Bachelors of Science
SEM I
Journal

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

ANANDIBAI DAMODAR KALE

SHAIKSHANIK SANSTHA'S

ANANDIBAI DAMODAR KALE

DEGREE COLLEGE OF ARTS & COMMERCE

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.

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Teacher In-Charge Head of Department

External Examiner

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Experiment no – 01(a)

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

Algorithm:

Step 1: Start

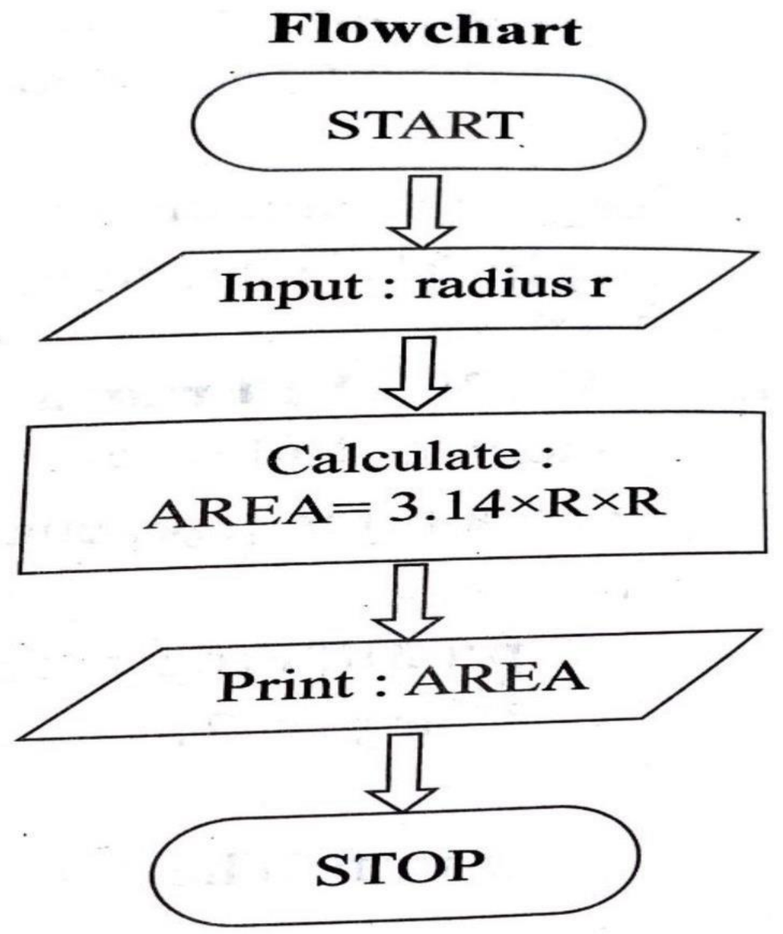
Step 2: Read the circle's radius R value.

Step 3: Calculate area oof circle i.e. AREA= 3.14 x R x R

Step 4: Print AREA

Step 5: Stop

Flowchart:



Conclusion : Successfully Drawn flowchart and wrote an algorithm.

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

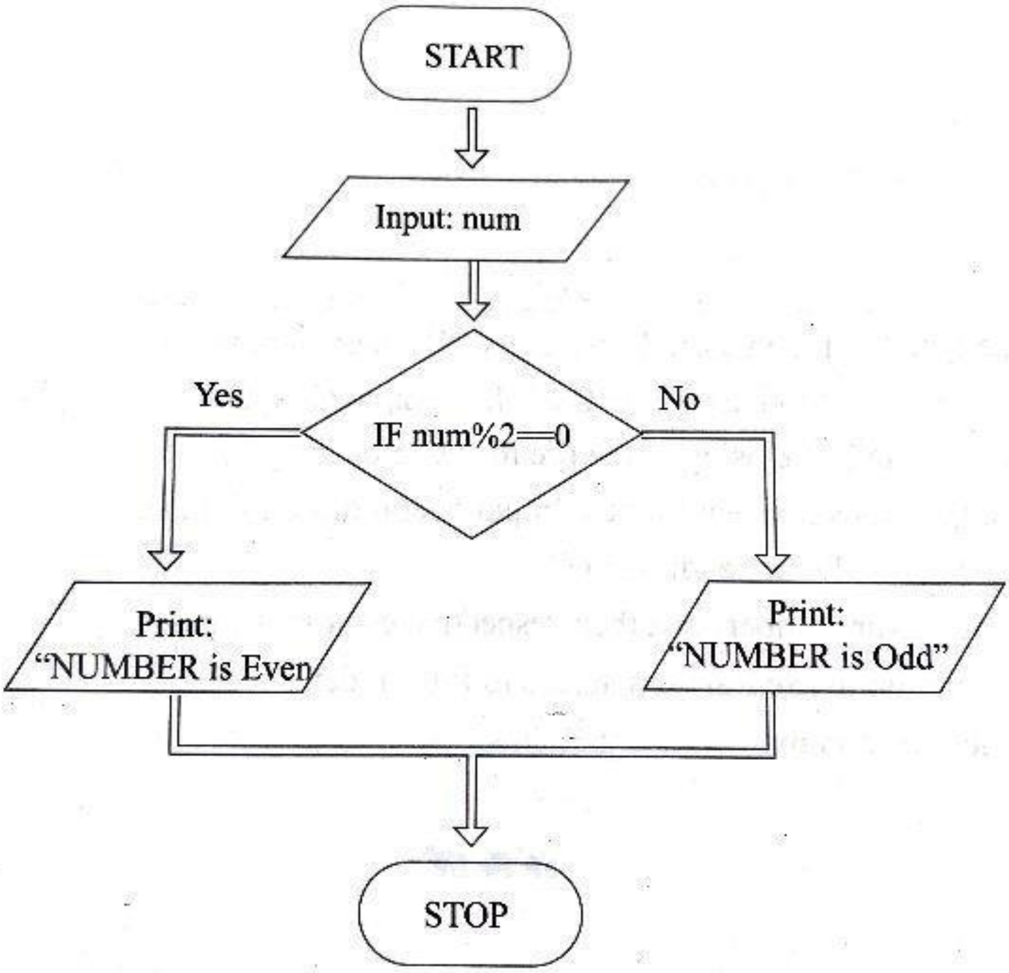
Step 4: If REM = 0 Then go to Step 6

Step 5: Print “NUMBER is Odd” go to step 7

Step 6: Print “NUMBER is Even”

Step 7: Stop

Flowchart:



Conclusion : Successfully Drawn flowchart and wrote an algorithm.

