DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY, LUCKNOW

Solutions of

PROGRAMMING FOR PROBLEM SOLVING

Vol No.1

KCS101T/201T
KCS151P/251P

Learning with Chandan | SS Edutech

Solutions of Programming for Problem Solving

For DR. A.P.J. ABDUL KALAM TECHNICAL UNIVERSITY
LUCKNOW

For Syllabus codes
KCS-101T/201T
KCS-151P/251P

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About Learning with Chandan

Learning with Chandan is an interactive YouTube Channel which regularly shares many useful videos about research writing help. This channel started with a mission to provide quality content about research writing and shares many useful tips like “How to write Literature Review”, “How to write a Research paper”, “How to select a Journal”, etc.

About SS Edutech

"SS EDUTECH" is an online education platform founded by Mr. Arshpreet Singh to teach, learn, inspire and grow. The basic aim is to boost new teachers and provide students a meaningful platform to get knowledge about educational as well as entrepreneurship opportunities around the world. It also provides accounting and taxation services to help people in GST returns, Income Tax returns, Digital Signature Certificate (DSC), EPF and other accounting financial matters.

What is this e-book and why was it created?

The creator of “Learning with Chandan” just got the idea of learning C language. And started to solve random programming problems at beginner level, that when he came across the syllabus of Programming for Problem solving Lab of Dr. APJ Abdul Kalam University, Lucknow. So being a dynamic engineer and learner, he thought of spending one whole night and solving the complete Lab syllabus and putting it online free for everyone. And that’s how this book is created.
The author requests everyone to use this for reference but use your own creative mind, so that the readers can develop their own skills too.

Happy Reading

If you find any mistake in this book or have any other issues, you can contact the author at
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1 KCS101/KCS201- Programming for Problem Solving Lab

1.1 WAP that accepts the marks of 5 subjects and finds the sum and percentage marks obtained by the student.

```c
#include <stdio.h>

int main()
{
    int sub1, sub2, sub3, sub4, sub5;
    printf("WAP to accept the marks of 5 subjects ");
    printf("and finds the sum and percentage marks obtained by the student\n");
    printf("Enter the marks of First subject ");scanf("%d", &sub1);
    printf("Enter the marks of Second subject ");scanf("%d", &sub2);
    printf("Enter the marks of Third subject ");scanf("%d", &sub3);
    printf("Enter the marks of Fourth subject ");scanf("%d", &sub4);
    printf("Enter the marks of Fifth subject ");scanf("%d", &sub5);
    int sum = sub1+sub2+sub3+sub4+sub5;
    float per=(sum/5);
    printf("\nThe total marks obtained by the student are: %d", sum);
    printf("\nThe percentage obtained by the student are: %.2f ", per);
    return 0;
}
```

1.2 WAP that calculates the Simple Interest and Compound Interest. The Principal, Amount, Rate of Interest and Time are entered through the keyboard.

```c
#include <stdio.h>

int main()
{
    int principal, amount, rate, time_val;
    printf("WAP to calculate the simple intrest and compound intrest\n");
    printf("Enter the Principal value ");scanf("%d",&principal);
    printf("Enter the Amount value ");scanf("%d",&amount);
    printf("Enter the Rate of interest value ");scanf("%d",&rate);
    printf("Enter the Time value ");scanf("%d",&time_val);
    float SI = (principal*rate*time_val)/100;
    float CI = amount-principal;
    printf("The Simple Intrest is = %.2f", SI);
    printf("The Compound Intrest is = %.2f", CI);

    return 0;
}
```

1.3 WAP to calculate the area and circumference of a circle.

```c
#include<stdio.h>
void main ()
{
    float radius, area, circumference;
    printf("The program to calculate the area and circumference of the circle");
    printf("\nEnter the radius of the circle ");scanf("%f",&radius);
    area=(22/7)*radius*radius;
    circumference=2*(22/7)*radius;
    printf("\nThe area of the circle is=%.2f",area);
    printf("\nThe circumference of the circle is=%.2f",circumference);
}
```

1.4 WAP that accepts the temperature in Centigrade and converts into Fahrenheit using the formula C/5=(F32)/9.

```c
#include<stdio.h>
void main ()
{
    int centi; float faranheit;
    printf("Enter the temperature in Centigrade ");scanf("%d",&centi);
    faranheit=(((9*centi)/5)+32);
    printf("The temperature in Fahrenhiet is=%f",faranheit);
}
```

1.5 WAP that swaps values of two variables using a third variable.

```c
#include<stdio.h>
void main ()
{
    int a,b,t;t=0;
    printf("WAP that swaps values of two variables using a third variable\n");
    printf("Enter the two variables ");scanf("%d%d",&a,&b);
    t=a;
    a=b;
    b=t;
    printf("The values after swapping is a=%d  b=%d",a,b);
}
```

1.6 WAP that checks whether the two numbers entered by the user are equal or not.

```c
#include <stdio.h>
void main ()
{
    int a,b;
    printf("WAP that checks whether the two numbers are equal or not\n");
    printf("Enter the first number");scanf("%d",&a);
    printf("Enter the second number");scanf("%d",&b);
    if(a==b) printf("The numbers are equal");
    else  printf("The numbers are not equal");
}
```

1.7 WAP to find the greatest of three numbers.

```c
#include <stdio.h>
void main ()
{
    int a,b,c;
    printf("WAP to find the greatest of three numbers\n");
    printf("Enter the first number");scanf("%d",&a);
    printf("Enter the second number");scanf("%d",&b);
    printf("Enter the third number");scanf("%d",&c);
    if(a>b&&a>c) printf("First number is greatest");
    else if (b>a&&b>c) printf("Second number is greatest");
    else printf("Third number is greatest");
}
```

1.8 WAP that finds whether a given number is even or odd.

```c
#include <stdio.h>
void main ()
{
    int a,b,c;
    printf("WAP that finds whether a given number is even or odd\n");
    printf("Enter the number");scanf("%d",&a);
    if(a%2==0) printf("The number is even");
    else printf("The number is odd");
}
```

1.9 WAP that tells whether a given year is a leap year or not.

```c
#include<stdio.h>
void main ()
{
    int a;
    printf("WAP that tells whether a given year is a leap year or not\n");
    printf("Enter the year");scanf("%d",&a);
    if(a%4==0) printf("The year is leap year");
    else printf("The year is not leap year");
}
```

1.10 WAP that accepts marks of five subjects and finds percentage and prints grades according to the criteria.

```c
#include<stdio.h>
void main ()
{
    int s1,s2,s3,s4,s5,sum; float per;
    printf("WAP that accepts marks of five subjects and finds percentage");
    printf("\n and prints grades according to the following criteria: \n");
    printf("Enter marks of the first subject");scanf("%d",&s1);
    printf("Enter marks of the second subject");scanf("%d",&s2);
    printf("Enter marks of the third subject");scanf("%d",&s3);
    printf("Enter marks of the fourth subject");scanf("%d",&s4);
    printf("Enter marks of the fifth subject");scanf("%d",&s5);
    sum=s1+s2+s3+s4+s5;
    per=(sum/500)*100;
    if((per <=100) && (per>=90)) printf("Grade A");
    else if((per<90)&&(per>=80)) printf("Grade B");
    else if((per<80)&&(per>=60)) printf("Grade C");
    else if(per<60) printf("Grade D");

}
```

