

**Chandrajit Mohan**

**C Programs to Practice**

**Abstract**

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**Chandrajit Mohan**

## **C Programs to Practice**

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# C Programs to Practice

[ DR. CHANDRAJIT MOHAN ]

## Table of Contents

<b>Part A</b>		
<b>Sl. No.</b>	<b>Program Name</b>	<b>Page No.</b>
1.	Program to find areas of Circle, Triangle and Rectangle	3
2.	Simple Calculator using Switch case	5
3.	Largest of 3 numbers using nested if-else	7
4.	Sum of even and odd in a given range	8
5.	Compute roots of quadratic equation	9
6.	Generate prime numbers from m to n	11
7.	Linear Search	13
8.	Find Largest and Smallest Element in Array	15
9.	Compute sum of digits and check if input number is palindrome or not	17
10.	Ascending order using Bubble Sort	19
11.	nPr and nCr using Recursion	22
12.	find the sum of first N natural numbers using recursive function	24
13.	Find the LCM and GCD using recursive function	25
14.	Illustrate Sting Handling Functions	27
<b>Part B</b>		
15.	Add two matrices	29
16.	Multiply two matrices	32
17.	Transpose of a matrix	36
18.	Compute Trace and Norm of a matrix using Functions	39
19.	Sort array of strings	41
20.	To convert all upper case to lower case and lower case to upper case in a string	44
21.	To swap two number using call by reference and call by value	46
22.	To Illustrate difference between Structure and Union	50

<b>23.</b>	<b>To Illustrate Array of Structure</b>	<b>52</b>
<b>24.</b>	<b>Compute Sum of n numbers in an array using pointers</b>	<b>54</b>
<b>25.</b>	<b>Concatenate two strings using pointers and user defined functions</b>	<b>56</b>
<b>26.</b>	<b>To create a simple marks card using files</b>	<b>58</b>



### //1. Program to find areas of Circle, Triangle and Rectangle

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

int main()
{
    float base, length, breadth, height, areaRect, areaCir, areaTri, radius;
    printf("-----\n");
    printf("Enter the radius\n");
    scanf("%f", &radius);
    areaCir = 3.142 * radius * radius;
    printf("Area of a circle = %.2f\n", areaCir);
    printf("-----\n");
    printf("Enter the breadth and length\n");
    scanf("%f %f", &breadth, &length);
    areaRect = breadth * length;
    printf("Area of a Rectangle = %.2f\n", areaRect);
    printf("-----\n");
    printf("Enter the base and height\n");
    scanf("%f %f", &base, &height);
    areaTri = 0.5 * base * height;
    printf("Area of a Triangle = %f\n", areaTri);
    printf("-----\n");
    return 0;
}
```

**Output:**

-----

Enter the radius

5

Area of a circle = 78.55

-----

Enter the breadth and length

5

4

Area of a Rectangle = 20.00

-----

Enter the base and height

5

6

Area of a Triangle = 15.000000

---

## //2. Simple Calculator using Switch case

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

int main()
{
    char operator;
    float first, second;
    printf("Enter an operator (+, -, *, /): ");
    scanf("%c", &operator);
    printf("Enter two operands: ");
    scanf("%f %f", &first, &second);

    switch (operator) {
    case '+':
        printf("%.2f + %.2f = %.2f", first, second, first + second);
        break;
    case '-':
        printf("%.2f - %.2f = %.2f", first, second, first - second);
        break;
    case '*':
        printf("%.2f x %.2f = %.2f", first, second, first * second);
        break;
    case '/':
        printf("%.2f / %.2f = %.2f", first, second, first / second);
        break;
        // operator doesn't match any case constant
    default:
        printf("Error! operator is not correct");
    }
```

```
}  
return 0;  
}
```

**Output:**

Enter an operator (+, -, \*, /):

\*

Enter two operands:

5

5

5.00 x 5.00 = 25.00

### //3. Largest of 3 numbers using nested if-else

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int n1, n2, n3;
    printf("Enter three numbers: ");
    scanf("%d %d %d", &n1, &n2, &n3);

    if (n1 >= n2) {
        if (n1 >= n3)
            printf("%d is the largest number.", n1);
        else
            printf("%d is the largest number.", n3);
    } else {
        if (n2 >= n3)
            printf("%d is the largest number.", n2);
        else
            printf("%d is the largest number.", n3);
    }
    return 0;
}
```

#### **Output:**

Enter three numbers:

15

100

2

100 is the largest number.

#### **//4. Sum of even and odd in a given range**

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

int main()
{
    int i, num, odd_sum = 0, even_sum = 0;

    printf("Enter the value of num\n");
    scanf("%d", &num);
    for (i = 1; i <= num; i++)
    {
        if (i % 2 == 0)
            even_sum = even_sum + i;
        else
            odd_sum = odd_sum + i;
    }
    printf("Sum of all odd numbers = %d\n", odd_sum);
    printf("Sum of all even numbers = %d\n", even_sum);
    return 0;
}
```

#### **Output:**

Enter the value of num

10

Sum of all odd numbers = 25

Sum of all even numbers = 30

### //5. Compute roots of quadratic equation

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    float a, b, c, discriminant, root1, root2, realPart, imagPart;
    printf("Enter coefficients a, b and c: ");
    scanf("%f %f %f", &a, &b, &c);
    discriminant = b * b - 4 * a * c;

    // condition for real and different roots
    if (discriminant > 0) {
        printf("Roots are real and different\n");
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("root1 = %.2f and root2 = %.2f", root1, root2);
    }

    // condition for real and equal roots
    else if (discriminant == 0) {
        printf("Roots are Real and Equal\n");
        root1 = root2 = -b / (2 * a);
        printf("root1 = root2 = %.2f;", root1);
    }

    // if roots are not real
    else {
        printf("Roots are imaginary\n");
        realPart = -b / (2 * a);
```

```

    imagPart = sqrt(-discriminant) / (2 * a);
    printf("root1 = %.2f+%.2fi and root2 = %.2f-%.2fi", realPart, imagPart, realPart, imagPart);
}
return 0;
}

```

**Output:**

Enter coefficients a, b and c:

3

4

5

Roots are imaginary

root1 = -0.67+1.11i and root2 = -0.67-1.11i

**Output:**

Enter coefficients a, b and c:

3

1

-2

Roots are real and different

root1 = 0.67 and root2 = -1.00

**Output:**

Enter coefficients a, b and c:

1

-18

81

Roots are Real and Equal

**root1 = root2 = 9.00;**



### //6. Generate prime numbers from m to n

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

int main()
{
    int i,j,n,m;

    printf("Enter the number starting number\n");
    scanf("%d",&m);
    printf("Enter the number ending number\n");
    scanf("%d",&n);
    printf("Prime numbers between %d and %d are:-\n", m, n);
    for(i=m;i<=n;i++)
    {
        int c=0;
        for(j=1;j<=i;j++)
        {
            if(i%j==0)
            {
                c++;
            }
        }

        if(c==2)
        {
            printf("%d ",i);
        }
    }
}
```

```
    return 0;  
}
```

**Output:**

Enter the number starting number

1

Enter the number ending number

100

Prime numbers between 1 and 100 are:-

2 3 5 7 11 13 17 19 23 29 31 37 41 43 47 53 59 61 67 71 73 79 83 89 97

## // 7. Linear Search

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int array[100], ele, c, n, found=0;
    printf("Enter number of elements in array\n");
    scanf("%d", &n);
    printf("Enter %d integer(s)\n", n);
    for (c = 0; c < n; c++)
        scanf("%d", &array[c]);
    printf("Enter a number to search\n");
    scanf("%d", &ele);
    for (c = 0; c < n; c++)
    {
        if (array[c] == ele) /* If required element is found */
        {
            found=1;
            break;
        }
    }
    if (found == 1)
        printf("%d is present at location %d.\n", ele, c+1);
    else
        printf("%d NOT present in the array.\n", ele);
    return 0;
}
```

**Output: Case 1**

Enter number of elements in array

3

Enter 3 integer(s)

1

2

3

Enter a number to search

3

3 is present at location 3.

**Output: Case 2**

Enter number of elements in array

3

Enter 3 integer(s)

1

4

5

Enter a number to search

9

9 NOT present in the array.

## // 8. Find Largest and Smallest Element in Array

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

int main()
{
    int a[50], size, i, big, small;

    printf("\nEnter the size of the array: ");
    scanf("%d", &size);

    printf("\nEnter the %d elements of the array: \n\n", size);
    for(i = 0; i < size; i++)
        scanf("%d", &a[i]);

    big = a[0]; // initializing
    /*
        from 2nd element to the last element
        find the bigger element than big and
        update the value of big
    */
    for(i = 1; i < size; i++)
    {
        if(big < a[i]) // if larger value is encountered
        {
            big = a[i]; // update the value of big
        }
    }
    printf("\n\nThe largest element is: %d", big);
```

```

small = a[0]; // initializing
/*
    from 2nd element to the last element
    find the smaller element than small and
    update the value of small
*/
for(i = 1; i < size; i++)
{
    if(small>a[i]) // if smaller value is encountered
    {
        small = a[i]; // update the value of small
    }
}
printf("\n\nThe smallest element is: %d", small);
return 0;
}

