

# Bachelors of Science SEM I Journal

Roll No.	001
Name	Alston Alvares
Subject	Programming principles with C.



Saibaba Nagar, Borivali (West), Mumbai – 400 092

Tel.: 2807 7126

Email: adkdcollege@yahoo.com / www.adkdcollege.in

ISO 9001: 2008 Certified

## CERTIFICATE

This is here to certify that Mr/Ms. Alston Alvares, Seat Number 001 of B.Sc. IT, has satisfactorily completed the required number of experiments prescribed by the **ANANDIBAI DAMODAR KALE DEGREE COLLEGE AFFILIATED TO UNIVERSITY OF MUMBAI** during the academic year 2022 - 2023.

Date: 30-09-2022

Place: Mumbai

Teacher In-Charge

Head of Department

External Examiner

# INDEX

Sr. No.	Experiments	Page No	Date	Sign
1	a. Write an algorithm and draw flowchart for Area of circle. b. Write an algorithm and draw flowchart to print the given no. is even or odd. c. Write an algorithm and draw flowchart to print 1 to 10 numbers. d. Write an algorithm and draw flowchart for sum of 1 to 5 numbers. e. Write an algorithm and draw flowchart to compute the addition of digits of a given number.	06-10		
2	a. Write a program using while loop to reverse the digits of a number. b. Write a program to calculate the factorial of a given number. c. Write a program to find the roots of quadratic equation. d. Write a program to print the Fibonacci series.	11-17		
3	a. Write a program in C to check entered character vowel or consonant b. Write a program to C program to print day name of week using switch-case. c. Write a program to read three values from keyboard and print out the largest of them without using if statement.	18-22		

4	<p>a. Write a program to print the pattern of asterisks as shown below:</p> <pre>* * * * * * * * * *</pre> <p>b. Write a program to print the pattern of asterisks as shown below:</p> <pre>* * * * * * * * * * * * * * * * * * *</pre> <p>c. Write a program to print Floyd's Triangle.</p>	23-26		
5	<p>a. Write a program to print area of square using function.</p> <p>b. Write a program using recursive function.</p> <p>c. Write a program to square root, abs() value using function.</p> <p>d. Write a program using goto statement.</p>	27-31		
6	<p>a. Write a program to print rollno and names of 10 students using array.</p> <p>b. Write a program to read a matrix of size m*n.</p> <p>c. Write a program to sort the elements of array in ascending or descending order.</p>	32-38		

<b>7</b>	<p>a. Write a program to extract the portion of a character string and print the extracted part.</p> <p>b. Write a program to find the given string is palindrome or not.</p> <p>c. Write a program to using strlen(), strcmp() function.</p>	<b>39-42</b>		
<b>8</b>	<p>a. Write a program to display the values using different data types and its address using pointer.</p> <p>b. Write a program to perform addition and subtraction using pointer.</p>	<b>43-46</b>		
<b>9</b>	<p>a. Write a program to copy the contents of the file from one file into other.</p> <p>b. Write a program to print the structure using • Title • Author • Subject • Book ID Print the details of two students.</p>	<b>47-51</b>		
<b>10</b>	<p>a. Create a mini project on "Bank management system". The program should be menu driven.</p>	<b>52-56</b>		

**Experiment no – 01(6)**

**Aim:** Write an algorithm and draw flowchart for Area of circle.

**Algorithm:**

Step 1: Start

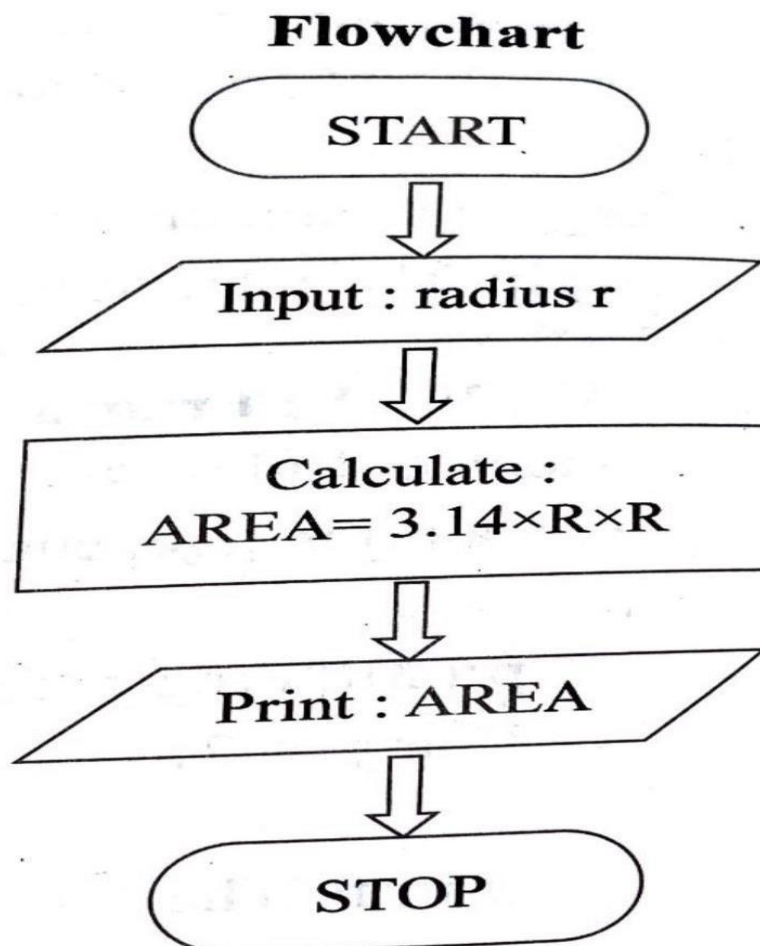
Step 2: Read the circle's radius R value.

Step 3: Calculate area of circle i.e.  $AREA = 3.14 \times R \times R$

Step 4: Print AREA

Step 5: Stop

**Flowchart:**

**Experiment no – 01(b)**

**Aim:** Write an algorithm and draw flowchart to print the given no. is even or odd.

**Algorithm:**

Step 1: Start

Step 2: Read the number value NUM.

Step 3: Divide the NUM by 2 and store the remainder in REM

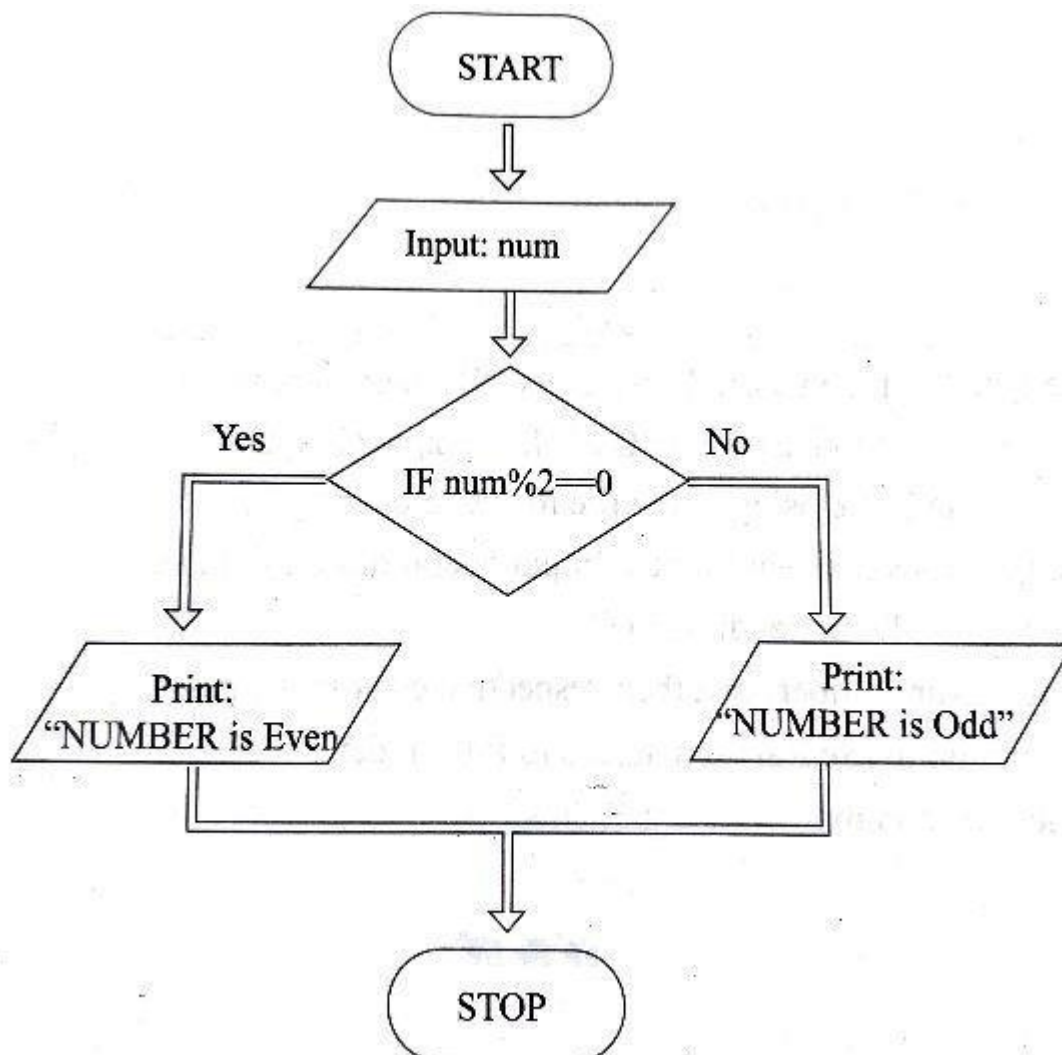
Step 4: If REM = 0 Then go to Step 6

Step 5: Print "NUMBER is Odd" go to step 7

Step 6: Print "NUMBER is Even"