1.11 WAP that takes two operands and one operator from the user and perform the operation and prints the result by using Switch statement.

```c
#include <stdio.h>
#include <conio.h>
void main()
{
   int a, b, c;
   char ch;
   //clrscr() ;
   printf("Enter your operator(+, -, /, *, %% )\n");
   scanf("%c", &ch);
   printf("Enter the two operands\n");
   scanf("%d%d", &a, &b);

   switch(ch)
   {
      case '+': c = a + b;
        printf("addition of %d and %d is %d",a,b, c);
        break;
      case '-': c = a - b;
         printf("substraction %d and %d is %d", a,b,c);
         break;
      case '*': c = a * b;
         printf("multiplication of %d and %d is %d",a,b, c);
         break;
      case '/': c = a / b;
         printf("remainder of %d and %d is %d",a,b, c);
         break;
      case '%': c = a % b;
         printf("quotient of %d and %d is %d",a,b, c);
         break;
      default: printf("Invalid operator");
         break;
   }
   getch();
}
```

1.12 WAP to print the sum of all numbers up to a given number.

```c
#include <stdio.h>
void main ()
{
    int n,i,sum;sum=0;
    printf("WAP to print the sum of all numbers up to a given number\n");
    printf("\nEnter the number "); scanf("%d",&n);
    for(i=0;i<=n;i++) sum=sum+i;
    printf("The sum till here is = %d",sum);
}
```

1.13 WAP to find the factorial of a given number..

```c
#include <stdio.h>
void main ()
{
    int n,i,sum;sum=1;
    printf("WAP to find the factorial of a given number\n");
    printf("\nEnter the number"); scanf("%d",&n);
    for(i=1;i<=n;i++) sum=sum*i;
    printf("The factorial of %d is=%d",n,sum);
}
```

1.14 WAP to print sum of even and odd numbers from 1 to N numbers.

```c
#include <stdio.h>
void main ()
{
    int n,i,sum_odd,sum_even;sum_odd=sum_even=0;
    printf("WAP to print sum of even and odd numbers from 1 to N numbers\n");
    printf("\nEnter the number"); scanf("%d",&n);
    for(i=1;i<=n;i++)
    {
     if(i%2==0) sum_even=sum_even+i;
     else sum_odd=sum_odd+i;
    }
    printf("Sum of even numbers is=%d\n",sum_even);
    printf("Sum of odd numbers is=%d\n",sum_odd);
}
```

1.15 WAP to print the Fibonacci series.

```c
#include<stdio.h>
void main ()
{
    int i,n,a,b,c;
    a=0;b=1;c=a+b;
    printf("WAP to print the Fibonacci series\n");
    printf("\nEnter the number "); scanf("%d",&n);
    printf("%d\n",a);
    printf("%d\n",b);
    for(i=0;i<n;i++)
    {
        printf("%d\n",c);
        a=b;
        b=c;
        c=a+b;
    }

}
```

1.16 WAP to check whether the entered number is prime or not.

```c
#include<stdio.h>
void main ()
{
    int i,n,flag=0;

    printf("WAP to check whether the entered number is prime or not\n");
    printf("\nEnter the number"); scanf("%d",&n);

    for (i = 2; i <= n / 2; ++i)
        {
            if (n % i == 0)
            {
                flag = 1;
                break;
                }
        }

    if (n == 1)
        {
        printf("1 is neither prime nor composite.");
        }
    else
    {
        if (flag == 0)
            printf("%d is a prime number.", n);
        else
            printf("%d is not a prime number.", n);
    }

}
```

1.17 WAP to find the sum of digits of the entered number.

```c
#include<stdio.h>
void main ()
{
    int n,res,sum;
    sum=res=0;
    printf("WAP to find the sum of digits of the entered number\n");
    printf("\nEnter the number "); scanf("%d",&n);
    while(n>0)
    {
        res=n%10;
        sum=sum+res;
        n=n/10;
    }
    printf("The sum of the numbers is =%d",sum);
}
```

1.18 WAP to find the reverse of a number

```c
#include<stdio.h>
void main ()
{
    int number;
    printf("WAP to find the reverse of a number\n");
    printf("Enter the number ");scanf("%d", &number);
    int n = number;
    while (n>0)
    {
        int res = n%10;
        printf("%d", res);
        n=n/10;
    }

}
```

1.19 WAP to print Armstrong numbers from 1 to 100.

```c
#include <math.h>
#include <stdio.h>
void main() {
   int startPoint, endPoint, number, originalNumber, rem, count = 0;
   double result = 0.0;
    startPoint =0; endPoint=100;
   printf("Armstrong numbers between %d and %d are: ", startPoint, endPoint);
   for (number = startPoint + 1; number < endPoint; ++number) {
      originalNumber = number;
      while (originalNumber != 0)
      {
         originalNumber /= 10;
         ++count;
      }
      originalNumber = number;
      while (originalNumber != 0) {
         rem = originalNumber % 10;
         result += pow(rem, count);
         originalNumber /= 10;
      }
      if ((int)result == number) {
         printf("%d ", number);
      }
      count = 0;
      result = 0;
   }
}
```

1.20 WAP to convert binary number into decimal number.

```c
#include <stdio.h>
#include <math.h>
 void main() {
   int input_number;
    printf("Enter the Binary number to be converted to Decimal  " );
    scanf("%d", &input_number);
    int dec=0, i=0, rem;
    while(input_number!=0)
    {
       rem = input_number%10;
       input_number=input_number/10;
       dec=dec + rem*pow(2,i);
       ++i;
    }
    printf("The number converted to Decimal is = %d", dec);
}
```

1.21 WAP that simply takes elements of the array from the user and finds the sum of these elements

```c
#include <stdio.h>
#include <math.h>
 void main() {
   int i,SIZE,sum=0;
   printf("Enter the number of elements in the array "); scanf("%d", &SIZE);
   int a[SIZE];
   printf("Enter the elements of the array ");
   for (i=0;i<SIZE;i++) scanf("%d", &a[i]);

   printf("Printing the array");
   for (i=0;i<SIZE;i++) printf("%d  ", a[i]);
   for (i=0;i<SIZE;i++) sum=sum+a[i];
   printf("The sum of elements of the array are : %d", sum);

}
```

1.22 WAP that inputs two arrays and saves sum of corresponding elements of these arrays in a third array and prints them

```c
#include <stdio.h>
 void main() {
   int SIZE,i;
   printf("Enter the size of the array ");scanf("%d",&SIZE);
   int first_array[SIZE];
   int second_array[SIZE];
   int sum_array[SIZE];

   printf("Enter the elements of the first array ");
   for (i=0;i<SIZE;i++) scanf("%d",&first_array[i]);
   printf("Enter the elements of the second array ");
   for (i=0;i<SIZE;i++) scanf("%d",&second_array[i]);
   for (i=0;i<SIZE;i++) sum_array[i]=first_array[i]+second_array[i];
   printf("The sum of two arrays are: ");
   for (i=0;i<SIZE;i++) printf("%d\n",sum_array[i]);

}
```