Experiment no – 01(c)

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

Algorithm:

Step 1: Start

Step 2: Initialize the variable NUM = 1

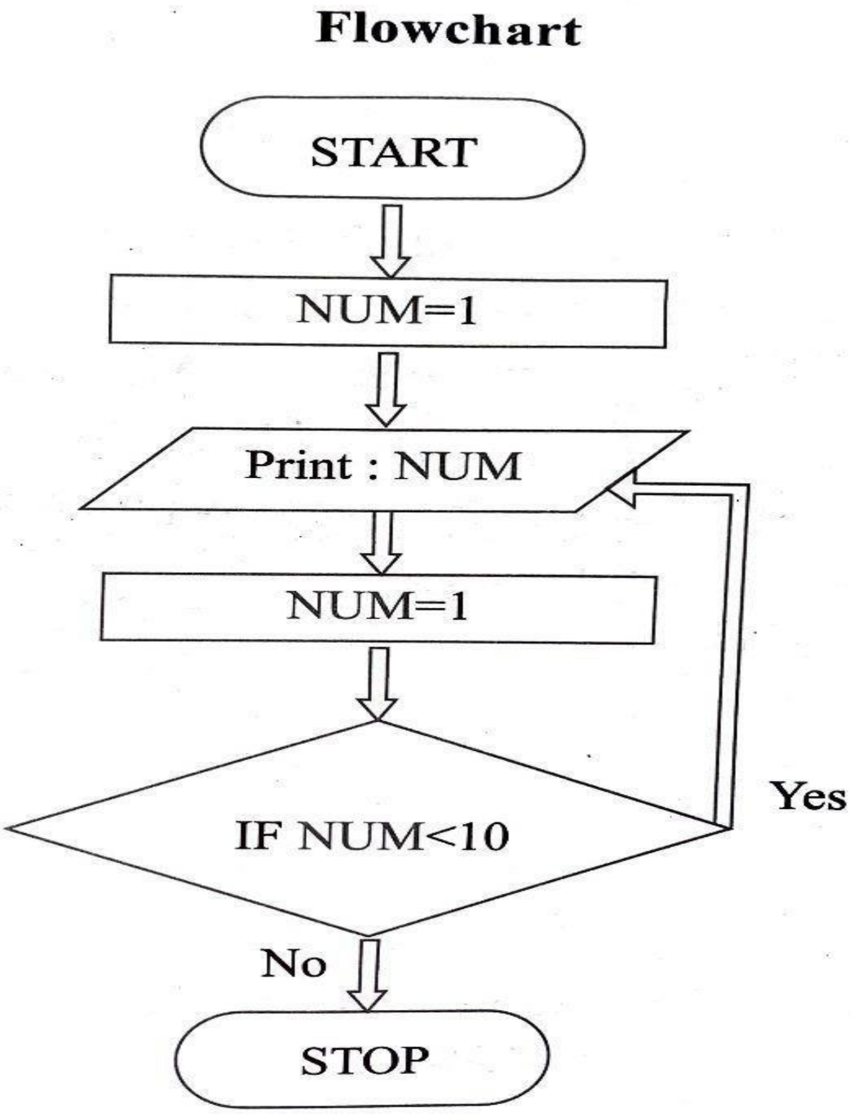
Step 3: Print NUM

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

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

Step 6: Stop

Flowchart:



Conclusion : Successfully Drawn flowchart and wrote an algorithm.

Experiment no – 01(d)

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

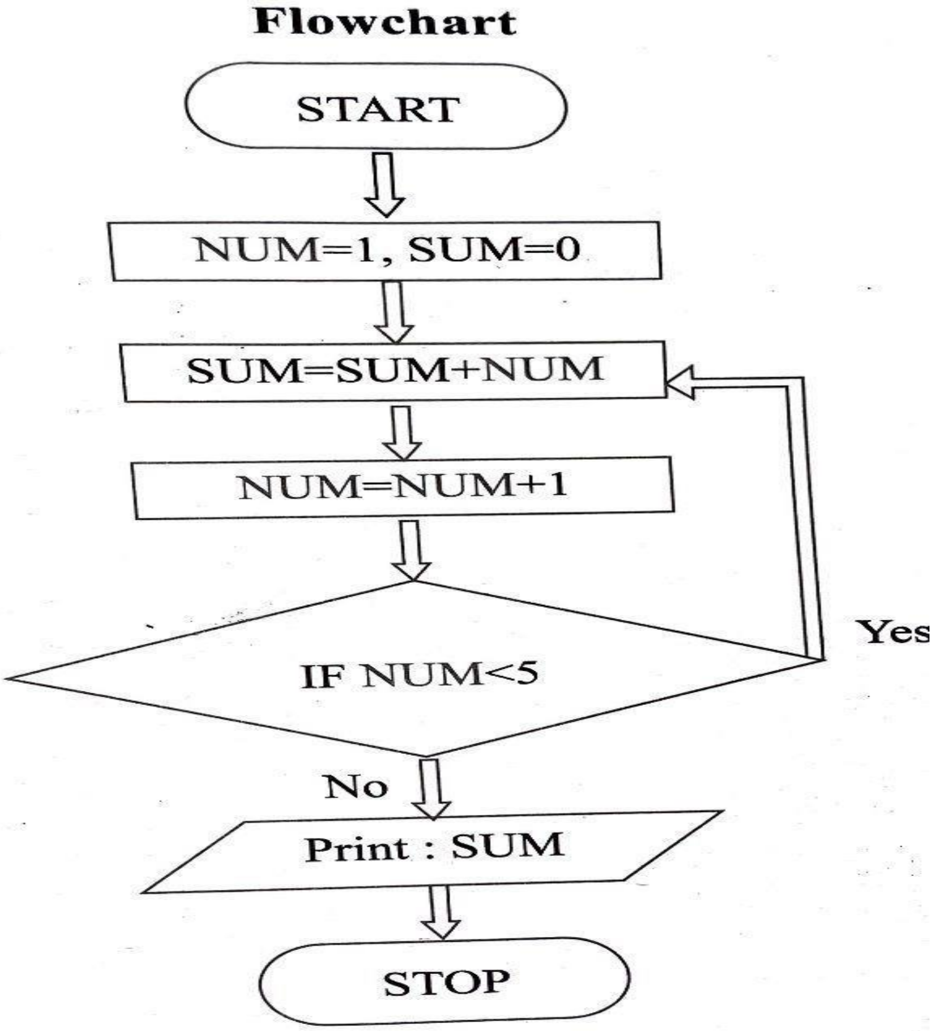
Step 4: Increment NUM by 1 NUM=NUM+1

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

Step 6: Print SUM

Step 7: Stop

Flowchart:



Conclusion : Successfully Drawn flowchart and wrote an algorithm.