Step 7: Stop

**Flowchart:**



**Aim:** Write an algorithm and draw flowchart to print 1 to 10 numbers.

**Algorithm:**

Step 1: Start

Step 2: Initialize the variable NUM = 1

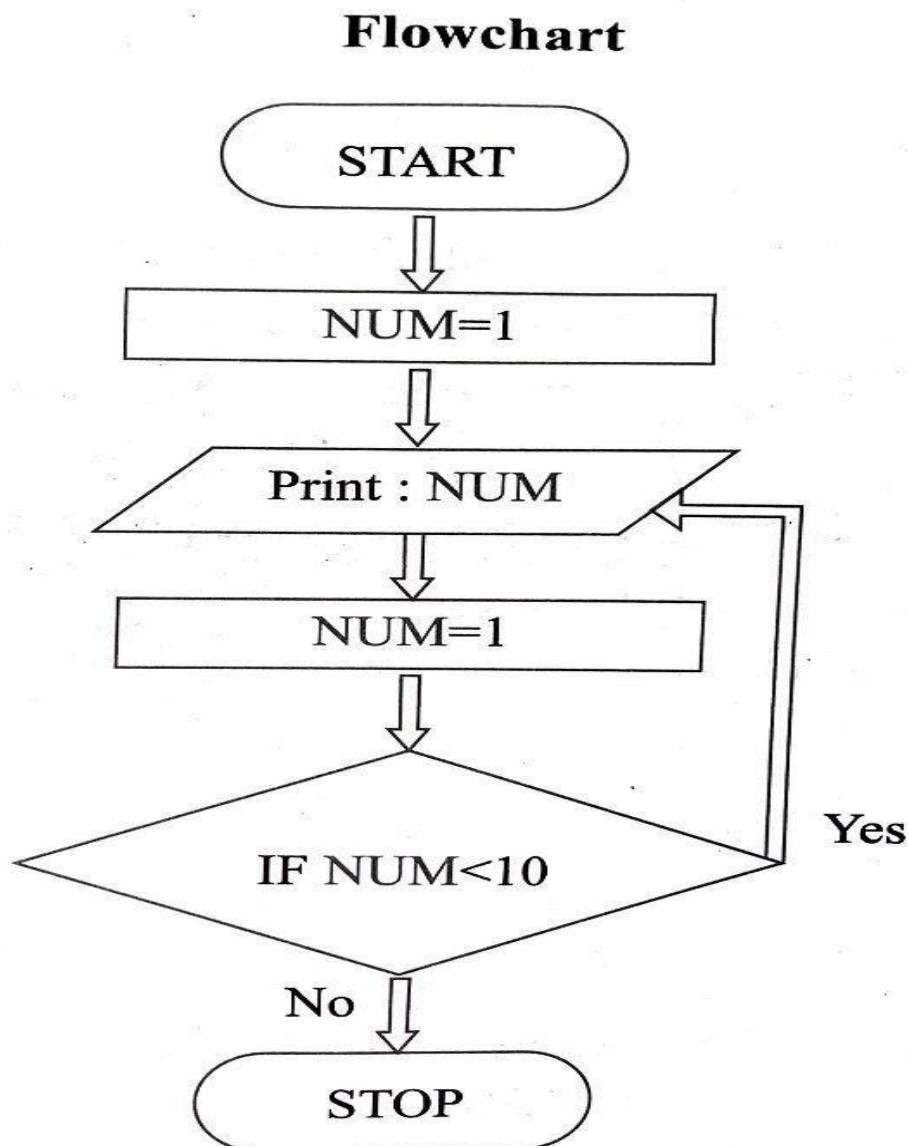
Step 3: Print NUM

Step 4: Increment NUM by 1 NUM=NUM+1

Step 5: If NUM<= 10 go to Step 3

Step 6: Stop

**Flowchart:**



**Aim:** Write an algorithm and draw flowchart for sum of 1 to 5 numbers.



**Algorithm:**

Step 1: Start

Step 2: Initialize the variable NUM = 1 and SUM=0

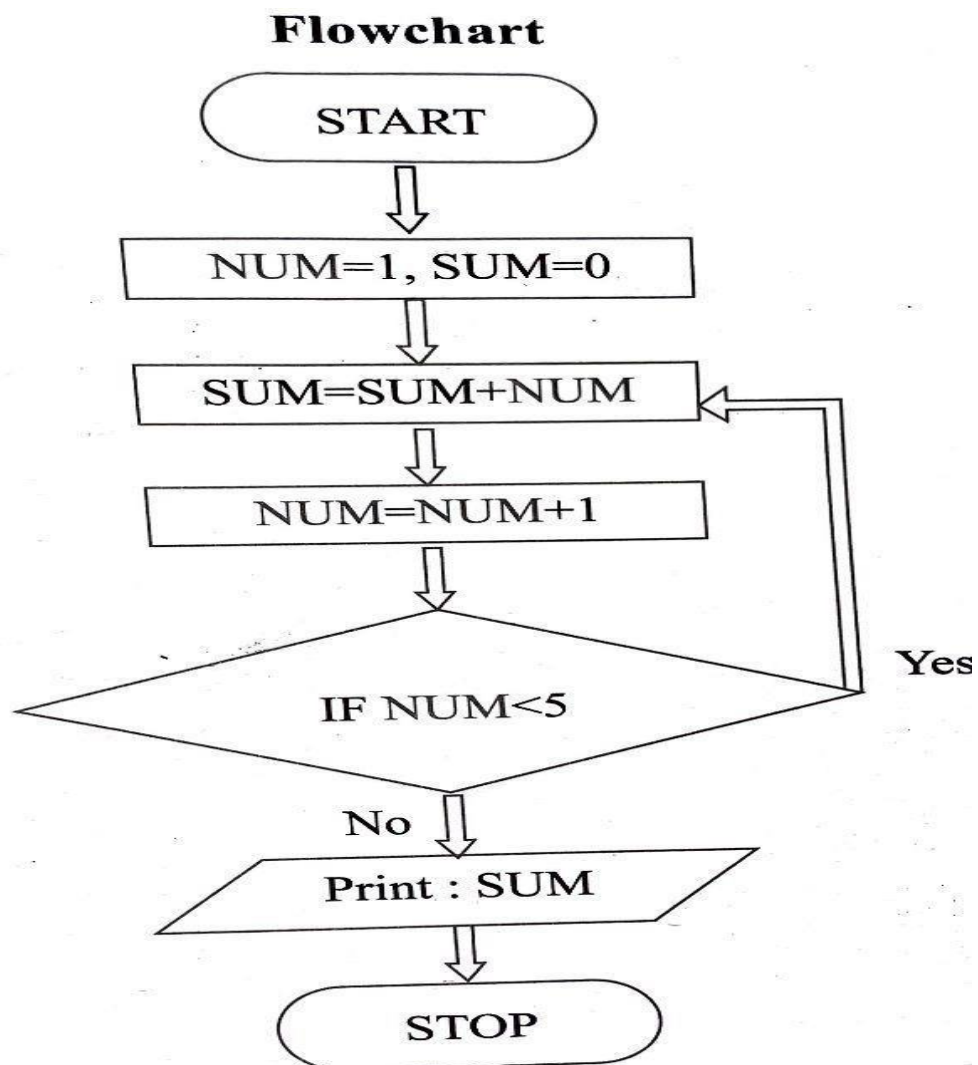
Step 3: SUM=SUM+NUM

Step 4: Increment NUM by 1 NUM=NUM+1

Step 5: If NUM<=5 go to Step 3

Step 6: Print SUM

Step 7: Stop

**Flowchart:**

Experiment no – 01(d)