1.23 WAP to find the minimum and maximum element of the array.

```c
#include <stdio.h>
 void main() {
   int SIZE,i;
   printf("Enter the size of the array ");scanf("%d",&SIZE);
   int array[SIZE];
   printf("Enter the elements of the array ");
   for (i=0;i<SIZE;i++) scanf("%d",&array[i]);
   int min= array[0];
   int max = array[0];
   for (i=0;i<SIZE;i++)
   {
       if (array[i]<min) min=array[i];
       if (array[i]>max) max=array[i];
   }
   printf("The minimum element is %d \n", min);
   printf("The maximum element is %d", max);
}
```

1.24 WAP to search an element in an array using Linear Search.

```c
#include <stdio.h>
 void main() {
   int SIZE,i, element, index=-1;
   printf("Enter the size of the array ");
   scanf("%d",&SIZE);
   int array[SIZE];

   printf("Enter the elements of the array ");
   for (i=0;i<SIZE;i++) scanf("%d",&array[i]);

   printf("Enter the element to be searched ");
   scanf("%d", &element);
   for(i=0;i<SIZE;i++)
   {
     if (array[i]==element)
     printf("Element %d found at position %d\n", element , (i+1));
   }
}
```

1.25 WAP to sort the elements of the array in ascending order using Bubble Sort technique.

```c
#include<stdio.h>
void bubble_sort(int arr[]);
int MAX;

void main(void)
{

    printf("Enter the elements you wish to enter ");scanf("%d", &MAX);
    int arr[MAX];
    printf("Enter the elements of the array");
    for(int i = 0; i < MAX; i++) scanf("%d", &arr[i]);
    bubble_sort(arr);
    printf("\n\nSorted array: \n");
    for(int i = 0; i < MAX; i++) printf("%d ", arr[i]);
}

void bubble_sort(int arr[])
{
    int tmp,is_swapped;
    for(int i = 0; i < MAX; i++)
    {
        is_swapped = 0;
        for(int j = 0; j < MAX - 1 - i; j++)
        {
            if(arr[j] > arr[j+1])
            {
                tmp = arr[j];
                arr[j] = arr[j+1];
                arr[j+1] = tmp;
                is_swapped = 1;
            }
        }
        if (!is_swapped)
        {
            break;
        }
    }
}
```

1.26 WAP to add and multiply two matrices of order n x n.

```c
#include<stdio.h>
void main()
{
    int first_matrix[10][10],second_matrix[10][10],mul[10][10],r,c,i,j,k;
    printf("enter the number of row=");scanf("%d",&r);
    printf("enter the number of column=");scanf("%d",&c);
    printf("enter the first matrix element=\n");
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)    scanf("%d",&first_matrix[i][j]);
    }
    printf("enter the second matrix element=\n");
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)    scanf("%d",&second_matrix[i][j]);
    }
    printf("multiply of the matrix=\n");
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            mul[i][j]=0;
            for(k=0;k<c;k++)
            {
                mul[i][j]+=first_matrix[i][k]*second_matrix[k][j];
            }
        }
    }
    for(i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            printf("%d\t",mul[i][j]);
        }
        printf("\n");
    }
}
```

1.27 WAP that finds the sum of diagonal elements of a m x n matrix.

```c
#include <stdio.h>
void main()
{
    int r,c,sum=0,i,j;
    printf("enter the number of row=");scanf("%d",&r);
    printf("enter the number of column=");scanf("%d",&c);
    int matrix[r][c];
    printf("enter the  matrix elements=\n");
    for (i=0;i<r;i++)
    {
        for(j=0;j<c;j++) scanf("%d", &matrix[i][j]);
    }

    for (i=0;i<r;i++)
    {
        for(j=0;j<c;j++)
        {
            if (i==j) sum = sum + matrix[i][j];
        }
    }
    printf("The sum of the diagonal elements are: %d", sum);
}
```

1.28 WAP to implement strlen (), strcat (),strcpy ()

```c
#include <stdio.h>
#include <string.h>
void main()
{

    char string[200], string_to_add[200], new_string[200];
    printf("Enter the string "); scanf("%s", &string);
    printf("The entered string is %s", string);
    printf("\nThe length of entered string is %d", (int)strlen(string));
    printf("\nEnter the string to add to %s = ", string);
    scanf("%s", &string_to_add);
    printf("The string to add is = %s", string_to_add);
    strcat (string, " ");
    strcat (string, string_to_add);
    printf("\nThe new string is "); puts(string);
    strcpy(new_string, string);
    printf("\n\nThe new string is = "); puts(new_string);
}
```

1.29 WAP to swap two elements using the concept of pointers.

```c
#include <stdio.h>
void swap(int *x,int *y)
{
    int t;
     t   = *x;
    *x   = *y;
    *y   =  t;
}

int main()
{
    int number1,number2;
    printf("Enter value of number1: ");
    scanf("%d",&number1);
    printf("Enter value of number2: ");
    scanf("%d",&number2);
    printf("Before Swapping: \nnumber1 is: %d, number2 is: %d\n",number1,number2);
    swap(&number1,&number2);
    printf("After  Swapping: \nnumber1 is: %d, number2 is: %d\n",number1,number2);

    return 0;
}
```

1.30 WAP to compare the contents of two files and determine whether they are same or not.

```c
#include<stdio.h>

int main() {
   FILE *fp1, *fp2;
   int ch1, ch2;
   char fname1[40], fname2[40];

   printf("Enter name of first file :");
   gets(fname1);

   printf("Enter name of second file:");
   gets(fname2);

   fp1 = fopen(fname1, "r");
   fp2 = fopen(fname2, "r");

   if (fp1 == NULL) {
      printf("Cannot open %s for reading ", fname1);
      exit(1);

   }
```

```
22      else if (fp2 == NULL)
23      {
24         printf("Cannot open %s for reading ", fname2);
25         exit(1);
26      }
27      else
28      {
29         ch1 = getc(fp1);
30         ch2 = getc(fp2);
31
32         while ((ch1 != EOF) && (ch2 != EOF) && (ch1 == ch2))
33         {
34            ch1 = getc(fp1);
35            ch2 = getc(fp2);
36         }
37
38         if (ch1 == ch2)
39            printf("Files are identical n");
40         else if (ch1 != ch2)
41            printf("Files are Not identical n");
42
43         fclose(fp1);
44         fclose(fp2);
45      }
46      return (0);
47   }
```

1.31 WAP to check whether a given word exists in a file or not. If yes then find the number of times it occurs.

```c
#include <stdio.h>
void main()
{

        FILE* filePointer;
        int wordExist=0;
        int bufferLength = 255;
        char search[100];
        printf("Enter word to be search=");
        scanf("%s",search);
        char line[bufferLength];
        filePointer = fopen("D:\\file.txt", "r");
        while(fgets(line, bufferLength, filePointer))
        {
                char *ptr = strstr(line, search);
                if (ptr != NULL)
                {
                        wordExist=1;
                        break;
                }
        }
        fclose(filePointer);
        if (wordExist==1)
        {
                printf("Word exists.");
        }
        else
        {
                printf("Word doesn't exist.");
        }
}
```