```

**Output:**

Enter the size of the array:

5

Enter the 5 elements of the array:

1

-99

0

100

250

The largest element is: 250

The smallest element is: -99

**// 9. Compute sum of digits and check if input number is palindrome or not**

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

int main()
{
    int n,lastDigit,sum=0,rev=0, temp;
    printf("enter the number=");
    scanf("%d",&n);
    temp=n;
    while(n!=0)
    {
        lastDigit=n%10;
        rev=(rev*10)+lastDigit;
        sum=sum+lastDigit;
        n=n/10;
    }
    if(temp==rev)
        printf("Palindrome number\n");
    else
        printf("Not a palindrome\n");
    printf("Sum of digits=%d", sum);
    return 0;
}
```

**Output: Case 1**

enter the number=121

Palindrome number

Sum of digits=4

**Output: Case 2**

enter the number=123

Not a palindrome

Sum of digits=6



## // 10. Ascending order using Bubble Sort

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

int main()
{
    int array[100];
    int i, j, num, temp;

    printf("Enter the value of num \n");
    scanf("%d", &num);
    printf("Enter %d elements one by one \n", num);
    for (i = 0; i < num; i++)
    {
        scanf("%d", &array[i]);
    }
    printf("Input array is \n");
    for (i = 0; i < num; i++)
    {
        printf("%d\n", array[i]);
    }
    /* Bubble sorting begins */
    for (i = 0; i < num; i++)
    {
        for (j = 0; j < (num - i - 1); j++)
        {
            if (array[j] > array[j + 1])
            {
                temp = array[j];
```

```
        array[j] = array[j + 1];
        array[j + 1] = temp;
    }
}
}
printf("Sorted array is...\n");
for (i = 0; i < num; i++)
{
    printf("%d\n", array[i]);
}
return 0;
}
```

**Output:**

**Enter the value of num**

5

**Enter 5 elements one by one**

250

76

2

45

128

**Input array is**

250

76

2

45

128

**Sorted array is...**

2

45

76

128

250

## // 11. NpR and NcR using Recursion

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

int factorial(int);
int find_ncr(int, int);
int find_npr(int, int);
int main()
{
    int n, r;
    int ncr, npr;

    printf("Enter the value of n and r\n");
    scanf("%d%d",&n,&r);

    ncr = find_ncr(n, r);
    npr = find_npr(n, r);

    printf("%dC%d = %d\n", n, r, ncr);
    printf("%dP%d = %d\n", n, r, npr);

    return 0;
}
int find_ncr(int n, int r) {
    int result;

    result = factorial(n)/(factorial(r)*factorial(n-r));

    return result;
}
```

```
}  
int find_npr(int n, int r) {  
    int result;  
  
    result = factorial(n)/factorial(n-r);  
  
    return result;  
}  
int factorial(int n) {  
  
    if (n==0)  
        return 1;  
    else  
        return n*factorial(n-1);  
}
```

**Output:**

Enter the value of n and r

5

2

$5C2 = 10$

$5P2 = 20$

**//12. find the sum of first N natural numbers using recursive function**

```
#include <stdio.h>
#include <stdlib.h>
int addNumbers(int n);
int main()
{
    int num;
    printf("Enter a positive integer: ");
    scanf("%d", &num);
    printf("Sum = %d", addNumbers(num));
    return 0;
}
```