**Aim:** Write an algorithm and draw flow chart to compute the addition of digits of a given number.

**Algorithm:**

Step 1: Start

Step 2: Read the number value NUM

Step 3: Initialize SUM = 0

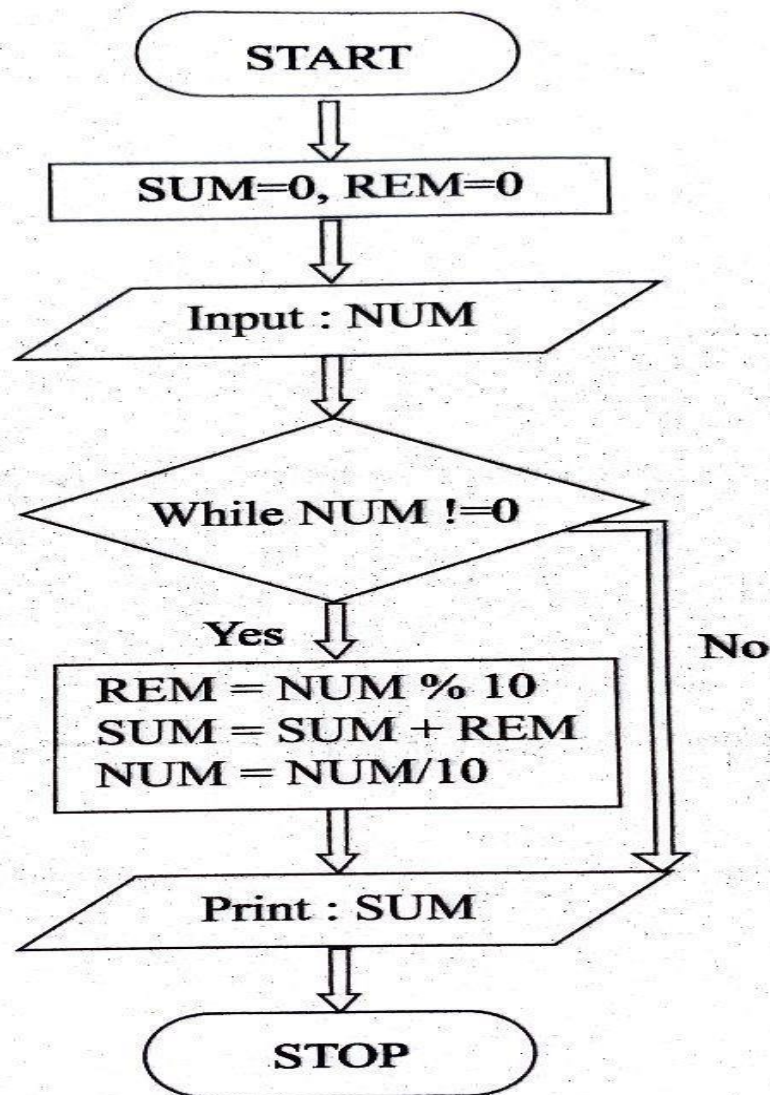
Step 4: Perform  $REM = NUM \% 10$  and add REM to SUM i.e.  $SUM = SUM + REM$

Step 5: Perform  $NUM = NUM/10$

Step 6: IF NUM = 0 stop the process and Print SUM else go to Step 3

Step 7: Stop

**Flowchart:**



**Experiment no – 02(a)**

**Aim: Write a program using while loop to reverse the digits of a number.**

**Algorithm:**

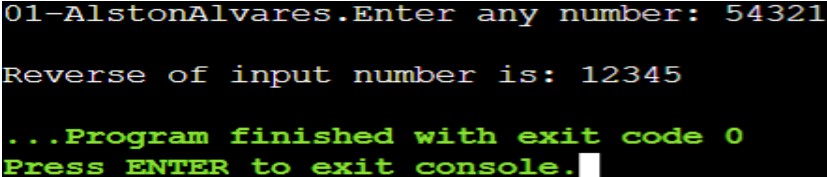
- i. Ask the user to enter any number.
- ii. Declare and initialize another variable reversed with 0, where reversed an integer variable.
- iii. Get the last digit of the given number by performing the modulo division (%) and store the value in last\_digit variable, likey last\_digit= number % 10.
- iv. Multiply reversed by 10 and add last\_digit, like reversed = reversed\*10 + last\_digit.
- v. Divide numbered by 10, like numbered/10.
- vi. Repeat the steps 3 to 5 till numbered is not equal to (or greater than) zero.

**Code:**

```
#include <stdio.h>

int main()
{ printf("01-AlstonAlvares.");
  int num, rnum = 0, rem;
  printf("Enter any number: ");
  scanf("%d", &num);
  while (num != 0) {
    rem = num % 10;
    rnum = rnum * 10 + rem;
    num = num / 10;
  }
  printf("\nReverse of input number is: %d", rnum);
  return 0;}
```

**Output:**



```
01-AlstonAlvares.Enter any number: 54321
Reverse of input number is: 12345
...Program finished with exit code 0
Press ENTER to exit console. █
```

**Experiment no – 02(b)**

**Aim: Write a program to calculate the factorial of a given number.**

**Algorithm:**

- i. Start program
- ii. Ask the user to enter an integer to find the factorial
- iii. Read the integer and assign it to a variable
- iv. From the value of the integer up to 1, multiply each digit and update the final value
- v. The final value at the end of all the multiplication till 1 is the factorial
- vi. End program

**Code:**

```
#include <stdio.h>

int main() {
    {
        printf("01-AlstonAlvares.");}
    int n, i;
    unsigned long long fact = 1;
    printf("Enter an integer: ");
    scanf("%d", &n);
    // shows error if the user enters a negative integer
    if (n < 0)
        printf("Error! Factorial of a negative number doesn't exist.");
    else {
        for (i = 1; i <= n; ++i) {
            fact *= i;
        }
        printf("Factorial of %d = %llu", n, fact);
    }
}
```

```
    return 0;  
}
```

**Output:**

```
01-AlstonAlvares.Enter an integer: 10  
Factorial of 10 = 3628800  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

**Experiment no – 02(c)**

**Aim:** Write a program to find the roots of quadratic equation.

**Algorithm:**

- i. Start
- ii. Read a, b, c values
- iii. Compute  $d = b^2 - 4ac$
- iv. if  $d > 0$  then
  - i.  $r1 = \frac{-b + \sqrt{d}}{2a}$
  - ii.  $r2 = \frac{-b - \sqrt{d}}{2a}$
- v. Otherwise if  $d = 0$  then
  - i. compute  $r1 = -b/2a$ ,  $r2 = -b/2a$
  - ii. print r1,r2 values
- vi. Otherwise if  $d < 0$  then print roots are imaginary
- vii. Stop

**Code:**

```
#include<stdio.h>  
  
#include<math.h>  
  
int main()
```

```
{  
    printf("01-AlstonAlvares.");  
    float a,b,c,x1,x2,determinant,realpart,imaginaryPart;  
    printf("Enter coefficients a,b and c:");  
    scanf("%f%f%f",&a,&b,&c);  
    determinant=b*b - 4*a*c;  
    if (determinant>0)  
    {  
        x1=(-b + sqrt(determinant))/(2*a);  
        x2=(-b - sqrt(determinant))/(2*a);  
        printf("Roots are real and different.");  
        printf("\n x1=%.3f",x1);  
        printf("\n x2=%.3f",x2);  
    }  
    else if (determinant==0)  
    {  
        printf("Roots are real and same.");  
        x1=(-b+sqrt(determinant))/(2*a);  
        printf("\n x1=%.ef",x1);  
        printf("\nx2=%.3f",x2);  
    }  
    Else  
    {  
        realpart=-b/(2*a);  
        imaginaryPart=sqrt(determinant)/(2*a);  
        printf("\n Roots are complex and differtent.");  
        printf("\n x1=%.3f+%.fi",realpart,imaginaryPart);  
        printf("\nx2 = %.3f-%3fi",realpart,imaginaryPart);  
    }  
    return 0;
```

```
}
```

**Output:**

```
01-AlstonAlvares.Enter coefficients a,b and c:4 5 1
Roots are real and different.
x1=-0.250
x2=-1.000

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 02(d)****Aim: Write a program to print the Fibonacci series.****Algorithm:**

- i. START
- ii. Take integer variable A, B, C
- iii. Set A = 0, B = 0
- iv. DISPLAY A, B
- v. C = A + B
- vi. DISPLAY C
- vii. Set A = B, B = C
- viii. REPEAT from 4 - 6, for n times
- ix. STOP

**Code:**

```
#include <stdio.h>

int main() {
    printf("01-AlstonAlvares.");

    int i, n;

    // initialize first and second terms
    int t1 = 0, t2 = 1;

    // initialize the next term (3rd term)
    int nextTerm = t1 + t2;

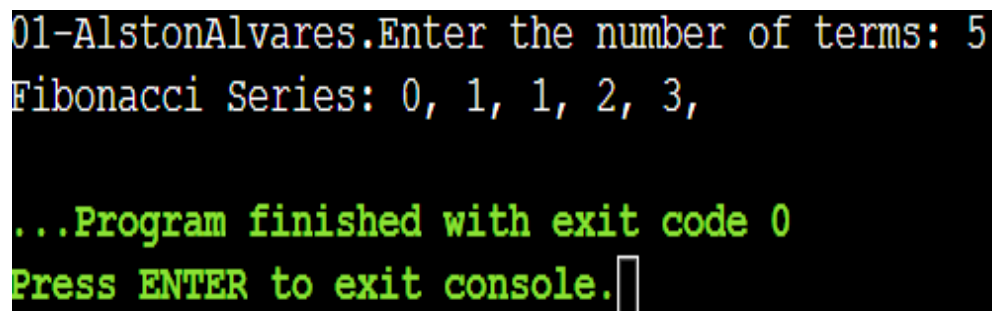
    // get no. of terms from user
    printf("Enter the number of terms: ");
    scanf("%d", &n);

    // print the first two terms t1 and t2
    printf("Fibonacci Series: %d, %d, ", t1, t2);

    // print 3rd to nth terms
```



```
for (i = 3; i <= n; ++i) {  
    printf("%d, ", nextTerm);  
    t1 = t2;  
    t2 = nextTerm;  
    nextTerm = t1 + t2;  
}  
return 0;  
}
```