2 KCS-151P/KCS-251P- Programming for Problem Solving Lab

2.1 LAB1. Write a program to calculate the area of triangle using formula at=sqrt(s(s-a)(s-b)(s-c))

```c
#include <stdio.h>
#include <math.h>

void main()
{
    int a, b,c,s;
    printf("Enter the side A "); scanf("%d",&a);
    printf("Enter the side B "); scanf("%d",&b);
    printf("Enter the side C "); scanf("%d",&c);
    s = (a+b+c)/2;
    float area = sqrt(s*(s-a)*(s-b)*(s-c));
    printf("The area of the circle is = %.2f", area);
}
```

2.2 LAB1. Basic salary of an employee is input through the keyboard. The DA is 25percent of the basic salary while the HRA is 15 percent of the basic salary. Provident Fund is deducted at the rate of 10 percent of the gross salary (BS+DA+HRA).Program to calculate the Net Salary.

```c
#include <stdio.h>
#include <math.h>

void main()
{
    int salary;
    printf("Enter the basic salary of the employee "); scanf("%d",&salary);
    float DA = 0.25 * salary;
    float HRA = 0.15 * salary;
    float gross_salary = salary + DA + HRA;
    float PF = gross_salary * 0.10;
    float total_salary = gross_salary - PF;
    printf("The DA is %.2f", DA);
    printf("\nThe HRA is %.2f", HRA);
    printf("\nThe Gross Salary is %.2f", gross_salary);
    printf("\nThe PF is %.2f", PF);
    printf("\nThe total Salary is %.2f", total_salary);
}
```

2.3 LAB1. Write a program to determine the roots of quadratic equation.

```c
#include <math.h>
#include <stdio.h>
void main() {
    double a, b, c, discriminant, root1, root2, realPart, imagPart;
    printf("Enter coefficients a, b and c: ");
    scanf("%lf %lf %lf", &a, &b, &c);
    discriminant = b * b - 4 * a * c;
    if (discriminant > 0) {
        root1 = (-b + sqrt(discriminant)) / (2 * a);
        root2 = (-b - sqrt(discriminant)) / (2 * a);
        printf("root1 = %.2lf and root2 = %.2lf", root1, root2);
    }
    else if (discriminant == 0) {
        root1 = root2 = -b / (2 * a);
        printf("root1 = root2 = %.2lf;", root1);
    }
    else {
        realPart = -b / (2 * a);
        imagPart = sqrt(-discriminant) / (2 * a);
        printf("root1 = %.2lf + %.2lfi ", realPart, imagPart);
        printf("root2 = %.2lf - %.2lfi ", realPart, imagPart);
    }
}
```

2.4 LAB1.Write a program to find the largest of three numbers using nested if else.

```c
#include <math.h>
#include <stdio.h>
void main() {
    int num1, num2, num3;
    printf("Enter the first number "); scanf("%d", &num1);
    printf("Enter the second number "); scanf("%d", &num2);
    printf("Enter the third number  "); scanf("%d", &num3);

    if (num1>num2)
    {
        if (num1>num3) printf("%d is the largest", num1);
    }
    else if (num2>num1)
    {
        if (num2>num3) printf("%d is the largest", num2);
    }
    else printf("%d is the largest", num3);
}
```

2.5 LAB1.Write a program to receive marks of physics, chemistry and maths from user and check its eligibility for course

```c
#include <math.h>
#include <stdio.h>
void main() {
    int physics, maths, chemistry;
    printf("Enter the marks of Physics "); scanf("%d", &physics);
    printf("Enter the marks of Chemistry "); scanf("%d", &chemistry);
    printf("Enter the marks of Maths "); scanf("%d", &maths);
    if (physics>40 && chemistry >50 && maths >60)
    {
        if ((physics+maths)>150 && (physics+maths+ chemistry)>200)
        {
            printf("You are eligible");
        }
    }
    else printf("You are not eligible");
}
```

2.6 LAB2.Write a program to find the value of y for a particular value of n. The a, x, b, n is input by user

```c
#include <math.h>
#include <stdio.h>
void main() {
    int a,b,x,y,n;
    while (1)
    {
        printf("Enter the value of a "); scanf("%d", &a);
        printf("Enter the value of x "); scanf("%d", &x);
        printf("Enter the value of b "); scanf("%d", &b);
        printf("Enter 1 for y=ax+b; Enter 2 for y=ax2+b2;\n");
        printf("Enter 3 for y=a-bx; Enter 4 for y=a+x/b;\n");
        printf("Enter the value of n "); scanf("%d", &n);
        if (n==1)
        {
            y=a*x+b;
            printf("The value of y is =%d", y);
        }
        if (n==2)
        {
            y=(a*x*x) + (b*x*x);
            printf("The value of y is =%d", y);
        }
        if (n==3)
        {
            y=a-(b*x);
            printf("The value of y is =%d", y);
        }
        if (n==4)
        {
            y=a+(x/b);
            printf("The value of y is =%d", y);
        }

    }
}
```

2.7 LAB2.Write a program to construct a Fibonacci series upto n terms.

```c
#include<stdio.h>
void main ()
{
    int i,n,a,b,c;
    a=0;b=1;c=a+b;
    printf("WAP to print the Fibonacci series\n");
    printf("\nEnter the number "); scanf("%d",&n);
    printf("%d\t",a);
    printf("%d\t",b);
    for(i=0;i<n;i++)
    {
        printf("%d\t",c);
        a=b;
        b=c;
        c=a+b;
    }
}
```

2.8 LAB2.Write a program to find whether the number is Armstrong number.

```c
#include <stdio.h>
void main() {
    int num, originalNum, remainder, result = 0;
    printf("Enter a three-digit integer: ");
    scanf("%d", &num);
    originalNum = num;
    while (originalNum != 0) {
        remainder = originalNum % 10;
        result += remainder * remainder * remainder;
        originalNum /= 10;
    }
    if (result == num)
        printf("%d is an Armstrong number.", num);
    else
        printf("%d is not an Armstrong number.", num);

}
```

2.9 LAB2.Write a program to generate sum of series 1!+2!+3!+————————n!

```c
#include <stdio.h>
int factorial (int);
void main() {
    int i,n,sum=0;
    printf("Enter the value of n "); scanf("%d", &n);
    for (i=1;i<=n;i++)
    {
        sum = sum + factorial(i);
    }
    printf("The Sum is %d", sum);
}

int factorial (int a)
{
    int multi=1;
    for (int j =1; j<=a; j++)
    {
        multi = multi * j;
    }
    return multi;
}
```

2.10 LAB2.Write a program to find the sum of following series 1-X1/1!+X2/2!-.....Xn/n!.

```c
#include <stdio.h>
#include <math.h>
int factorial (int);
void main() {
    int i,n,x,sum=0;
    printf("Enter the value of n "); scanf("%d", &n);
    printf("Enter the value of x "); scanf("%d", &x);
    for (i=1;i<=n;i++)
    {
        if (i%2==0)
        {
            sum = sum + (pow (x,i)/factorial(i));
        }
        else
        {
            sum = sum - (pow (x,i)/factorial(i));
        }
    }
    printf("The Sum is %d", sum);
}

int factorial (int a)
{
    int multi=1;
    for (int j =1; j<=a; j++)
    {
        multi = multi * j;
    }
    return multi;
}
```

2.11 LAB3.Write a program to print the entire prime no between 1 and 300.

```c
#include <stdio.h>

int main()
{
  int i, Number, count;
  for(Number = 1; Number <= 300; Number++)
  {
    count = 0;
    for (i = 2; i <= Number/2; i++)
    {
          if(Number%i == 0)
          {
               count++;
            break;
        }
    }
    if(count == 0 && Number != 1 )
    {
        printf(" %d ", Number);
    }
  }
  return 0;
}
```