Experiment no – 01(e)

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

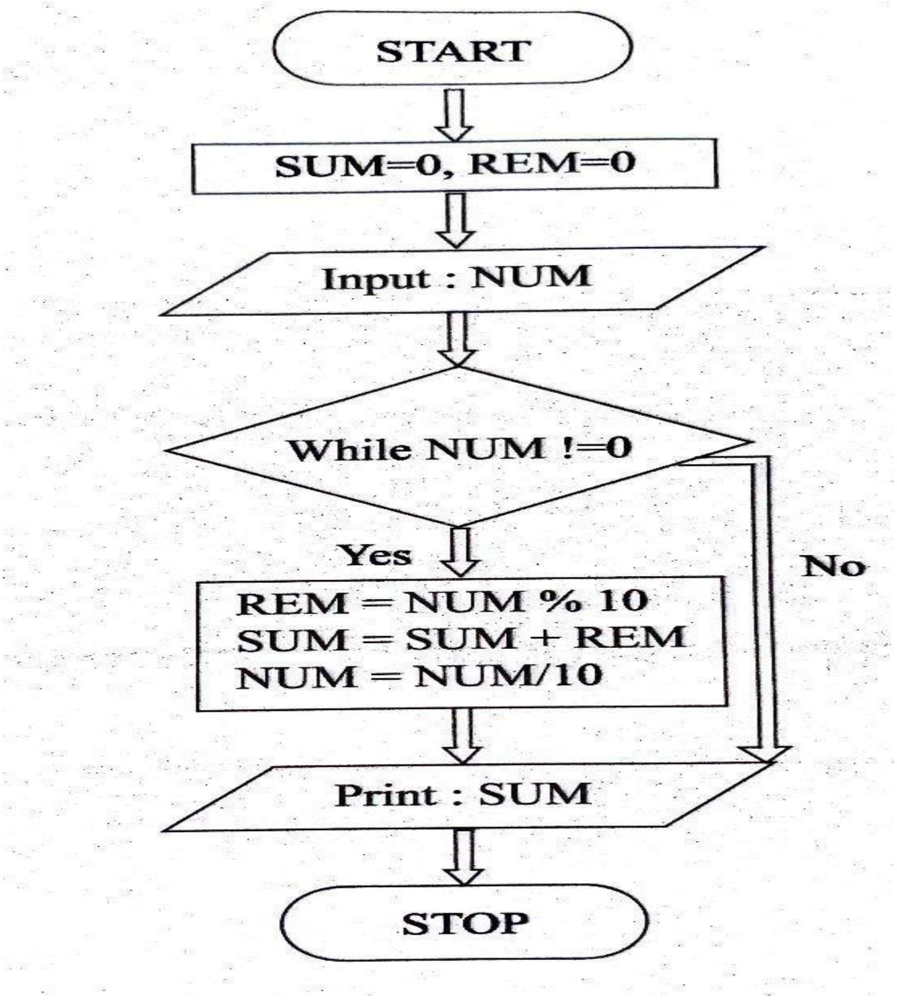
Step 4: Perform REM = NUM % 10 and add REM to SUM i.e. SUM = SUM + REM

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:



Conclusion : Successfully Drawn flowchart and wrote an algorithm.

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.

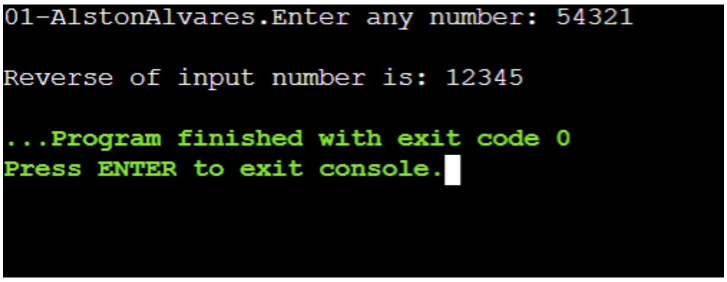
v. Divide numbered by 10, like numbered/10.

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.
```

Conclusion : Successfully performed program using while loop to reverse the digits of a number.

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

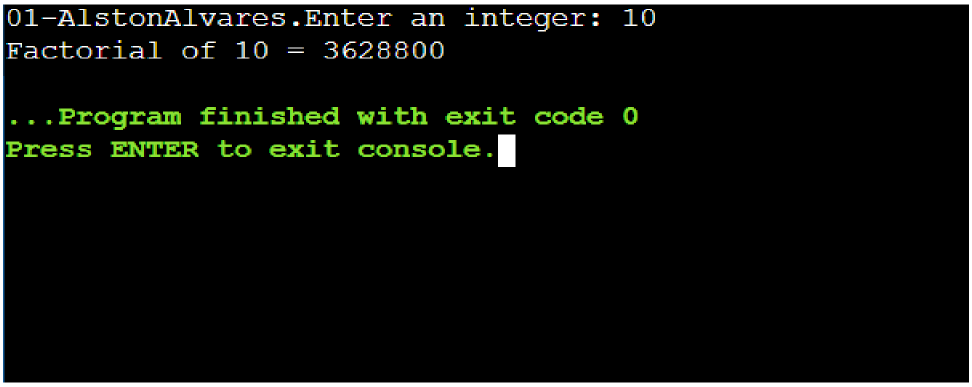
v. The final value at the end of all the multiplication till 1 is the factorial

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.
```

Conclusion : Successfully performed a program to calculate the factorial of a given number.