**Output:**

```
01-AlstonAlvares.Enter the number of terms: 5  
Fibonacci Series: 0, 1, 1, 2, 3,  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

**Experiment no – 03(a)****Aim: Write a program in C to check entered character vowel or consonant.****Algorithm:**

- i. Start
- ii. Declare character type variable ch
- iii. Read ch from User
- iv. // Checking both lower and upper case vowels.
- v. IF (ch == 'a' || ch == 'A' ||
  - i. ch == 'e' || ch == 'E' ||
  - ii. ch == 'i' || ch == 'I' ||
  - iii. ch == 'o' || ch == 'O' ||
  - iv. ch == 'u' || ch == 'U' )
- vi. Print "Vowel"
- vii. ELSE
- viii. Print "Consonant"
- ix. Stop

**Code:**

```
#include <stdio.h>

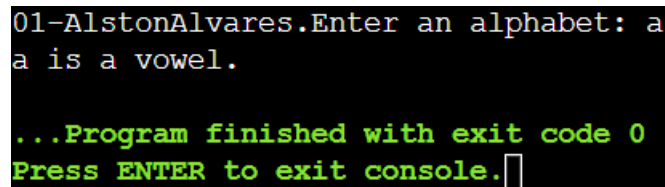
int main() {
    char c;
    printf("01-AlstonAlvares.");
    int lowercase_vowel, uppercase_vowel;
    printf("Enter an alphabet: ");
    scanf("%c", &c);

    // evaluates to 1 if variable c is a lowercase vowel
    lowercase_vowel = (c == 'a' || c == 'e' || c == 'i' || c == 'o' || c == 'u');

    // evaluates to 1 if variable c is a uppercase vowel
    uppercase_vowel = (c == 'A' || c == 'E' || c == 'I' || c == 'O' || c == 'U');

    // evaluates to 1 (true) if c is a vowel
    if (lowercase_vowel || uppercase_vowel)
```

```
    printf("%c is a vowel.", c);  
else  
    printf("%c is a consonant.", c);  
return 0;  
}
```

**Output:**

```
01-AlstonAlvares.Enter an alphabet: a  
a is a vowel.  
...Program finished with exit code 0  
Press ENTER to exit console.
```

**Experiment no – 03(b)**

**Aim:** Write a program to C program to print day name of week using switch-case.

**Algorithm:**

- i. Input day number from user. Store it in some variable say *no*.
- ii. Switch the value of *week* i.e. use switch(*no*) and match with cases.
- iii. There can be 7 possible values(choices) of *week* i.e. 1 to 7. Therefore write 7 case inside switch. In addition, add default case as an else block.
- iv. For case 1: print “MONDAY”, for case 2: print “TUESDAY” and so on. Print “SUNDAY” for case 7:.
- v. If any case does not matches then, for default: case print “Invalid week number”.

**Code:**

```
#include <stdio.h>  
  
int main()  
{ printf("01-AlstonAlvares.");  
    int week;  
  
    /* Input week number from user */  
    printf("Enter week number(1-7): ");
```

```
scanf("%d", &week);

switch(week)
{
    case 1:
        printf("Monday");
        break;
    case 2:
        printf("Tuesday");
        break;
    case 3:
        printf("Wednesday");
        break;
    case 4:
        printf("Thursday");
        break;
    case 5:
        printf("Friday");
        break;
    case 6:
        printf("Saturday");
        break;
    case 7:
        printf("Sunday");
        break;
    default:
        printf("Invalid input! Please enter week number between 1-7.");
}

return 0;
```

```
}
```

**Output:**

```
01-AlstonAlvares.Enter week number(1-7): 5
Friday

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 03(c)**

**Aim:** Write a program to read three values from keyboard and print out the largest of them without using if statement.

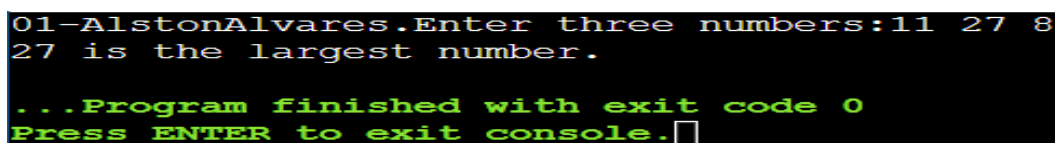
**Algorithm:**

- i. Ask the user to enter three integer values.
- ii. Read the three integer values in num1, num2, and num3 (integer variables).
- iii. Check if num1 is greater than num2.
- iv. If true, then check if num1 is greater than num3.
  - a. If true, then print 'num1' as the greatest number.
  - b. If false, then print 'num3' as the greatest number.
- v. If false, then check if num2 is greater than num3.
  - a. If true, then print 'num2' as the greatest number.
  - b. If false, then print 'num3' as the greatest number.

**Code:**

```
#include<stdio.h>

int main()
{ printf("01-AlstonAlvares.");
  int N1, N2, N3, Irg;
  printf("Enter three numbers:");
  scanf("%d %d %d", &N1, &N2, &N3);
  Irg = N1 > N2 ? (N1 > N3 ? N1 : N3) : (N2 > N3 ? N2 : N3);
  printf("%d is the largest number.",Irg);
  return 0;
}
```

**Output:**A screenshot of a terminal window showing the output of the program. The first line shows the prompt '01-AlstonAlvares.Enter three numbers:' followed by the input '11 27 8'. The second line shows the output '27 is the largest number.'. The third line shows the message '...Program finished with exit code 0'. The fourth line shows the prompt 'Press ENTER to exit console.' followed by a small square icon.

```
01-AlstonAlvares.Enter three numbers:11 27 8
27 is the largest number.
...Program finished with exit code 0
Press ENTER to exit console.□
```

**Experiment no – 04(a)**

**Aim: a. Write a program to print the pattern of asterisks as shown below :**

```
*  
  
* *  
  
* * *  
  
* * * *
```

**Algorithm:**

- i. Display \* and go to new line
- ii. Display \* \* and go to new line.
- iii. Display \* \* \* and go to new line.
- iv. Display \* \* \* \*

**Code:**

```
#include<stdio.h>  
  
int main()  
{ printf("01-AlstonAlvares.\n");  
  int i, j, n;  
  /* for used as row wise */  
  for(i=1; j<=4; ++i)  
  {  
    /* for used as column wise */  
    for(j=1; j<=i; ++j)  
    {  
      printf("*"); } printf("\n");  
    }  
  return 0;}
```

**Output:**

```
01-AlstonAlvares.  
*  
* *  
* * *  
* * * *  
  
...Program finished with exit code 0  
Press ENTER to exit console. □
```

**Experiment no – 04(b)**

**Aim:** Write a program to print the pattern of asterisks as shown below :

\* \* \* \* \*

\* \* \* \*

\* \* \*

\* \*

\*

**Algorithm:**

- i. Display \*\*\*\*\* and go to new line
- ii. Display \* \* \* \* and go to new line.
- iii. Display \* \* \* and go to new line.
- iv. Display \* \* and go to new line.
- v. Display \*

**Code:**

```
#include<stdio.h>

int main()
{ printf("01-AlstonAlvares.\n");
  int i, j;
  /* for used as row wise */
  for(i=5; i>=1; i--)
  {
    /* for used as column wise */
    for(j=1; j<=i; j++)
    {
      printf("*");
    }
    printf("\n");
  }
  return 0; }
```



**Output:**

```
Output:
01-AlstonAlvares.
*****
*****
****
***
**
*
```

**Experiment no – 04(c)**

**Aim:** Write a program to print Floyd's Triangle.

**Algorithm:**

- i. Create variables that hold rows and column values as i and j. Take a number to display the rows as num and set the variable k to 1 as its initial value.
  - ii. Use nested for loops:
    - a. Outer for loop starts its iteration i = 1 up to n rows.
    - b. Inner for loop starts its iteration from j = 1 up to (j <=i).
  - iii. Print the values of k.
  - iv. Increment k by 1 or k = k + 1.
- v. Jump to newline after each iteration of the inner for loop.
  - vi. Stop