2.12 LAB3.Write a program to print out all the Armstrong number between 100 and 500.

```c
#include <math.h>
#include <stdio.h>
void main() {
   int startPoint, endPoint, number, originalNumber, rem, count = 0;
   double result = 0.0;
    startPoint =100; endPoint=500;
   printf("Armstrong numbers between %d and %d are: ", startPoint, endPoint);
   for (number = startPoint + 1; number < endPoint; ++number) {
      originalNumber = number;
      while (originalNumber != 0)
      {
         originalNumber /= 10;
         ++count;
      }
      originalNumber = number;
      while (originalNumber != 0) {
         rem = originalNumber % 10;
         result += pow(rem, count);
         originalNumber /= 10;
      }
      if ((int)result == number) {
         printf("%d ", number);
      }
      count = 0;
      result = 0;
   }
}
```

2.13 LAB3.Write a program to draw the following figure:

3 2 1
21
1

*
**

```c
#include <stdio.h>
void main() {

   int i,j;
   for (i=3;i>0;i--)
   {
       for (j=i;j>0;j--) printf("%d\t",j);
       printf("\n");
   }
   for(i=0;i<=3;i++)
   {
       for (j=1;j<=i;j++) printf("*\t");
       printf("\n");
   }
}
```

2.14 LAB3.Write a program to receive a five-digit no and display as like 24689

```c
#include <stdio.h>
void main()
{
    char number[100];
    int i=0;
    printf("Enter the number "); scanf("%s", &number);
    while(number[i]!='\0')
    {
        printf("%c\n", number[i]);
        i++;
    }
}
```

2.15 LAB4.Write a function that return sum of all the odd digits of a given positive no entered through keyboard.

```c
#include <stdio.h>
void main()
{
    int number, res, sum;
    printf("Enter the number "); scanf("%d", &number);
    while(number>0)
    {
        res = number%10;
        if (res%2!=0) sum=sum+res;
        number= number/10;
    }
    printf("The sum of numbers is = %d", sum);
}
```

2.16 LAB4.Write a program to print area of rectangle using function and return its value to main function.

```c
#include <stdio.h>
int area(int, int);
void main()
{
    int length, breathe;
    printf("Enter the length of the rectangle "); scanf("%d", &length);
    printf("Enter the breathe of the rectangle "); scanf("%d", &breathe);
    int area_calc = area(length,breathe);
    printf("Area of rectangle is = %d", area_calc);
}

int area(int l, int b)
{
    return (l*b);
}
```

2.17 LAB4.Write a program to calculate the factorial for given number using function.

```c
#include <stdio.h>
int fact(int);
void main()
{
    int number, factorial=1;
    printf("Enter the number whose factorial has to be found out ");
    scanf("%d", &number);
    printf("Factorial of %d  = %d", number, fact(number));
}

int fact(int n)
{
    int i, sum=1;
    for(i=1;i<=n;i++) sum = sum*i;
    return sum;
}
```

2.18 LAB4.Write a program to find sum of Fibonacci series using function.

```c
#include<stdio.h>
void main ()
{
    int i,n,a,b,c,sum=0;
    a=0;b=1;c=a+b;
    printf("WAP to print the sum of Fibonacci series\n");
    printf("Enter the number "); scanf("%d",&n);
    printf("%d\t",a);
    printf("%d\t",b);
    for(i=0;i<n;i++)
    {
        printf("%d\t",c);
        sum=sum+c;
        a=b;
        b=c;
        c=a+b;
    }
    printf("\nThe sum of the series is =%d", sum);
}
```

2.19 LAB4.Write factorial function and use the function to find the sum of series S=1!+2!+——n!.

```c
#include <stdio.h>
int fact(int);
void main()
{
    int number, factorial=1, sum_fact=1,i;
    printf("Enter the value of n "); scanf("%d", &number);
    for (i=1;i<=number;i++)
    {
        sum_fact = sum_fact + fact(i);
    }
    printf("The sum of the series = %d", sum_fact);

}

int fact(int n)
{
    int i, sum=1;
    for(i=1;i<=n;i++) sum = sum*i;
    return sum;
}
```

2.20 LAB5.Write a program to find the factorial of given number using recursion.

```c
#include<stdio.h>
int rec(int);
void main ()
{
    int a, fact;
    printf("Enter any number ");
    scanf("%d", &a);
    fact= rec(a);
    printf("Factorial value = %d", fact);
}

int rec(int x)
{
    int f;
    if(x==1) return (1);
    else
    {
        f=x*rec(x-1);
    }
    return (f);
}
```

2.21 LAB5.Write a program to find the sum of digits of a 5 digit number using recursion.

```c
#include <stdio.h>
int sum (int a);
int main()
{
    int num, result;
    printf("Enter the number: ");
    scanf("%d", &num);
    result = sum(num);
    printf("Sum of digits in %d is %d\n", num, result);
    return 0;
}

int sum (int num)
{
    if (num != 0)
    {
        return (num % 10 + sum (num / 10));
    }
    else
    {
       return 0;
    }
}
```

2.22 LAB5.Write a program to calculate the GCD of given numbers using recursion.

```c
#include <stdio.h>
int hcf(int , int );
int main() {
    int n1, n2;
    printf("Enter two positive integers: ");
    scanf("%d %d", &n1, &n2);
    printf("G.C.D of %d and %d is %d.", n1, n2, hcf(n1, n2));
    return 0;
}

int hcf(int n1, int n2) {
    if (n2 != 0)
        return hcf(n2, n1 % n2);
    else
        return n1;
}
```

2.23 LAB5.Write a program to convert decimal number in to binary number.

```c
#include <stdio.h>
int main ()
{
    int n,i;int a[10];
    printf("Enter the Decimal number to convert to Binary ");
    scanf("%d",&n);
    for(i=0;n>0;i++)
    {
        a[i]=n%2;
        n=n/2;
    }
    printf("\nBinary of Given Number is=");
    for(i=i-1;i>=0;i--)
        {
        printf("%d",a[i]);
        }
    printf("\n");
    return 0;
}
```

2.24 LAB5.Write a program to convert binary number in to decimal number.

```c
#include <math.h>
#include <stdio.h>
int main ()
{
    int input_number;
    printf("Enter the Binary number to be converted to Decimal  " );
    scanf("%d", &input_number);
    int dec=0, i=0, rem;
    while(input_number!=0)
    {
       rem = input_number%10;
       input_number=input_number/10;
       dec=dec + rem*pow(2,i);
       ++i;
    }
    printf("The number converted to Decimal is = %d", dec);
}
```

2.25 LAB6.Write a program to delete duplicate element in a list of 10 elements and display it on screen.

```c
#include <stdio.h>
int main()
{
  int n=10, count = 0;
  int arr[n], temp[n];
  printf("Enter the 10 numbers");
  for(int i=0;i<n;i++)
  {
      scanf("%d",&arr[i]);
  }
  printf("\nList Before Removing Duplicates: ");
  for (int i = 0; i < n; i++)
    printf("%d ", arr[i]);

  for (int i = 0; i < n; i++)
  {
    int j;
    for (j = 0; j < count; j++)
    {
      if (arr[i] == temp[j])
        break;
    }
    if (j == count)
    {
      temp[count] = arr[i];
      count++;
    }
  }

  printf("\nList After Removing Duplicates: ");
  for (int i = 0; i < count; i++)
  printf("%d ", temp[i]);
  return 0;
}
```