```
int addNumbers(int n) {
    if (n != 0)
        return n + addNumbers(n - 1);
    else
        return n;
}
```

**Output:**

Enter a positive integer: 10

Sum = 55

**//13. Find the LCM and GCD using recursive function**

```
#include <stdio.h>
int gcd(int x, int y); //function prototype
int main()
{
    int num1, num2, hcf, lcm;

    printf("Enter two integer Values:\n");
    scanf("%d %d", &num1, &num2);

    hcf = gcd(num1, num2);
    printf("GCD: %d", hcf);
    lcm=(num1 * num2) / hcf;
    printf("\nLCM: %d", lcm);
    return 0;
}
//recursive function
int gcd(int x, int y)
{
    if (y == 0) //recursion termination condition
    {
        return x;
    }
    else
    {
        return gcd(y, x % y); //calls itself
    }
}
```

**Output:**

Enter two integer Values:

40

64

GCD: 8

LCM: 320



#### **//14. Illustrate Sting Handling Functions**

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int main()
{
    char s1[20] = "MITFGC";
    char s2[20] = "MITFGC";
    char s3[20] = "Mysore";
    char s4[20];
    //strlen()
    printf("Length of string str1: %d\n", strlen(s1));
    //strcmp()
    if (strcmp(s1, s2) == 0)
    {
        printf("string 1 and string 2 are equal\n");
    }else
    {
        printf("string 1 and 2 are different\n");
    }
    //strcat()
    strcat(s1,s3);
    printf("Output string after concatenation: %s\n", s1);
    //strcpy()
    strcpy(s4,s2);
    printf("String s4 is: %s", s4);

    return 0;
}
```

**Output:**

Length of string str1: 6

string 1 and string 2 are equal

Output string after concatenation: MITFGCMysore

String s4 is: MITFGC

### //15. Add two matrices

```
#include <stdio.h>
#include <stdlib.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("Enter elements of 2nd 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", &b[i][j]);
        }

    // 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]);
        if (j == c - 1)
        {
            printf("\n\n");
        }
    }

return 0;
}

```

**Output:**

```

Enter the number of rows (between 1 and 100): 2
Enter the number of columns (between 1 and 100): 2

Enter elements of 1st matrix:
Enter element a11: 1
Enter element a12: 1
Enter element a21: 1
Enter element a22: 1

```

Enter elements of 2nd matrix:

Enter element a11: 2

Enter element a12: 2

Enter element a21: 2

Enter element a22: 2

Sum of two matrices:

3 3

3 3

### //16. Multiply two matrices

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

int main()
{
    int a[10][10],b[10][10],mul[10][10],r,c,i,j,k,m,n;
    printf("Enter Dimensions of First Matrix\n");
    printf("enter the number of rows=");
    scanf("%d",&r);
    printf("enter the number of columns=");
    scanf("%d",&c);
    printf("Enter Dimensions of Second Matrix\n");
    printf("enter the number of rows=");
    scanf("%d",&m);
    printf("enter the number of columns=");
    scanf("%d",&n);
    if(c!=m)
    {
        printf("Multiplication Not Possible");
        exit(0);
    }
    printf("enter the first matrix element=\n");
    for(i=0; i<r; i++)
    {
        for(j=0; j<c; j++)
        {
            scanf("%d",&a[i][j]);
        }
    }
}
```

```

}
printf("enter the second matrix element=\n");
for(i=0; i<m; i++)
{
    for(j=0; j<n; j++)
    {
        scanf("%d",&b[i][j]);
    }
}

printf("multiply of the matrix=\n");
for(i=0; i<r; i++)
{
    for(j=0; j<n; j++)
    {
        mul[i][j]=0;
        for(k=0; k<c; k++)
        {
            mul[i][j]+=a[i][k]*b[k][j];
        }
    }
}
//for printing result
for(i=0; i<r; i++)
{
    for(j=0; j<n; j++)
    {
        printf("%d\t",mul[i][j]);
    }
}

```