**Code:**

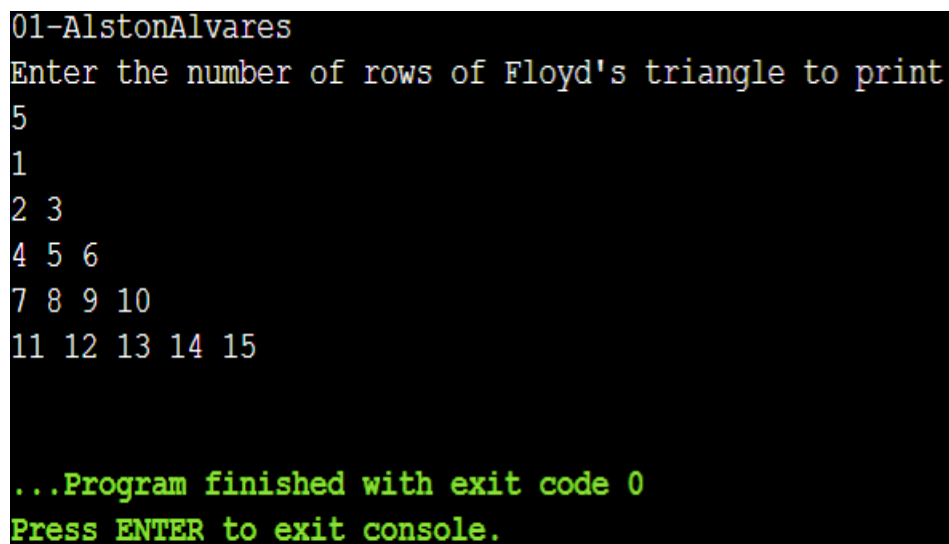
```
#include <stdio.h>

int main()
{ printf("01-AlstonAlvares\n");

  int n, i, c, a = 1;

  printf("Enter the number of rows of Floyd's triangle to print\n");
  scanf("%d", &n);
```

```
for (i = 1; i <= n; i++)  
{  
    for (c = 1; c <= i; c++)  
    {  
        printf("%d ", a); // Please note space after %d  
        a++;  
    }  
    printf("\n");  
}  
return 0;  
}
```

**Output:**

```
01-AlstonAlvares  
Enter the number of rows of Floyd's triangle to print  
5  
1  
2 3  
4 5 6  
7 8 9 10  
11 12 13 14 15  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

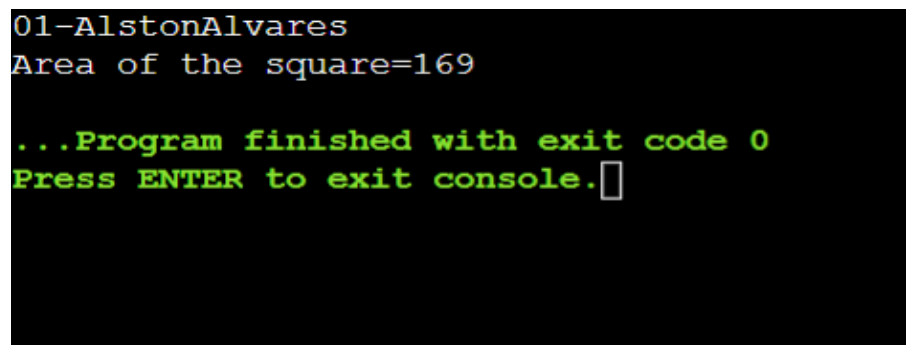
**Experiment no – 05(a)****Aim: Write a program to print area of square using function.****Algorithm:**

- i. Start.
- ii. Declare at s as integer.
- iii. Initialize value of s.
- iv. Calculate at  $s \times s$ .
- v. print area of triangle .
- vi. End.

**Code:**

```
#include <stdio.h>

int main()
{ printf("01-AlstonAlvares\n");
  int s=13;
  int area_square=s*s;
  printf("Area of the square=%d",area_square);
}
```

**Output:**

```
01-AlstonAlvares
Area of the square=169

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 05(b)****Aim: Write a program using recursive function.****Algorithm:**

- i. Start.
- ii. Read the Input.
- iii. Perform recursion.
- iv. Print result.
- v. Stop.

**Code:**

```
#include <stdio.h>

int sum(int n);

int main() { printf("01-AlstonAlvares.\n");

    int number, result;

    printf("Enter a positive integer: ");
    scanf("%d", &number);
    result = sum(number);
    printf("sum = %d", result);
    return 0;
}

int sum(int n) {
    if (n != 0)
        // sum() function calls itself
        return n + sum(n-1);
    else
        return n;
}
```

**Output:**

```
01-AlstonAlvares.  
Enter a positive integer: 3  
sum = 6  
  
...Program finished with exit code 0  
Press ENTER to exit console.□
```

**Experiment no – 05(c)**

**Aim:** Write a program to square root, abs() value using function.

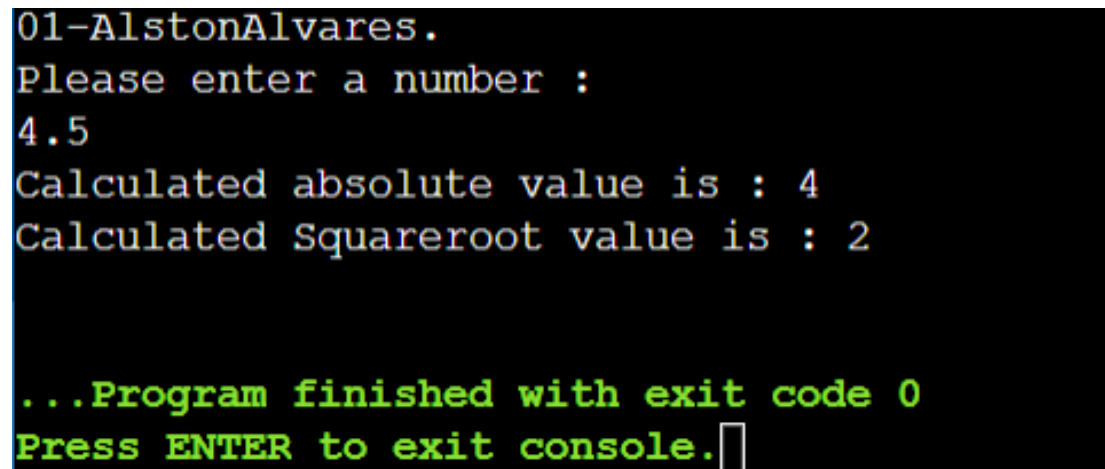
**Algorithm:**

- i. Start
- ii. Read the input
- iii. Calculate absolute value
- iv. Calculate square root value
- v. Print results
- vi. Stop

**Code:**

```
#include<stdio.h>  
#include<math.h>  
  
int main()  
{ printf("01-AlstonAlvares.\n");  
  
  int num, a;  
  
  printf("Please enter a number :.\n");  
  scanf("%d",&num);  
  
  a = abs(num);  
  
  printf("Calculated absolute value is : %d\n", a);  
  
  a = sqrt(num);  
  
  printf("Calculated Squareroot value is : %d\n",a);  
}
```

```
    return 0;
}
```

**Output:**

```
01-AlstonAlvares.
Please enter a number :
4.5
Calculated absolute value is : 4
Calculated Squareroot value is : 2

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 05(d)**

**Aim:** Write a program using go to statement.

**Algorithm:**

- i. Start
- ii. Read the Input
- iii. Check if the input is inside loop or outside loop
- iv. Print result
- v. Stop

**Code:**

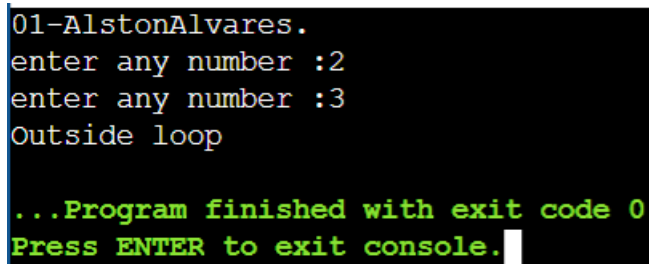
```
#include<stdio.h>

int main()
{ printf("01-AlstonAlvares.\n");

    int n;

    for(;;)    /*ifinite loop*/
    {
        printf("enter any number :");
        scanf("%d",&n);
        if(n == 5)
            goto ap;    /* use of goto statement*/
        if (n% 2 == 0)
            continue; /*use of continue statement*/
```

```
if (n% 3 == 0)
break; /*use of break state*/
printf("Inside loop");
}
ap:
printf("Outside loop");
return 0;
}
```

**Output:**A screenshot of a terminal window with a black background and white and green text. The text shows the program's execution: a prompt '01-AlstonAlvares.', two input prompts 'enter any number :2' and 'enter any number :3', the output 'Outside loop', and a green message '...Program finished with exit code 0' followed by 'Press ENTER to exit console.' with a white cursor.