2.26 LAB6.Write a program to merge two sorted array and no element is repeated during merging.

```c
#include <stdio.h>
void main()
{
    int array1[50], array2[50], array3[100], m, n, i, j, k = 0;
    printf("\n Enter size of array Array 1: ");
    scanf("%d", &m);
    printf("\n Enter sorted elements of array 1: \n");
    for (i = 0; i < m; i++)
    {
        scanf("%d", &array1[i]);
    }
    printf("\n Enter size of array 2: ");
    scanf("%d", &n);
    printf("\n Enter sorted elements of array 2: \n");
    for (i = 0; i < n; i++)
    {
        scanf("%d", &array2[i]);
    }
    i = 0;j = 0;
    while (i < m && j < n)
    {
        if (array1[i] < array2[j])
            {
                array3[k] = array1[i];
                i++;
            }
        else
            {
                array3[k] = array2[j];
                j++;
            }
        k++;
    }

    if (i >= m)
    {
        while (j < n)
            {
                array3[k] = array2[j];
                j++;
                k++;
            }
    }

    if (j >= n)
    {
        while (i < m)
```

```
48              {
49                  array3[k] = array1[i];
50                  i++;
51                  k++;
52              }
53      }
54
55      printf("\n After merging: \n");
56      for (i = 0; i < m + n; i++)
57          {
58              printf("\n%d", array3[i]);
59          }
60
61  }
```

2.27 LAB6.Write a program to evaluate the addition of diagonal elements of two square matrixes.

```c
#include<stdio.h>
int main()
{
        int i, j, rows, columns, a[10][10], Sum1 = 0, b[10][10], Sum2=0;

        printf("\nPlease Enter No. of rows and columns of Matix 1  : ");
        scanf("%d %d", &i, &j);
        printf("\nPlease Enter the Matrix Elements of Matrix 1 \n");
        for(rows = 0; rows < i; rows++)
         {
                 for(columns = 0;columns < j;columns++)
                 scanf("%d", &a[rows][columns]);
         }
        for(rows = 0; rows < i; rows++) Sum1 = Sum1 + a[rows][rows];
    printf("\nThe Sum of Diagonal Elements of a Matrix 1 =  %d", Sum1 );

    printf("\nPlease Enter Number of rows and columns of Matix 2  : ");
        scanf("%d %d", &i, &j);
        printf("\nPlease Enter the Matrix Elements of Matrix 2 \n");
        for(rows = 0; rows < i; rows++)
         {
                 for(columns = 0;columns < j;columns++)
                 scanf("%d", &b[rows][columns]);
         }
        for(rows = 0; rows < i; rows++) Sum2 = Sum2 + b[rows][rows];
    printf("\nThe Sum of Diagonal Elements of a Matrix 2 =  %d", Sum2 );
    printf("\nThe Sum of Diagonal Elements both matrix =  %d", (Sum1+Sum2));
    return 0;
}
```

2.28 LAB6.Write a program to find the transpose of a given matrix and check whether it is symmetric or not.

```c
#include <stdio.h>
#define SIZE 3
int main()
{
    int A[SIZE][SIZE];int B[SIZE][SIZE], transpose[SIZE][SIZE];
    int row, col, isSymmetric;
    printf("Enter elements in matrix of size 3x3: \n");
    for(row=0; row<SIZE; row++)
    {
        for(col=0; col<SIZE; col++) scanf("%d", &A[row][col]);
    }
    for(row=0; row<SIZE; row++)
    {
        for(col=0; col<SIZE; col++) B[row][col] = A[col][row];
    }
    printf("\nTranspose of the matrix:\n");
    for (row = 0; row < SIZE; ++row)
        for (col = 0; col < SIZE; ++col) {
            printf("%d  ", transpose[row][col]);
            if (col == SIZE - 1)
                printf("\n");
        }
    isSymmetric = 1;
    for(row=0; row<SIZE && isSymmetric; row++)
    {
        for(col=0; col<SIZE; col++)
        {
            if(A[row][col] != B[row][col]) isSymmetric = 0;break;
        }
    }
    if(isSymmetric == 1)
    {
        printf("\nThe given matrix is Symmetric matrix: \n");
        for(row=0; row<SIZE; row++)
        {
            for(col=0; col<SIZE; col++)
            {
                printf("%d ", A[row][col]);
            }

            printf("\n");
        }
        }
    else printf("\nThe given matrix is not Symmetric matrix.");
    return 0;
}
```

2.29 LAB6.Write a program to print the multiplication of two N*N (Square) matrix.

```c
#include <stdio.h>
void getMatrixElements(int matrix[][10], int row, int column) {

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

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

void multiplyMatrices(int first[][10],
                      int second[][10],
                      int result[][10],
                      int r1, int c1, int r2, int c2) {


   for (int i = 0; i < r1; ++i)
   {
      for (int j = 0; j < c2; ++j)
      {
         result[i][j] = 0;
      }
   }


   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];
         }
      }
   }
}

void display(int result[][10], int row, int column) {

   printf("\nOutput Matrix:\n");
   for (int i = 0; i < row; ++i) {
      for (int j = 0; j < column; ++j) {
```

```
            printf("%d  ", result[i][j]);
            if (j == column - 1)
               printf("\n");
         }
      }
   }

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);
   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);
   }
    getMatrixElements(first, r1, c1);
   getMatrixElements(second, r2, c2);
   multiplyMatrices(first, second, result, r1, c1, r2, c2);
   display(result, r1, c2);
    return 0;
}
```

2.30 LAB7.Write a program in C to check whether the given string is a palindrome or not.

```c
#include <stdio.h>
#include <string.h>
void isPalindrome(char*);
int main()
{
    char string[200];
    printf("Enter the string: ");
    scanf("%s", &string);
    printf("The given string is ");
    isPalindrome(string);
    return 0;
}


void isPalindrome(char str[])
{
    int l = 0;
    int h = strlen(str) - 1;
    while (h > l)
    {
        if (str[l++] != str[h--])
        {
            printf("%s is Not Palindrome", str);
            return;
        }
    }
    printf("%s is palindrome", str);
}
```

2.31 LAB7.Write program to sort the array of character (String) in alphabetical order like STRING in GINRST.

```c
#include <stdio.h>
#include <string.h>
int main (void)
{
   char string[200];
   printf("Enter the string: "); scanf("%s", &string);
   char temp;int i, j;
   int n = strlen(string);
   printf("String before sorting - %s \n", string);

   for (i = 0; i < n-1; i++) {
      for (j = i+1; j < n; j++) {
         if (string[i] > string[j]) {
            temp = string[i];
            string[i] = string[j];
            string[j] = temp;
         }
      }
   }
   printf("String after sorting  - %s \n", string);
   return 0;
}
```

