; j < c2; ++j) {
      for (int k = 0; k < c1; ++k) {
         result[i][j] += first[i][k] * second[k][j];
      }
   }
}

  printf("\nOutput Matrix:\n");
  for (int i = 0; i < r1; ++i) {
   for (int j = 0; j < c2; ++j) {
      printf("%d  ", result[i][j]);
```

```
      }
      printf("\n");
     }

   return 0;
}
```

5) IDENTITY MATRIX:

```
// C program to print Identity Matrix
#include<stdio.h>

int Identity(int num)
{
      int row, col;

      for (row = 0; row < num; row++)
      {
            for (col = 0; col < num; col++)
            {
                  // Checking if row is equal to column
                  if (row == col)
                        printf("%d ", 1);
                  else
                        printf("%d ", 0);
            }
            printf("\n");
      }
      return 0;
}

// Driver Code
int main()
{
      int size = 5;
      identity(size);
      return 0;
}
```