```
01-AlstonAlvares.
enter any number :2
enter any number :3
Outside loop

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 06(a)****Aim: a. Write a program to print rollno and names of 10 students using array.****Algorithm:**

- i. Start
- ii. Store Student Information
- iii. Create the student's structure variable
- iv. Display information
- v. Stop

**Code:**

```
// C Program to Store Information
// of Students Using Structure
#include <stdio.h>
#include <stdlib.h>
#include <string.h>
// Create the student structure
struct Student {
    char* name;
    int roll_number;
};
// Driver code
int main()
{ printf("01-AlstonAlvares\n");
    int i = 0, n = 10;
    // Create the student's structure variable
    // with n Student's records
    struct Student student[n];
    // Get the students data
    student[0].roll_number = 1;
    student[0].name = "Geeks16";
    student[1].roll_number = 2;
    student[1].name = "Geeks54";
    student[2].roll_number = 3;
```



```
    student[2].name = "Geeks22";
    student[3].roll_number = 4;
    student[3].name = "Geeks41";
    student[4].roll_number = 5;
    student[4].name = "Geeks39";
    student[5].roll_number = 6;
    student[5].name = "Geeks3";
    student[6].roll_number = 7;
    student[6].name = "Geeks32";
    student[7].roll_number = 8;
    student[7].name = "Geeks36";
    student[8].roll_number = 9;
    student[8].name = "Geeks35";
    student[9].roll_number = 10;
    student[9].name = "Geeks34";
    // Print the Students information
    printf("Student Records:\n\n");
    for (i = 0; i < n; i++) {
        printf("\tName = %s\n", student[i].name);
        printf("\tRoll Number = %d\n", student[i].roll_number);
    }
    return 0;
}
```

**Output:**

```
01-AlstonAlvares
Student Records:

    Name = Geeks16
    Roll Number = 1
    Name = Geeks54
    Roll Number = 2
    Name = Geeks22
    Roll Number = 3
    Name = Geeks41
    Roll Number = 4
    Name = Geeks39
    Roll Number = 5
    Name = Geeks31
    Roll Number = 6
    Name = Geeks32
    Roll Number = 7
    Name = Geeks36
    Roll Number = 8
    Name = Geeks35
    Roll Number = 9
    Name = Geeks34
    Roll Number = 10

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 06(b)**

**Aim:** Write a program to read a matrix of size m\*n.

**Algorithm:**

- i. Start
- ii. Enter row and column size
- iii. Construct Matrix
- iv. Display result
- v. Stop

**Code:**

```
#include<stdio.h>

int main()
```

```
{ printf("01-AlstonAlvares.\n");  
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:**

```
01-AlstonAlvares.  
Enter row and column size:  
2 2  
Enter matrix elements:  
a[0][0]=12  
a[0][1]=23  
a[1][0]=45  
a[1][1]=56  
Matrix read is:  
12.000000      23.000000  
45.000000      56.000000  
  
...Program finished with exit code 0  
Press ENTER to exit console.
```

**Experiment no – 06(c)**

**Aim:** Write a program to sort the elements of array in ascending or descending order.

**Algorithm:**

- i. Start.
- ii. Input size of array.
- iii. Place currently selected element array to its correct place.
- iv. Swap if currently selected array element to its correct place.
- v. Print the sorted array.
- vi. Stop.

**Code:**

```
/**  
  
 * C program to sort elements of array in ascending order  
  
 */  
  
#include <stdio.h>  
  
#define MAX_SIZE 100 // Maximum array size  
  
int main()  
{ printf("01-AlstonAlvares\n");  
    int arr[MAX_SIZE];  
    int size;  
    int i, j, temp;  
    /* Input size of array */  
    printf("Enter size of array: ");  
    scanf("%d", &size);  
    /* Input elements in array */  
    printf("Enter elements in array: ");  
    for(i=0; i<size; i++)  
    {  
        scanf("%d", &arr[i]);  
    }  
  
    for(i=0; i<size; i++)  
    {
```

```
/*  
    * Place currently selected element array[i]  
    * to its correct place.  
    */  
for(j=i+1; j<size; j++)  
{  
    /*  
        * Swap if currently selected array element  
        * is not at its correct position.  
        */  
    if(arr[i] > arr[j])  
    {  
        temp    = arr[i];  
        arr[i] = arr[j];  
        arr[j] = temp;  
    }  
}  
}  
/* Print the sorted array */  
printf("\nElements of array in ascending order: ");  
for(i=0; i<size; i++)  
{  
    printf("%d\t", arr[i]);  
}  
return 0;  
}
```

**Output:**

```
01-AlstonAlvares
```

```
Enter size of array: 5
```

```
Enter elements in array: 27 11 34 56 13
```

```
Elements of array in ascending order: 11      13      27      34      56
```

```
...Program finished with exit code 0
```

```
Press ENTER to exit console. |
```

**Experiment no – 07(a)**

**Aim:** Write a program to extract the portion of a character string and print the extracted part.

**Algorithm:**

- i. Start
- ii. Enter index start
- iii. Enter index last
- iv. Print result
- v. Stop

**Code:**

```
#include<stdio.h>
#include<conio.h>
#include<string.h>
void demo(char*s,int start,int end)
{
    int i;
    for(i=start;i<=end;i++)
        printf("%c",s[i]);
}
int main()
{ printf("01-AlstonAlvares\n");
  char str[100]="NAVI MUMBAI";
  int s,e;
  printf("Enter the Start Index:");
  scanf("%d",&s);
  printf("Enter the Last Index:");
  scanf("%d",&e);
  if(e>strlen(str) ||(s>strlen(str)))
    printf("The indeex's starting or ending value is out of range ");
  else
    demo(str,s,e);
  return 0;
```

```
}
```

**Output:**

```
01-AlstonAlvares
Enter the Start Index:3
Enter the Last Index:5
I M

...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 07(b)**

**Aim:** Write a program to find the given string is palindrome or not.

**Algorithm:**

- i. Start
- ii. Check “hello” = palindrome
- iii. If true then print is a palindrome
- iv. If false then print is not a palindrome
- v. Check “madam”= palindrome
- vi. If true then print is a palindrome
- vii. If false then print is not a palindrome
- viii. Stop.

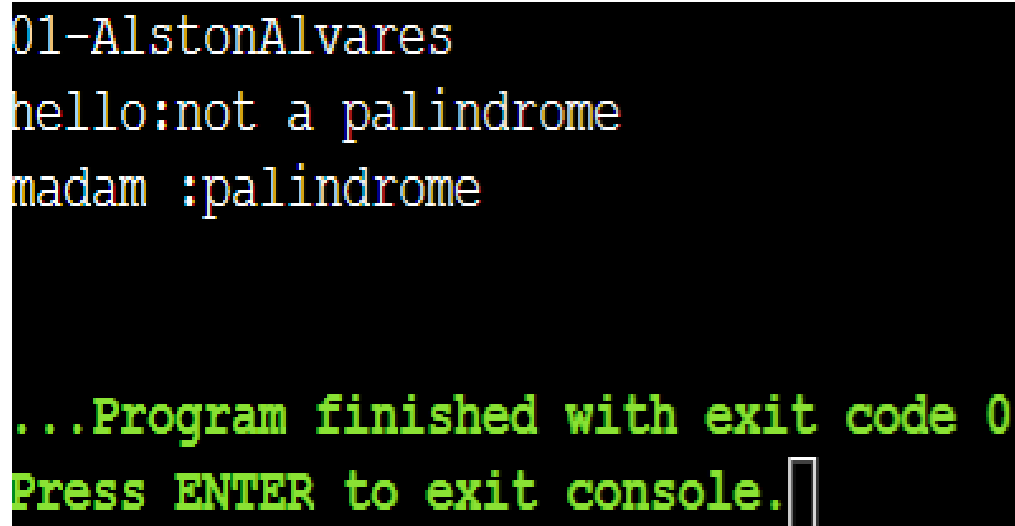
**Code:**

```
#include<stdio.h>
#include<string.h>
void isPal(char s[])
{
    int l = 0;
    int h = strlen(s)-1;
```



```
while(h>l)
{
    if(s[l++]!=s[h--])
    {
        printf("%s:not a palindrome\n",s);
        return;
    }
}
printf("%s :palindrome\n",s);
}

int main()
{ printf("01-AlstonAlvares\n");
  isPal("hello");
  isPal("madam");
  return 0;
}
```

**Output:**

```
01-AlstonAlvares
hello:not a palindrome
madam :palindrome

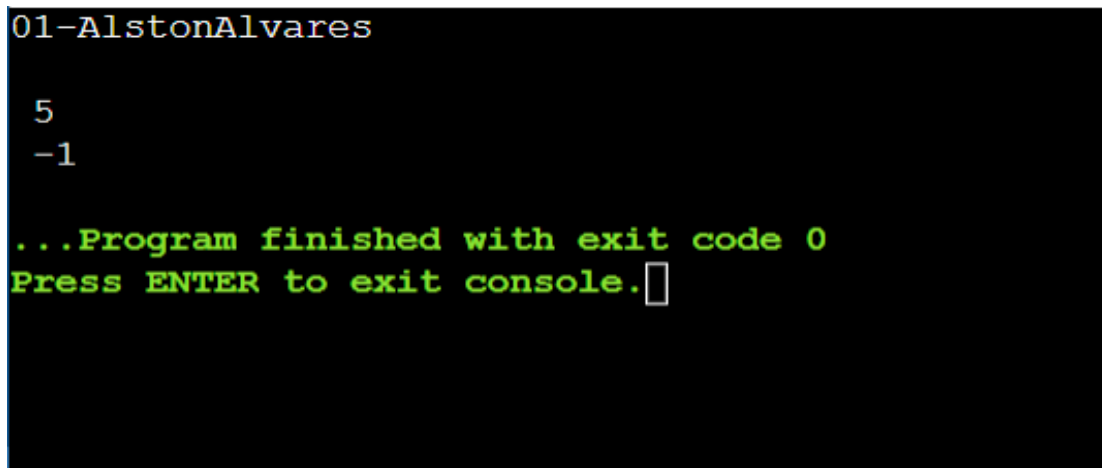
...Program finished with exit code 0
Press ENTER to exit console.█
```

**Experiment no – 07(c)****Aim: Write a program to using strlen(), strcmp() function.****Algorithm:**

- i. Start
- ii. Use strlen function
- iii. Use strcmp function
- iv. Print result
- v. Stop

**Code:**