2.32 LAB7.Write a program to remove all the blank space from the string and print it,also count the no of characters.

```c
#include <stdio.h>
#include <string.h>
int main()
{
    char s[1000];
    int  i,k=0;
    printf("Enter  the string : ");
    gets(s);
    for(i=0;s[i];i++)
    {
              s[i]=s[i+k];
              if(s[i]==' '|| s[i]=='\t')
              {
                   k++;
                   i--;
             }
    }
    printf("string after removing all blank spaces:");
    printf("%s",s);
    printf("\nThe number of characters in the string is = %d", (int)strlen(s));
         return 0;
}
```

2.33 LAB7.Write a program to store the following string “zero”, “one” ——-“five”.Print the no in words, given in figure as 3205.

```c
#include <stdio.h>
#include <string.h>
int main()
{
   char number[20]; int len=0,i;
    printf("Enter the number "); scanf("%s", &number);
    len = strlen(number);
    for (i=0;i<len;i++)
    {
        switch (number[i])
        {
            case '1': printf("one\t");break;
            case '2': printf("two\t");break;
            case '3': printf("three\t");break;
            case '4': printf("four\t");break;
            case '5': printf("five\t");break;
            case '6': printf("six\t");break;
            case '7': printf("seven\t");break;
            case '8': printf("eight\t");break;
            case '9': printf("nine\t");break;
            case '0': printf("zero\t");break;
            default:  printf("wrong\t");break;
        }
    }
         return 0;
}
```

2.34 LAB8.Write a program to compare two given dates. To store a date uses a structure that contains three members namely day, month and year. If the dates are equal then display message equal otherwise unequal.

```c
#include<stdio.h>
#include<conio.h>

struct date
{
    int day;
    int month;
    int year;
};

int main()
{
    struct date d1,d2;

    printf("Enter first date(dd mm yyyy):");
    scanf("%d%d%d",&d1.day, &d1.month, &d1.year);
    printf("\nEnter second date(dd mm yyyy):");
    scanf("%d%d%d",&d2.day,&d2.month,&d2.year);

    if((d1.day==d2.day)&&(d1.month==d2.month)&&(d1.year==d2.year))
    printf("\nEQUAL");
    else
    printf("\nUNEQUAL");

    getch();
}
```

2.35 LAB8.Define a structure that can describe a hotel. It should have the member that includes the name, address, grade,room charge and number of rooms. Write a function to print out hotel of given grade in order of room charges.

```c
#include <stdio.h>

struct hotel
{
    char name[40];
    char add[40];
    int grade;
    int arc;
    int rooms;
};

void output();
void out();

struct hotel inn[]={
                {"Chandan Hotels","Rajendra Nagar",3,4500,50},
                {"Taluja Hotels","Gurgaon",4,5000,100},
                {"TJ hotels","Patiala",2,4000,50},
                {"Ankit Hotels","Rewari",5,6000,200},
                {"Amit Hotels","LIC",1,3500,150}
    };

int main()
{
    int go;
    printf("Enter 1 for grade search\n");
    printf("Enter 2 to search by charge:");
    scanf("%d",&go);
    switch(go)
    {
        case 1: output();
        break;

        case 2: out();
        break;

        default:printf("Wrong input");
        break;
    }
    return 0;
}


void output()
{
```

```
46      int gr,i;
47      printf("Enter Grade 1 to 5:");
48      scanf("%d",&gr);
49      if(gr>=1||gr<=5)
50      {
51          for(i=0;i<=4;i++)
52          {
53              if(inn[i].grade==gr)
54              printf("Hotel Name: %s\nAddress:%s\nGrade:%d\nAverage Room charge:%d\n\
55              Number of Rooms:%d",inn[i].name,inn[i].add,inn[i].grade,inn[i].arc,
56              inn[i].rooms);
57          }
58      }
59
60      else
61      printf("Wrong grade input!");
62      }
63
64
65  void out()
66  {
67      int ch,i=0;
68      printf("Enter the Room charges not greater than 6000:");
69      scanf("%d",&ch);
70      while(i<5)
71      {
72          if(inn[i].arc<ch)
73          printf("Hotel Name: %s\nAddress:%s\nGrade:%d\nAverage Room charge:%d\n\
74          Number of Rooms:%d\n",inn[i].name,inn[i].add,inn[i].grade,inn[i].arc,
75          inn[i].rooms);
76          i++;
77      }
78  }
```

2.36 LAB8.Define a structure called cricket with player name, team name, batting average, for 50 players and 5 teams. Print team wise list contains names of player with their batting average.

```c
#include <stdio.h>
#include <string.h>

struct cricket
{
    char player_name[20];
    char team_name[20];
    float batting_avg;
}p[50],t;

int main(void)
{
    int i=0,j=0,n=50;

    for(i=0;i<n;i++)
    {
        printf("\n Enter Player Name : ");
        scanf("%s",p[i].player_name);
        printf("\n Enter Team Name : ");
        scanf("%s",p[i].team_name);
        printf("\n Enter Batting Average : ");
        scanf("%f",&p[i].batting_avg);
    }

    for(i=0;i<n-1;i++)
    {
        for(j=i;j<n;j++)
        {

        if(strcmp(p[i].team_name,p[j].team_name)>0)
        {
            t=p[i];
            p[i]=p[j];
            p[j]=t;
        }

        }

    }

    j=0;
    for(i=0;i<n;i++)
    {
        if(strcmp(p[i].team_name,p[j].team_name)!=0 || i==0)
        {
            printf("\n Team Name: %s",p[i].team_name);
```

```
47              j=i;
48          }
49          printf("\n Player Name     = %s",p[i].player_name);
50          printf("\n Batting Average = %f",p[i].batting_avg);
51      }
52      return 0;
53  }
```

2.37 LAB9.Write a c program to copy and count the character content of one file says a.txt to another file b.txt

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

int main()
{
    FILE *fptr1, *fptr2;
    char filename[100], c;

    printf("Enter the filename to open for reading \n");
    scanf("%s", filename);

    // Open one file for reading
    fptr1 = fopen(filename, "r");
    if (fptr1 == NULL)
    {
        printf("Cannot open file %s \n", filename);
        exit(0);
    }

    printf("Enter the filename to open for writing \n");
    scanf("%s", filename);

    // Open another file for writing
    fptr2 = fopen(filename, "w");
    if (fptr2 == NULL)
    {
        printf("Cannot open file %s \n", filename);
        exit(0);
    }

    // Read contents from file
    c = fgetc(fptr1);
    while (c != EOF)
    {
        fputc(c, fptr2);
        c = fgetc(fptr1);
    }

    printf("\nContents copied to %s", filename);

    fclose(fptr1);
    fclose(fptr2);
    return 0;
}
```

2.38 LAB9.Write a program to take 10 integers from file and write square of these integer in other file.

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

int main ()
{

    FILE *fs, *ft;
    char ch, ch1;
    int x=0, x1=0;
    char path[100] = "./first.txt";
    char path1[100] = "./second.txt";
    fs = fopen(path, "r");
    ft = fopen(path1, "w");

    if (fs == NULL)
    {
        printf("Cannot open Source file");
        exit(1);
    }

    if (ft == NULL)
    {
        printf("Cannot open target file");
        exit(1);
    }

    while(1)
    {
        ch = fgetc(fs);

        if (ch==EOF) break;
        else
        {
            x = ch - '0';
            //printf("\n Value in integer %d", x);
            x1 = x*x ;
            //printf("\nSquare in integer %d", x1);
            ch1 = x1 + '0';
            //printf("\nSquare in character %c", ch1);
            fputc(ch1, ft);
        }
    }
    fclose(fs);
    fclose(ft);
    return 0;
}
```