Experiment no – 02(c)

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

Algorithm:

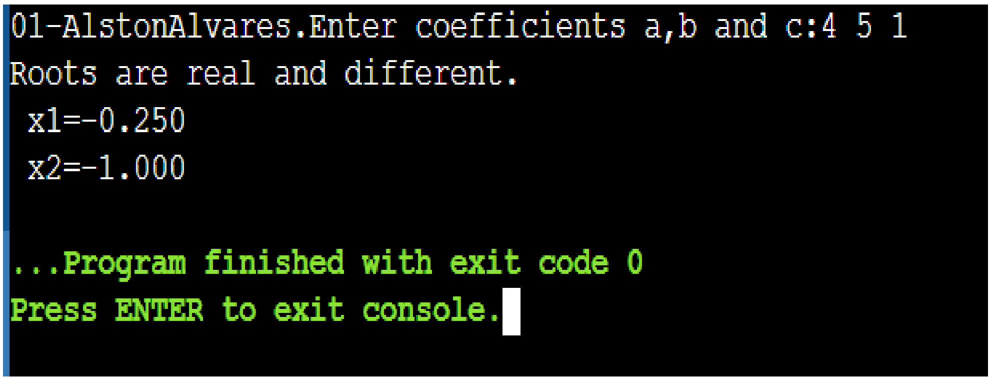
```
i.    Start
ii.   Read a, b, c values
iii.  Compute d = b2 4ac
iv.   if d > 0 then
          i.   r1 = b+ sqrt (d)/(2*a)
          ii.  r2 = b sqrt(d)/(2*a)
v.    Otherwise if d = 0 then
          i.   compute r1 = -b/2a, r2=-b/2a
          ii.  print r1,r2 values
vi.   Otherwise if d < 0 then print 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.
```

Conclusion : Successfully performed a program to find the roots of quadratic equation**.**

Experiment no – 02(d)

Aim: Write a program to print the Fibonacci series.

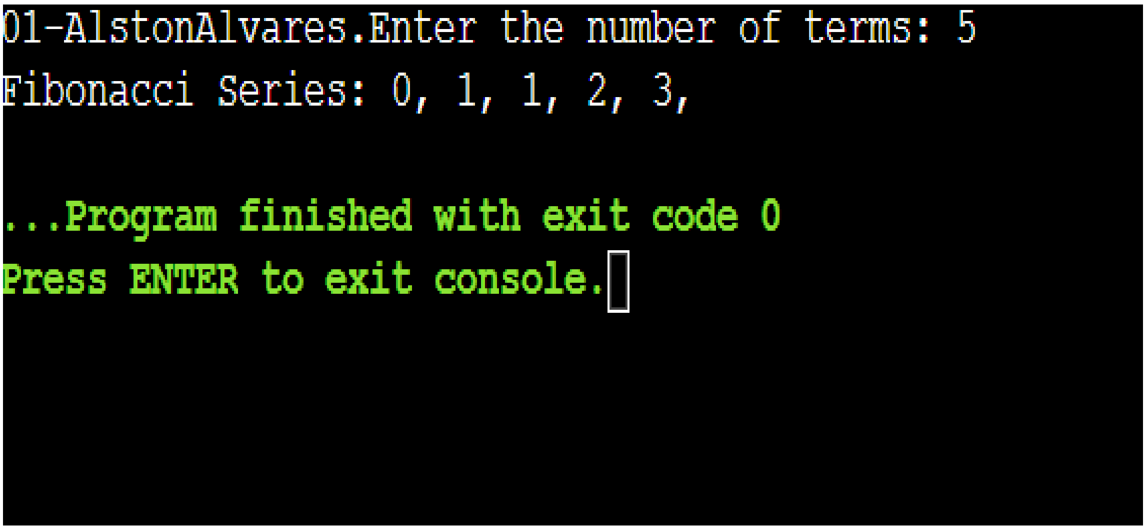
Algorithm:

```
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.
```

Conclusion : Successfully performed a program to print the Fibonacci series**.**

Experiment no – 03(a)

Aim: Write a program in C to check entered character vowel or consonant.

Algorithm:

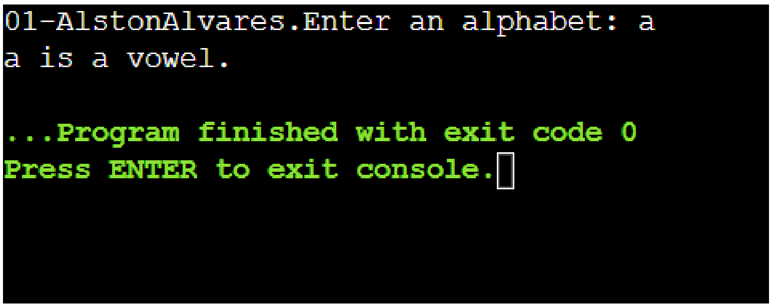
```
i.    Start
ii.   Declare character type variable ch
iii.  Read ch from User
iv.   // Checking both lower and upper case vowels.
v.    IF (ch == 'a' || ch == 'A' ||
              i.   ch == 'e' || ch == 'E' ||
              ii.  ch == 'i' || ch == 'I' ||
              iii. ch == 'o' || ch == 'O' ||
              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.
```

Conclusion : Successfully performed **a** program in C to check entered character vowel or consonant.

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”.

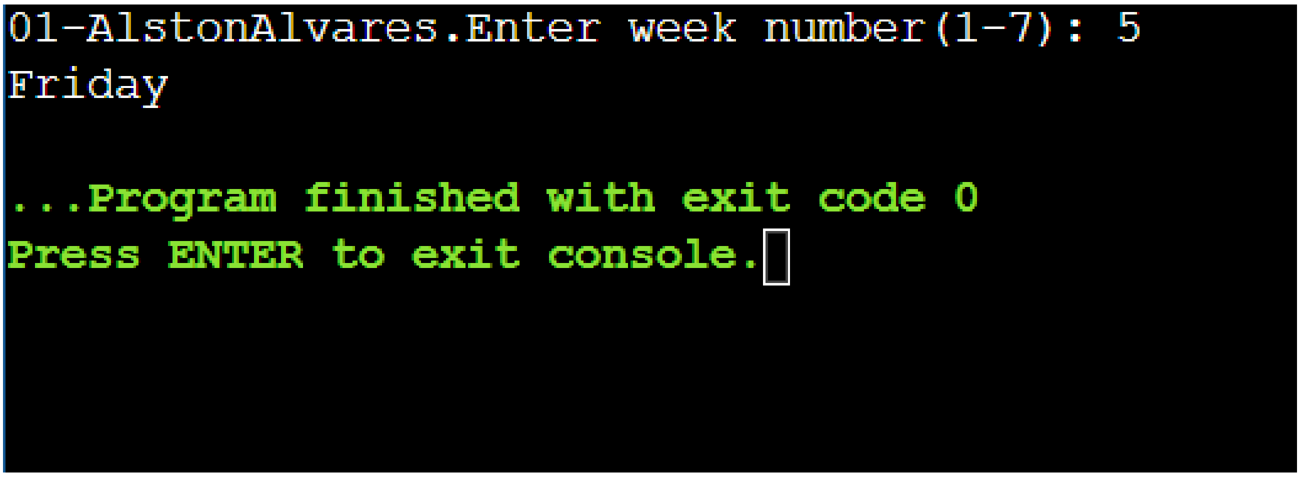
Code:

```
#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.
```