```
    printf("\n");  
}  
return 0;  
}
```

**Output: Case 1**

Enter Dimensions of First Matrix

enter the number of rows=2

enter the number of columns=3

Enter Dimensions of Second Matrix

enter the number of rows=3

enter the number of columns=2

enter the first matrix element=

1

2

3

4

5

6

enter the second matrix element=

7

8

9

10

11

12

multiply of the matrix=

58 64

139 154



**Output : Case 2**

Enter Dimensions of First Matrix

enter the number of rows=1

enter the number of columns=1

Enter Dimensions of Second Matrix

enter the number of rows=2

enter the number of columns=2

Multiplication Not Possible

### //17. Transpose of a matrix

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

int main()
{
    int a[10][10], transpose[10][10], r, c, i, j;
    printf("Enter rows and columns: ");
    scanf("%d %d", &r, &c);

    // Assigning elements to the matrix
    printf("\nEnter matrix elements:\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]);
        }

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

    // Finding the transpose of matrix a
```

```

for (i = 0; i < r; ++i)
    for (j = 0; j < c; ++j) {
        transpose[j][i] = a[i][j];
    }

// Displaying the transpose of matrix a
printf("\nTranspose of the matrix:\n");
for (i = 0; i < c; ++i)
{
    for (j = 0; j < r; ++j)
    {
        printf("%d ", transpose[i][j]);
    }
    printf("\n");
}
return 0;
}

```

**Output:**

Enter rows and columns: 2

3

Enter matrix elements:

Enter element a11: 1

Enter element a12: 1

Enter element a13: 1

Enter element a21: 1

Enter element a22: 1

Enter element a23: 1

1 1 1

1 1 1

Transpose of the matrix:

1 1

1 1

1 1

## //18. Compute Trace and Norm of a matrix using Functions

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
void compute(int a[10][10],int n);
int main()
{
    int a[10][10],i,j,n;
    printf("\nEnter order of the matrix:\n");
    scanf("%d",&n);
    printf("\nEnter the elements of matrix:\n");
    for(i=0;i<n;i++)
        for(j=0;j<n;j++)
            scanf("%d",&a[i][j]);
    compute(a,n);
    return 0;
}
void compute(int a[10][10],int n)
{
    int i,j,trace=0,sum;
    float norm;
    for(i=0;i<n;i++)
        trace=trace+a[i][i];
    sum=0;
    for(i=0;i<n;i++)
        for(j=0;j<n;j++)
            sum=sum+a[i][j]*a[i][j];
    norm=sqrt(sum);
}
```

```
printf("\nTrace of the matrix is %d",trace);  
printf("\nNorm of the matrix is %.2f",norm);
```

```
}
```

**Output:**

Enter order of the matrix:

3

Enter the elements of matrix:

3

7

9

2

6

10

8

5

9

Trace of the matrix is 18

Norm of the matrix is 21.19

## //19. sort array of strings

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int main()
{
    char name[10][8], tname[10][8], temp[8];
    int i, j, n;

    printf("Enter the value of n \n");
    scanf("%d", &n);
    printf("Enter %d names n \n", n);

    for (i = 0; i < n; i++)
    {
        scanf("%s", name[i]);
        strcpy(tname[i], name[i]);
    }

    for (i = 0; i < n - 1; i++)
    {
        for (j = i + 1; j < n; j++)
        {
            if (strcmp(name[i], name[j]) > 0)
            {
                strcpy(temp, name[i]);
                strcpy(name[i], name[j]);
                strcpy(name[j], temp);
            }
        }
    }
}
```

```

        }
    }
}

printf("\n-----\n");
printf("Input Names\t Sorted names\n");
printf("-----\n");

for (i = 0; i < n; i++)
{
    printf("%s\t\t%s\n", tname[i], name[i]);
}

printf("-----\n");
return 0;
}

```

**Output:**

Enter the value of n

5

Enter 5 names n

Zahoor

Chandru

Akash

Esther

Sudhir

```

-----
Input Names   Sorted names
-----

```



Zahoor	Akash
Chandru	Chandru
Akash	Esther
Esther	Sudhir
Sudhir	Zahoor

-----

**//20. To convert all upper case to lower case and lower case to upper case in a string**

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
int main()
{
    char s[100],ch;
    int i;

    printf("\nEnter a string : ");
    gets(s);

    for (i = 0; s[i]!='\0'; i++)
    {

        if(s[i] >= 'A' && s[i] <= 'Z')
        {
            s[i] = s[i] + 32;
        }
        else if(s[i] >= 'a' && s[i] <= 'z')
        {
            s[i] = s[i] - 32;
        }
    }
    printf("\nString in Toggle Case =");
    puts(s);
    return 0;
}
```

**Output:**

Enter a string : ChAnDrAjIt

String in Toggle Case =cHaNdRaJiT

**//21 a. To swap two number using call by reference**