2.39 LAB9.Write a program to read number from file and then write all 'odd' number to file ODD.txt and all even to file EVEN.txt

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

int main ()
{

    FILE *fs, *ft, *fp;
    char ch, ch1;
    int x=0, x1=0;
    char path[100] = "./first.txt";
    char path1[100] = "./odd.txt";
    char path2[100] = "./even.txt";
    fs = fopen(path, "r");
    ft = fopen(path1, "w");
    fp = fopen(path2, "w");

    if (fs == NULL)
    {
        printf("Cannot open Source file");
        exit(1);
    }
    if (ft == NULL)
    {
        printf("Cannot open target file");
        exit(1);
    }
    if (fp == NULL)
    {
        printf("Cannot open target file");
        exit(1);
    }

    while(1)
    {
        ch = fgetc(fs);

        if (ch==EOF) break;
        else
        {
            x = ch - '0';
            if(x%2==0)
            {
                ch1 = x + '0';
                fputc(ch1, fp);
            }
            else
            {
```

```
48                  ch1 = x + '0';
49                  fputc(ch1, ft);
50              }
51          }
52      }
53      fclose(fs);
54      fclose(ft);
55      return 0;
56  }
```

2.40 LAB9.Write a program to print all the prime number, between 1 to 100 in fileprime.txt.

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

int main ()
{

    FILE *ft;
    char ch, ch1;
    int Number = 0, count=0 ,i=0;
    char path1[100] = "./prime.txt";
    ft = fopen(path1, "w");
    if (ft == NULL)
    {
        printf("Cannot open target file");
        exit(1);
    }

    while(1)
    {
        ch = fgetc(ft);

        if (ch==EOF) break;
        else
        {
            for(Number = 1; Number <= 100; Number++)
            {
            count = 0;
                for (i = 2; i <= Number/2; i++)
                    {
                    if(Number%i == 0)
                        {
                            count++;
                            break;
                        }
                    }
                if(count == 0 && Number != 1 )
                {
                    ch1 = Number + '0';
                    fputc(ch1, ft);
                    }
            }
        }
    }
    fclose(ft);
    return 0;
}
```

2.41 LAB9.Write the following C program using pointer: a) To sort the list of numbers through pointer b) To reverse the string through pointer.

```c
#include <stdio.h>
#include <conio.h>
#include <stdlib.h>
#include <string.h>

int main()
{
        int n,*p,i,j,temp;
        printf("How many numbers u want to Sort: ");
        scanf("%d",&n);

        p=(int *) malloc(sizeof(int));

        if(p==NULL)
        {
                printf("\nMemory Allocation unsuccessful.\n");
                exit(0);
        }
        for(i=0;i<n;i++)
        {
                printf("\nEnter Number %d : ",i+1);
                scanf("%d",p+i);
        }
        for(i=0;i<n;i++)
        {
                for(j=0;j<n;j++)
                {
                        if(*(p+i)<*(p+j))
                        {
                                temp=*(p+i);
                                *(p+i)=*(p+j);
                                *(p+j)=temp;
                        }
                }
        }
        printf("\nThe Sorted Numbers are :\n");
        for(i=0;i<n;i++)
            {
                printf(" %d ",*(p+i));
            }



        char str[200] = "Solutions of Programming for Problem Solving";
        printf("\n\nEnter a string: %s\n", str);
        reverseString(str);
        printf("Reverse of the string: %s\n", str);
```

```
48      return 0;
49  }
50
51  void reverseString(char* str)
52  {
53          int l, i;
54          char *begin_ptr, *end_ptr, ch;
55          l = strlen(str);
56          begin_ptr = str;
57          end_ptr = str;
58          for (i = 0; i < l - 1; i++)
59                  end_ptr++;
60          for (i = 0; i < l / 2; i++)
61          {
62          ch = *end_ptr;
63                  *end_ptr = *begin_ptr;
64                  *begin_ptr = ch;
65                  begin_ptr++;
66                  end_ptr--;
67          }
68  }
```

2.42 LAB10.Write a program to find the largest no among 20 integers array using dynamic memory allocation.

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

int main() {
  int num;
  double *data;
  printf("Enter the total number of elements: ");
  scanf("%d", &num);


  data = (double *)calloc(num, sizeof(double));
  if (data == NULL) {
    printf("Error!!! memory not allocated.");
    exit(0);
  }

  for (int i = 0; i < num; ++i) {
    printf("Enter number%d: ", i + 1);
    scanf("%lf", data + i);
  }

  for (int i = 1; i < num; ++i) {
    if (*data < *(data + i))
      *data = *(data + i);
  }
  printf("Largest number = %.2lf", *data);

  free(data);

  return 0;
}
```

2.43 LAB10.Using Dynamic Memory Allocation, Write a program to find the transpose of given matrix.

```c
#include<stdio.h>
#include<stdlib.h>
int main()
{
        int *transpose,i,j,r,c;
        printf("\n How many rows and columns in the matrix:- ");
        scanf(" %d %d",&r,&c);

        transpose=(int*)calloc(r*c,sizeof(int));
        printf("\n Enter the elements:- ");
        for(i=0;i<r;i++)
        for(j=0;j<c;j++)
        {
        scanf("%d",transpose+(i*c+j)*sizeof(int));
        }

        printf("\n The transpose of matrix is:- \n");
        for(i=0;i<c;i++)
        {
        for(j=0;j<r;j++)
                printf("%5d",*(transpose+(j*c+i)*sizeof(int)));
        printf("\n");
        }
        return 0;
}
```

2.44 LAB10.Write a program to find the factorial of given number using command line argument.

```c
#include <stdio.h>
#include <string.h>
int main(int argc, char *argv[])
{
    int num, fact;
    if(argc != 2) {
        printf("Invalid Usage.\n\n");
        printf("Usage: ./a.out <number>\n");
        return 0;
    }
    num = atoi(argv[1]);
    if(num<0) {
        printf("Error: Factorial of negative number doesn't exist.");
        return 1;
    }
    fact = 1;

    while(num>1)
    {
        fact = fact * num;
        num--;
    }
    printf("%d\n", fact);
    return 0;
}
```

2.45 LAB10.Write a program to find the sum of digits of a 5 digit number usingcommand line argument.

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

int main(int argc, char * argv[])
{
    long num, temp, digit, sum = 0;
    if(argc == 1 ||  argc > 2)
    {
         printf("Enter the number\n");
         exit(1);
    }
    num = atoi (argv[1]) ;
    temp = num;
    while (num > 0)
    {
        digit = num % 10;
        sum  = sum + digit;
        num /= 10;
    }
    printf("Sum of the digits of %ld = %ld\n", temp, sum);
}
```

End-Note

The author is thankful to everyone who is reading this book. Sincere thanks to my previous manager, Mr. Tapan Kapoor at Aviconn Solutions Pvt. Ltd., who pushed me enough to keep my learning spirit on a higher note.
The author is also thankful to Mr. Arshpreet Singh, SS Edutech for allowing the author to experiment with random stuff.

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