Conclusion : Successfully performed a program to C program to print day name of week using switch-case.

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:

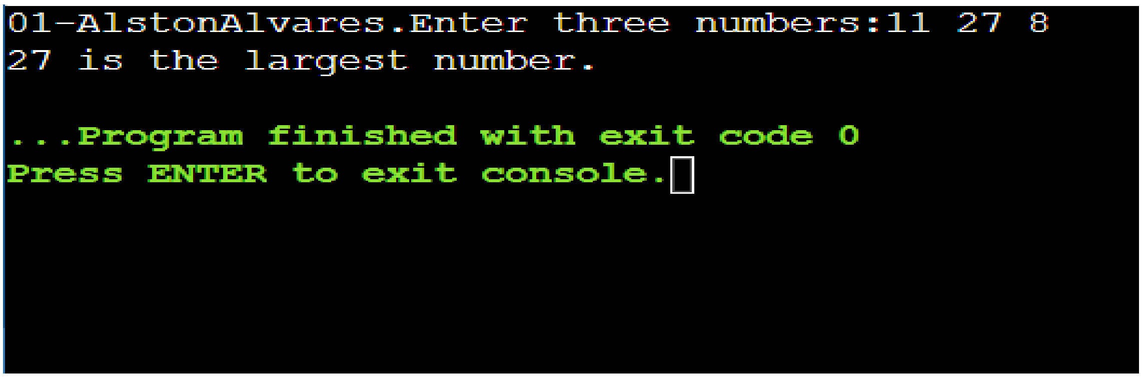
```
i.    Ask the user to enter three integer values.
ii.   Read the three integer values in num1, num2, and num3 (integer variables).
iii.  Check if num1 is greater than num2.
iv.   If true, then check if num1 is greater than num3.
          a. If true, then print ‘num1’ as the greatest number.
          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, lrg;
printf("Enter three numbers:");
scanf("%d %d %d", &N1, &N2, &N3);
lrg = N1 > N2 ? (N1 > N3 ? N1 : N3) : (N2 > N3 ? N2 : N3);
printf("%d is the largest number.",lrg);
return 0;
}
```

Output:



```
01-AlstonAlvares.Enter three numbers:11 27 8
27 is the largest number.

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

Conclusion : Successfully performed a program to read three values from keyboard and print out the largest of them without using if statement.

Experiment no – 04(a)

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

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

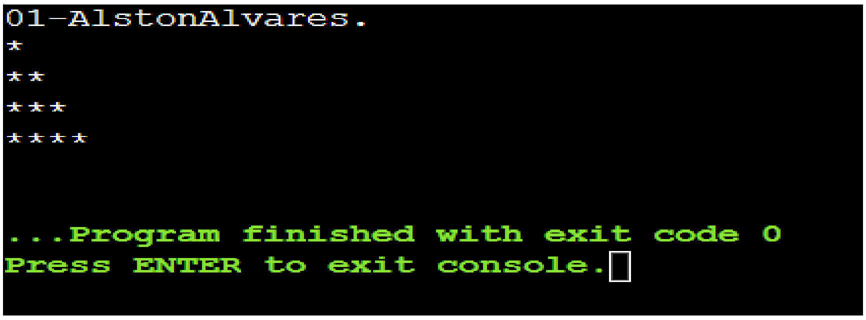
Algorithm:

```
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.
```

Conclusion : Successfully performed a program to print the pattern of asterisks.

Experiment no – 04(b)

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

```
* * * * *

* * * *

* * *

* *

*
```

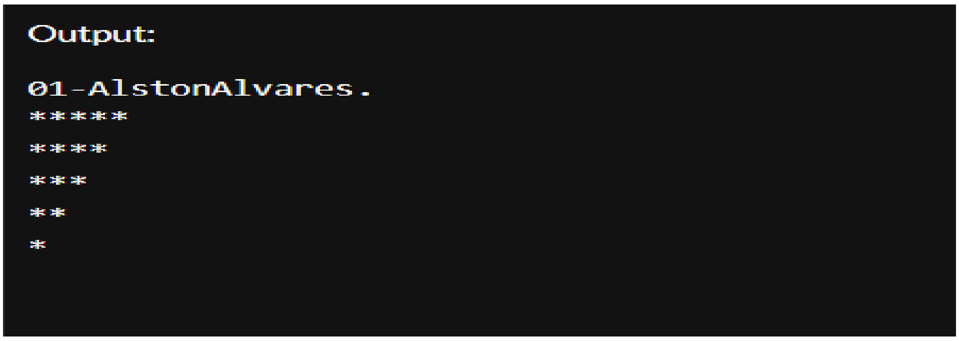
Algorithm:

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.
*****
****
***
**
*
```

Conclusion : Successfully performed a program to print the pattern of asterisks.