```
#include <stdio.h>
#include <stdlib.h>
void callbyref(int *, int *);
int main()
{
    int num1,num2;

    printf("Enter value of num1: ");
    scanf("%d",&num1);
    printf("Enter value of num2: ");
    scanf("%d",&num2);

    //displaying numbers before swapping
    printf("Before Swapping: num1 is: %d, num2 is: %d\n",num1,num2);

    //calling the user defined function swap()
    callbyref(&num1,&num2);

    //displaying numbers after swapping
    printf("After Swapping: num1 is: %d, num2 is: %d\n",num1,num2);
    return 0;
}
void callbyref(int *x,int *y)
{
    int t;
    t = *x;
    *x = *y;
    *y = t;
```

```
}
```

**Output: Call By Reference**

Enter value of num1: 10

Enter value of num2: 20

Before Swapping: num1 is: 10, num2 is: 20

After Swapping: num1 is: 20, num2 is: 10

**//21 b. To swap two number using Call by value**

```
#include <stdio.h>
#include <stdlib.h>
void callbyval(int, int);
int main()
{
    int num1,num2;

    printf("Enter value of num1: ");
    scanf("%d",&num1);
    printf("Enter value of num2: ");
    scanf("%d",&num2);

    //displaying numbers before swapping
    printf("Before Swapping: num1 is: %d, num2 is: %d\n",num1,num2);

    //calling the user defined function swap()
    callbyval(num1,num2);

    //displaying numbers after swapping: It will not swap the actual variables
    printf("After Swapping in main function: num1 is: %d, num2 is: %d\n",num1,num2);
    return 0;
}
void callbyval(int x,int y)
{
    int t;
    t = x;
    x = y;
    y = t;
```

```
//displaying numbers after swapping  
printf("After Swapping: num1 is: %d, num2 is: %d\n",x,y);  
}
```

**Output: Call by Value**

Enter value of num1: 10

Enter value of num2: 20

Before Swapping: num1 is: 10, num2 is: 20

After Swapping: num1 is: 20, num2 is: 10

After Swapping in main function: num1 is: 10, num2 is: 20

## // 22. To Illustrate difference between Structure and Union

```
#include <stdio.h>
#include <stdlib.h>
struct struct_student
{
    int age;
    float percent;
    char name[20];
};

// declaraing union

union union_student
{
    int age;
    float percent;
    char name[20];
};
int main()
{
    // creating variable for structure and union and initializing values
    struct struct_student s={20,75.5,"Mohan Das"};
    union union_student u={18,90,"Karam Chand"};
    //displaying values of structure
    printf("structure data:\n age: %d\n"
           "percent: %.2f\n name: %s\n",
           s.age, s.percent, s.name);
    //displaying values of union
```



```
printf("\nunion data:\n age: %d\n"
      "percent: %.2f\n name: %s\n",
      u.age, u.percent, u.name);

// Displaying the size of struct and union
printf("\nsizeof structure : %d\n", sizeof(s));
printf("sizeof union : %d\n", sizeof(u));
return 0;
}
```

**Output:**

structure data:

age: 20

percent: 75.50

name: Mohan Das

union data:

age: 18

percent: 0.00

name:

sizeof structure : 28

sizeof union : 20

### // 23. To Illustrate Array of Structure

```
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
struct student
{
    int age;
    float percent;
    char name[20];
};
int main()
{
    int i,n=3;
    struct student s[n];

    //accepting all the values of array of structure

    for(i=0;i<n;i++)
    {
        printf("Enter age , percent and name of Structure Student[%d]\n",i);
        scanf("%d%f%s",&s[i].age, &s[i].percent, s[i].name);
    }

    //displaying all the values of array of structure
    for(i=0;i<n;i++)
    printf("structure data S[%d]:\t age: %d\t"
           "\t percent: %.2f\t name: %s\n",i,
           s[i].age, s[i].percent, s[i].name);
```