```
#include<stdio.h>
#include<string.h>
int main()
{ printf("01-AlstonAlvares\n");
  int i;
  i=strlen("Hello");
  printf("\n %d",i);
  i=strcmp("Hello!","World");
  printf("\n %d",i);
  return 0;
}
```

**Output:**

```
01-AlstonAlvares
5
-1
...Program finished with exit code 0
Press ENTER to exit console.█
```

**Experiment no – 08(a)**

**Aim:** Write a program to display the values using different data types and its address using pointer.

**Algorithm:**

- i. Start
- ii. Declare v1,v2,v3
- iii. Declare \*p1,\*p2,\*p3
- iv. Insert values
- v. Print result
- vi. Stop

**Code:**

```
#include <stdio.h>

int main()
{ printf("01-AlstonAlvares\n");
  int v1;
  float v2;
  char v3;
  int *p1;
  float *p2;
  char *p3;
  v1=11;
  v2=3.14;
  v3='Y';
  p1 = &v1;
  p2 = &v2;
  p3 = &v3;
  printf("Address of v1 = %u\n", &v1); printf("Value is = %d\n", *p1);
  printf("Address of v2 = %u\n", &v2);
  printf("Value is = %f\n", *p2);
  printf("Address of v3 = %u\n", &v3);
  printf("Value is = %c\n", *p3);
```

```
return 0;  
}
```

**Output:**

```
Output:  
  
01-AlstonAlvares  
Address of v1 = 3606883000  
Value is = 11  
Address of v2 = 3606883004  
Value is = 3.140000  
Address of v3 = 3606882999  
Value is = Y
```

**Experiment no – 08(b)**

**Aim:** Write a program to perform addition and subtraction using pointer.

**Algorithm:**

- i. Start
- ii. Enter numbers
- iii. Addition or Subtraction is performed
- iv. Display results
- v. Stop

**Code:**

```
//Add//  
  
#include<stdio.h>  
  
int main()  
{ printf("01-AlstonAlvares\n");  
  int num1 ,num2, *p,*q,sum;  
  printf("Enter any two integers:\n");  
  scanf("%d%d", &num1,&num2);
```

```
    p = &num1;
    q = &num2;
    sum = *p+*q;

    printf("Sum= %d\n",sum);

    return 0;
}

//Sub//

#include<stdio.h>
int main()
{ printf("01-AlstonAlvares\n");
  int num1 ,num2, *p,*q,sub;
  printf("Enter any two integers:\n");
  scanf("%d%d", &num1,&num2);
  p = &num1;
  q = &num2;
  sub = *p-*q;

  printf("Sub= %d\n",sub);

  return 0;
}
```

**Output:****Add**

```
01-AlstonAlvares
Enter any two integers:
1 1
Sum= 2

...Program finished with exit code 0
Press ENTER to exit console.█
```

**Sub**

```
01-AlstonAlvares
Enter any two integers:
27 11
Sub= 16

...Program finished with exit code 0
Press ENTER to exit console.█
```

**Experiment no – 09(a)**

**Aim:** Write a program to copy the contents of the file from one file into other.

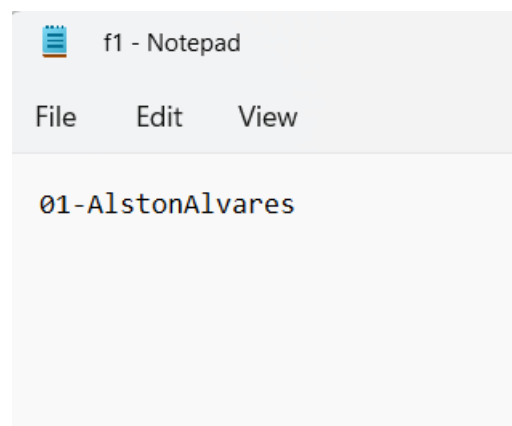
**Algorithm:**

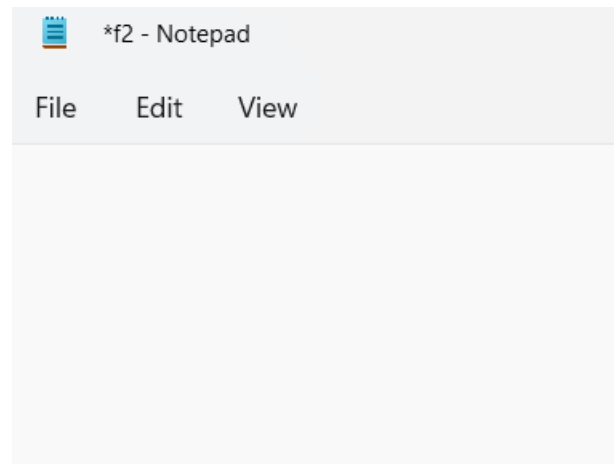
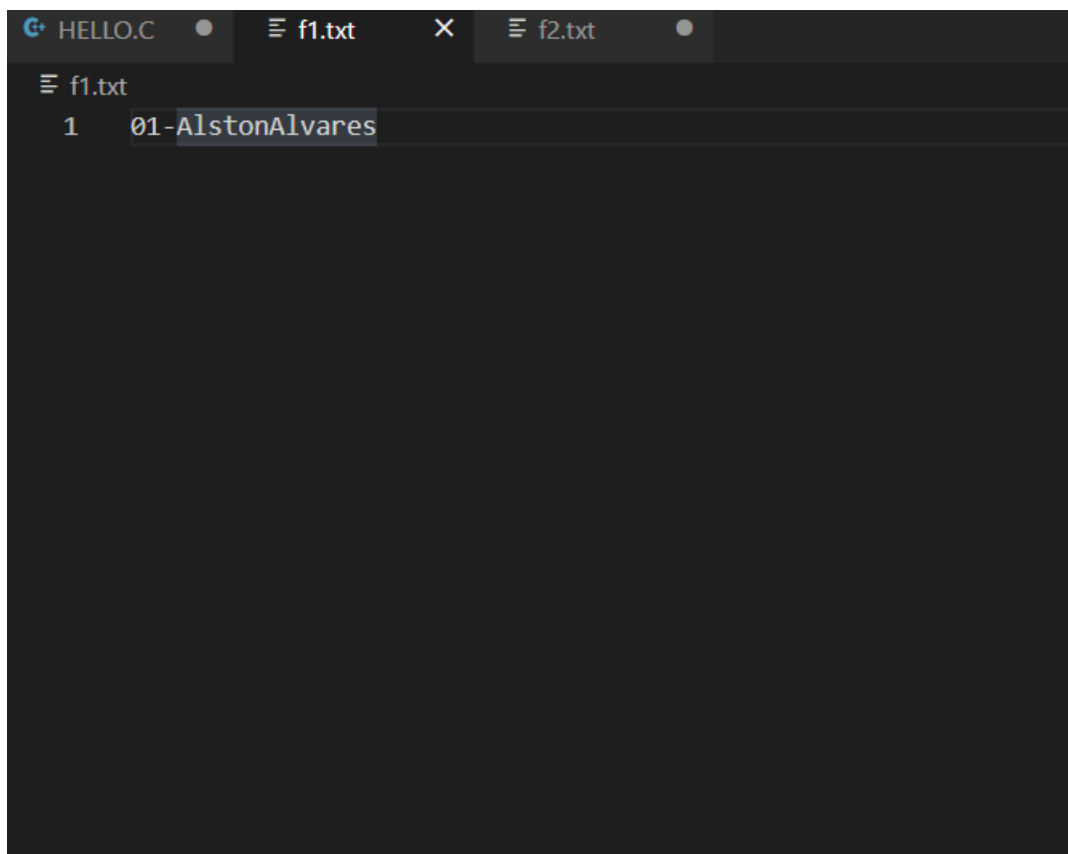
- i. Start
- ii. Create 2 files, f1 and f2
- iii. Add text to f1
- iv. Use `getc`, `putc`, `FILE`.
- v. Open f2
- vi. File f1's content has been copied to f2
- vii. Stop

**Code:**

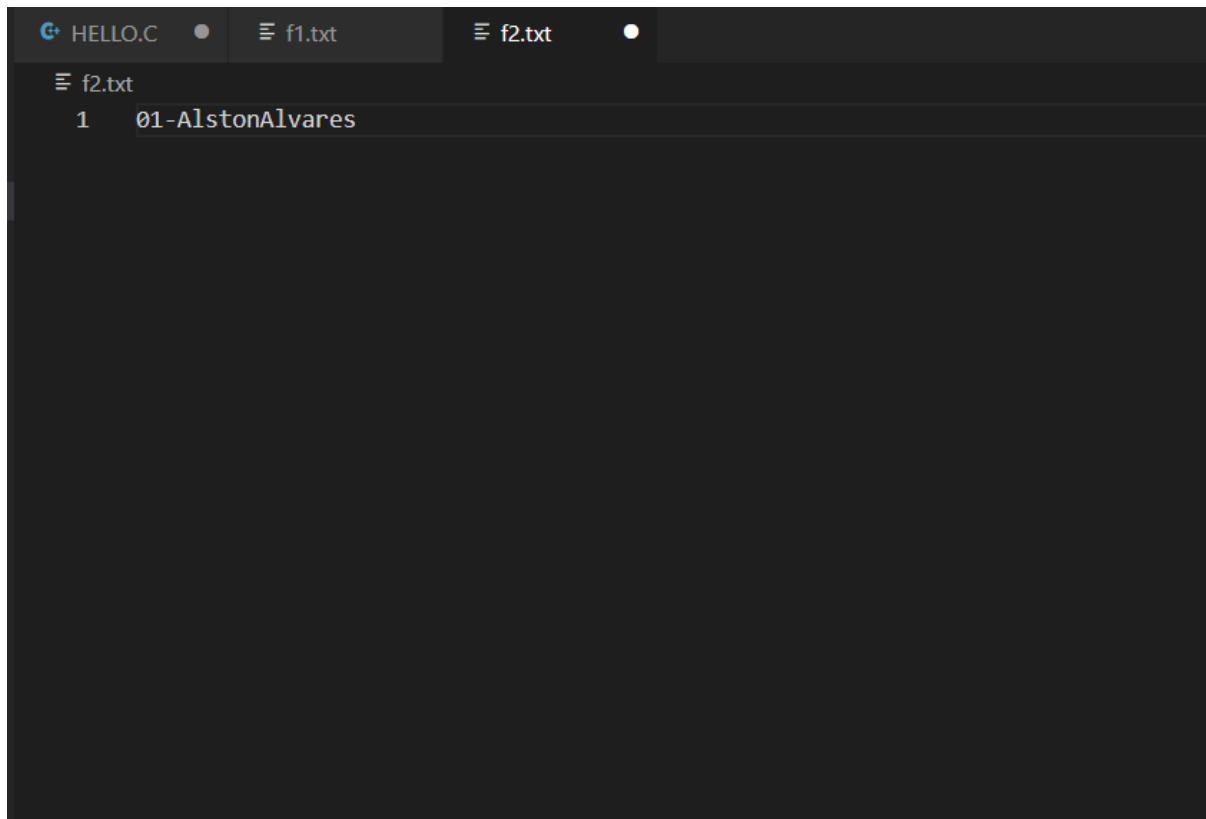
```
#include<stdio.h>