Experiment no – 04(c)

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

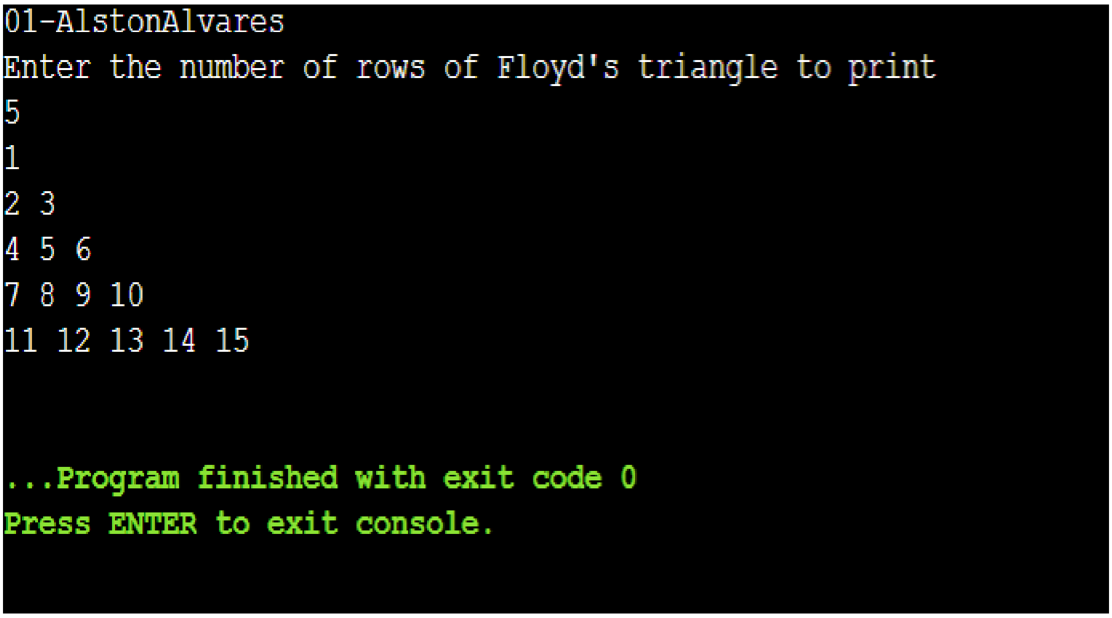
Algorithm:

```
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 1as 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:

```c
#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.
```

Conclusion : Successfully performed a program to print Floyd’s Triangle.

Experiment no – 05(a)

Aim: Write a program to print area of square using function.

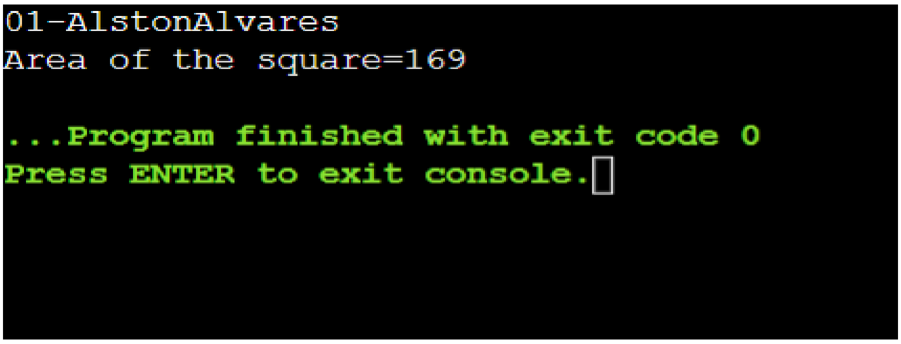
Algorithm:

i. Start.
ii. Declare at s as integer.
iii. Initialize value of s.
iv. Calculate at s×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.
```

Conclusion : Successfully performed a program to print area of square using function.

Experiment no – 05(b)

Aim: Write a program using recursive function.

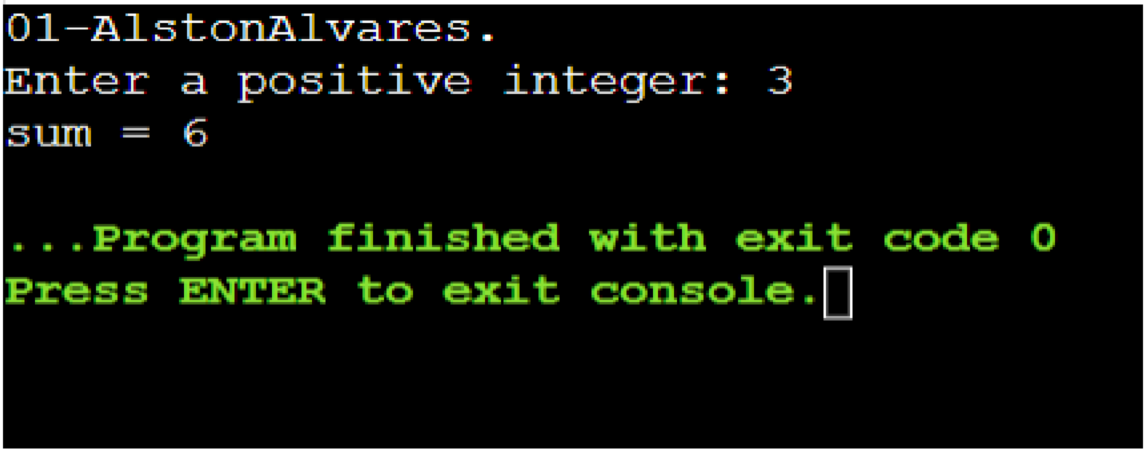
Algorithm:

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.
```

Conclusion : Successfully performed a program using recursive function

Experiment no – 05(c)

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

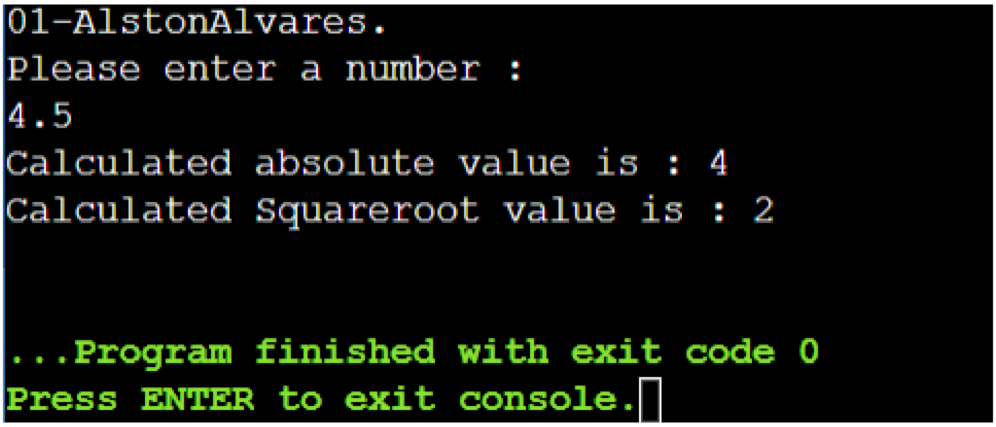
Algorithm:

```
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.
```

Conclusion : Successfully performed a program to square root, abs() value using function.

Experiment no – 05(d)

Aim: Write a program using go to statement.

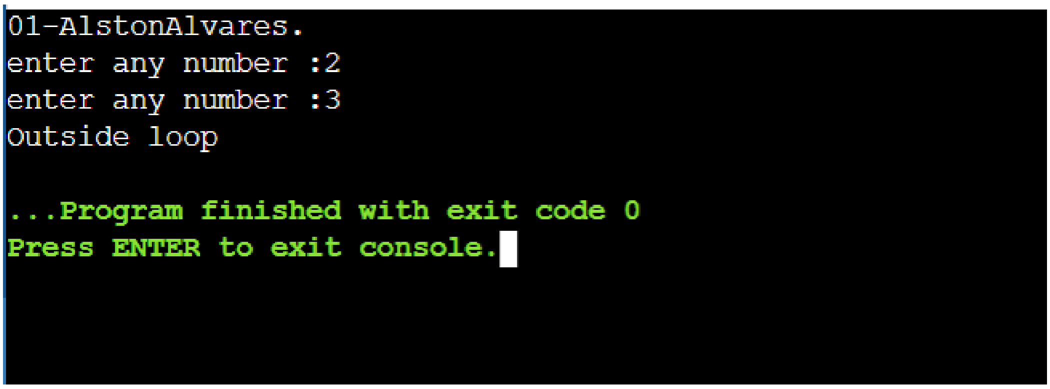
Algorithm:

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:



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

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

Conclusion : Successfully performed a program using go to statement.

Experiment no – 06(a)

Aim: a. Write a program to print rollno and names of 10 students using array.

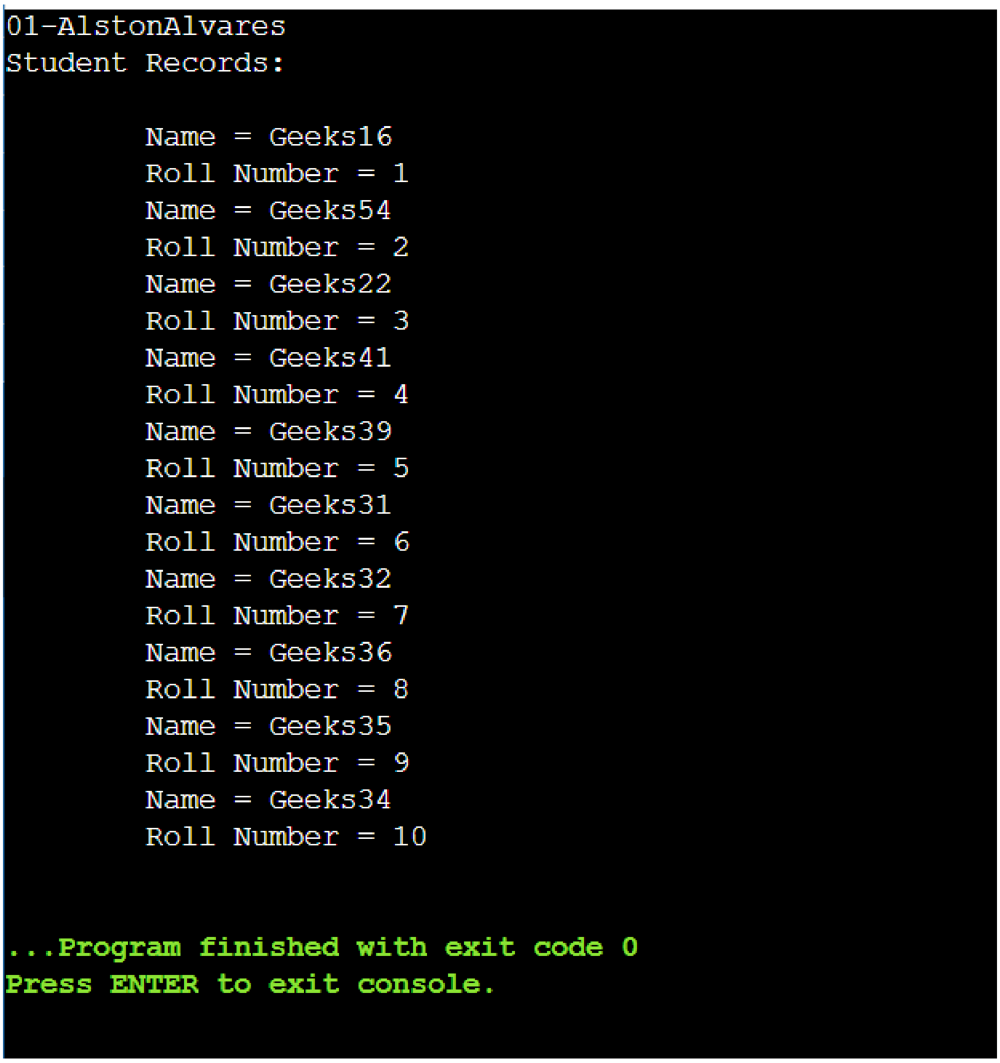
Algorithm:

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.
```

Conclusion : Successfully performed a program to print rollno and names of 10 students using array.