```
    return 0;  
}
```

**Output:**

Enter age , percent and name of Structure Student[0]

20 76 Mohan

Enter age , percent and name of Structure Student[1]

25 90 Das

Enter age , percent and name of Structure Student[2]

23 99 Karam

structure data S[0]: age: 20 percent: 76.00 name: Mohan

structure data S[1]: age: 25 percent: 90.00 name: Das

structure data S[2]: age: 23 percent: 99.00 name: Karam

#### **// 24. Compute Sum of n numbers in an array using pointers**

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    int i,n, sum=0;
    int *a;
    printf("Enter the total number of elements in array\n ");
    scanf("%d",&n);
    // allocating the size of array
    a = (int *) malloc(n * sizeof(int));
    printf("Enter %d numbers\n",n);
    printf("Enter Elements of the List \n");
    for (i = 0; i < n; i++)
    {
        scanf("%d", a + i);
    }

    /* Compute the sum of all elements in the given array */

    for (i = 0; i < n; i++)
    {
        sum = sum + *(a + i);
        /* this *(a+i) is used to access the value stored at the address*/
    }
    printf("Sum of all the elements of array=%d\n",sum);

    return 0;
```

```
}
```

**Output:**

Enter the total number of elements in array

5

Enter 5 numbers

Enter Elements of the List

1

2

3

4

5

Sum of all the elements of array=15

**// 25. Concatenate two strings using pointers and user defined functions**

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

void concatenate_string(char*, char*);

int main()
{
    char first[100], second[100];

    printf("Enter source string\n");
    gets(first);

    printf("Enter string to concatenate\n");
    gets(second);

    concatenate_string(first, second);

    printf("String after concatenation: \"%s\"\n", first);

    return 0;
}

void concatenate_string(char *first, char *second)
{
    while(*first)
        first++;

    while(*second)
```

```
{  
    *first = *second;  
    second++;  
    first++;  
}  
*first = '\0';  
}
```

**Output:**

Enter source string

MIT

Enter string to concatenate

FGC

String after concatenation: "MITFGC"

**// 26. To create a simple marks card using files**

```
#include <stdio.h>
#include <stdlib.h>
int main()
{
    FILE *fpr;
    /*Char array to store string */
    char name[100], degree[100], str[200];
    float percent;
    /*Opening the file in "r" mode*/
    fpr = fopen("d:\\myfile.txt", "w");

    /*Error handling for file open*/
    if (fpr == NULL)
    {
        printf("Issue in opening the input file");
    }
    printf("Enter the student name and degree\n");
    gets(name);
    gets(degree);
    printf("Enter percentage\n");
    scanf("%f",&percent);
    fprintf(fpr, "%s\t%s\t%f",name, degree,percent);
    fclose(fpr);

    // Read data from file
    fpr = fopen("d:\\myfile.txt", "r");

    /*Error handling for file open*/
```



```
if (fpr == NULL)
{
    printf("Issue in opening the input file");
}
printf("Simple Marks Card\n");
printf("Name\tDegree\tPercent\n");

fscanf(fpr,"%s%s%f", name,degree,&percent);
//Closing the input file after reading
printf("%s\t%s\t%f\n", name, degree, percent);
fclose(fpr);
return 0;
}
```

**Output:**

Enter the student name and degree

Rajesh

BCA

Enter percentage

90

Simple Marks Card

Name Degree Percent

Rajesh BCA 90.000000

## Contents of File:

The screenshot displays a Windows File Explorer window for 'Local Disk (D:)' and a Notepad window titled 'myfile - Notepad'. The File Explorer window shows a list of files and folders. The Notepad window shows the contents of the 'myfile' file.

Name	Date modified	Type	Size
Aktivator!!!	2/11/2021 8:08 AM	File folder	
AppointmentLetters_EQUAMBI	2/13/2021 12:14 AM	File folder	
CLabPrograms	2/16/2021 11:09 AM	File folder	
CLabPrograms2018CBCS	2/16/2021 11:51 AM	Microsoft Word D...	123 KB
coaching4	2/11/2021 4:12 AM	PNG File	351 KB
Letter to reimburse	2/16/2021 12:36 AM	Microsoft Word D...	15 KB
myfile	2/16/2021 11:10 AM	Text Document	1 KB

myfile - Notepad

```
File Edit Format View Help
Rajesh BCA 90.000000
```

7 items

12:03 PM 2/16/2021

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