main()
{
    FILE *fp1, *fp2;
    char ch;
    fp1 = fopen("f1.txt", "r");
    fp2 = fopen("f2.txt", "w");
    while((ch = getc(fp1)) != EOF)
        putc(ch, fp2);
    fclose(fp1);
    fclose(fp2);
    getch();
}
```



**Output:**





### Experiment no – 09(b)

**Aim:** Write a program to print the structure using

- Title
- Author
- Subject
- Book ID Print the details of two students.

**Code:**

```
#include<stdio.h>

struct book
{
char Title[40];
char Author[40];
char Subject[40];
int Book_ID;
};

int main()
```

```
{  
    printf("01-AlstonAlvares\n.");  
    struct book b[3];  
    int i;  
    for(i=0; i<3; i++)  
    {  
        printf("Enter details of book #%d\n", i+1);  
        printf("Enter book Id: ");  
        scanf("%d", &b[i].Book_ID);  
        printf("Enter book Title: ");  
        scanf("%s", &b[i].Title);  
        printf("Enter book Subject: ");  
        scanf("%s", &b[i].Subject);  
        printf("Enter book Author: ");  
        scanf("%s", &b[i].Author); }  
    for(i=0; i<3; i++)  
    {  
        printf("\nBook %d..... .\n\n", i+1);  
        printf("Book Id: %d\n", b[i].Book_ID);  
        printf("Book Name: %s\n", b[i].Title);  
        printf("Book Subject: %s\n", b[i].Subject);  
        printf("Book Author: %s\n", b[i].Author);  
    }  
    return 0;  
}
```

**Output:**

```
01-AlstonAlvares
.Enter details of book #1
Enter book Id: 101
Enter book Title: CJ
Enter book Subject: CoreJAVA
Enter book Author: Sambare
Enter details of book #2
Enter book Id: 102
Enter book Title: PP
Enter book Subject: PythonProgramming
Enter book Author: Sambare
Enter details of book #3
Enter book Id: 103
Enter book Title: OS
Enter book Subject: OperatingSystem
Enter book Author: Sambare
```

Book 1..... .

```
Book Id: 101
Book Name: CJ
Book Subject: CoreJAVA
Book Author: Sambare
```

Book 2..... .

```
Book Id: 102
Book Name: PP
Book Subject: PythonProgramming
Book Author: Sambare
```

Book 3..... .

```
Book Id: 103
Book Name: OS
Book Subject: OperatingSystem
Book Author: Sambare
```

```
...Program finished with exit code 0
Press ENTER to exit console.
```

**Experiment no – 10**

**Aim:** Create a mini project on “Bank management system” . The program should be menu driven

**Algorithm:**

- i. Start
- ii. Enter number of customers record to enter
- iii. Read the number
- iv. Enter account number
- v. Enter name
- vi. Display Press 1 to deposit amount, Press 2 to withdraw amount, Press 0 to Exit.
- vii. Stop

**Code:**

```
#include <stdio.h>

struct customer
{
    int account_no;
    char name[80];
    int balance;
};

void accept(struct customer[], int);
int search(struct customer[], int, int);
void deposit(struct customer[], int, int, int);
void withdraw(struct customer[], int, int, int);

int main()
{
    struct customer data[20];
    int n, choice, account_no, amount, index;
    printf("Banking System\n\n");
    printf("Number of customer records you want to enter? :");
    scanf("%d", &n);
    accept(data, n);
    do
    {
```

```
printf("\nBanking System Menu:\n");
printf("Press 1 to deposit amount.\n");
printf("Press 2 to withdraw amount.\n");
printf("Press 0 to exit\n");
printf("\nEnter choice(0-4): ");
scanf("%d", &choice);
switch (choice)
{

case 1:
printf("Enter account number: ");
scanf("%d", &account_no);
printf("Enter amount to deposit: ");
scanf("%d", &amount);
deposit(data, n, account_no, amount);
break;

case 2:
printf("Enter account number: ");
scanf("%d",&account_no),
printf("Enter amount to withdraw :");
scanf("%d",&amount);
withdraw(data, n, account_no, amount);
}
}
while (choice != 0);
return 0;
}
void accept(struct customer list[80], int s)
```

```
{
int i;
for (i = 0; i < s; i++)
{
printf("\nEnter data for Record #%d", i + 1);
printf("\nEnter account_no: ");
scanf("%d", &list[i].account_no);
printf("01-AlstonAlvares ");
gets(list[i].name);
list[i].balance = 0;
}
}

int search(struct customer list[80], int s, int number)
{
int i;
for (i = 0; i < s; i++)
{
if (list[i].account_no == number)
{
return i;
}
}
return -1;
}

void deposit(struct customer list[], int s, int number, int amt)
{
int i = search(list, s, number);
if (i == -1)
{
printf("Record not found");
}
}
```

```
else
{
list[i].balance+=amt;
}
}

void withdraw(struct customer list[], int s, int number, int amt)
{
int i=search(list, s, number);
if(i== -1)
{
printf("Record not found\n");
}
else if (list[i].balance < amt)
{
printf("Insufficient balance\n");
}
else
{
list[i].balance-=amt;
}
}
```

**Output:**

```
Banking System
Number of customer records you want to enter? :1
Enter data for Record #1
Enter account_no: 403
01-AlstonAlvares
Banking System Menu:
Press 1 to deposit amount.
Press 2 to withdraw amount.
Press 0 to exit
Enter choice(0-4): 0
...Program finished with exit code 0
Press ENTER to exit console.
```

```
Banking System
Number of customer records you want to enter? :1
Enter data for Record #1
Enter account_no: 403
01-AlstonAlvares
Banking System Menu:
Press 1 to deposit amount.
Press 2 to withdraw amount.
Press 0 to exit
Enter choice(0-4): 1
Enter account number: 403
Enter amount to deposit: 5000
Banking System Menu:
Press 1 to deposit amount.
Press 2 to withdraw amount.
Press 0 to exit
Enter choice(0-4): 2
Enter account number: 403
Enter amount to withdraw :1000
Banking System Menu:
Press 1 to deposit amount.
Press 2 to withdraw amount.
Press 0 to exit
Enter choice(0-4): 0
...Program finished with exit code 0
Press ENTER to exit console.
```