Experiment no – 06(b)

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

Algorithm:

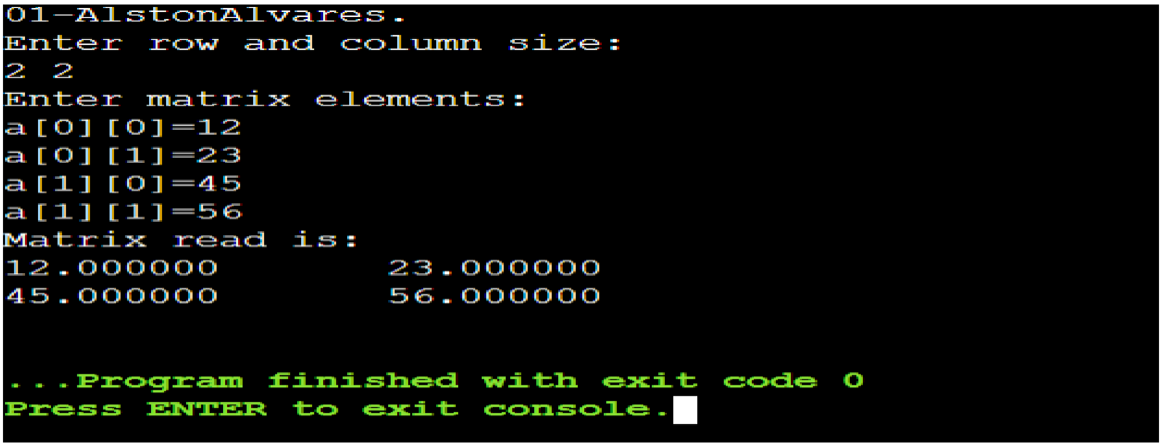
i. Start
ii. Enter row and column size
iii. Construct Matrix
iv. Display result
v. Stop

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.
```

Conclusion : Successfully performed a program to read a matrix of size m*n**.**

Experiment no – 06(c)

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

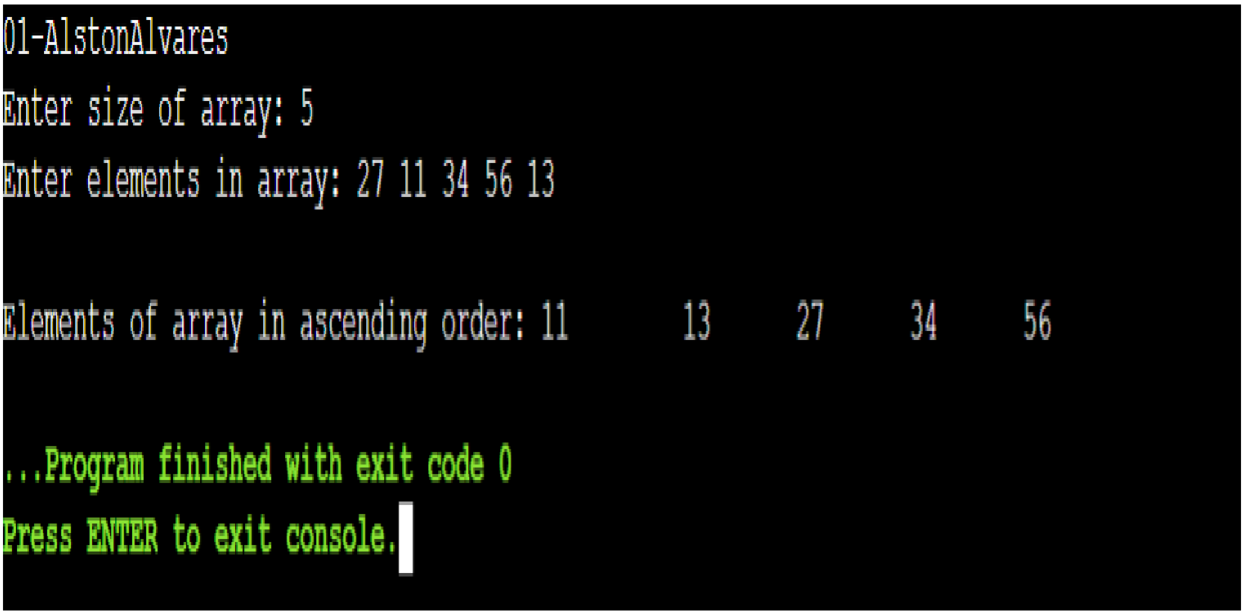
Algorithm:

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.
```

Conclusion : Successfully performed a program to sort the elements of array in ascending or descending order.

Experiment no – 07(a)

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

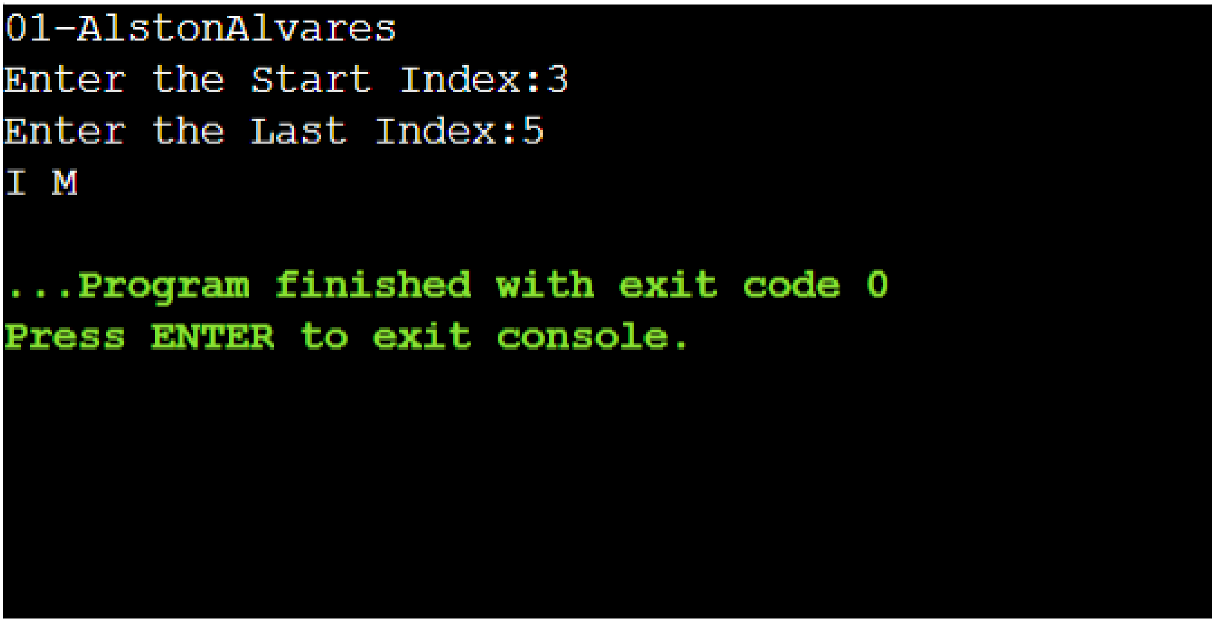
Algorithm:

```
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.
```

Conclusion : Successfully performed a program to extract the portion of a character string and print the extracted part.

Experiment no – 07(b)

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

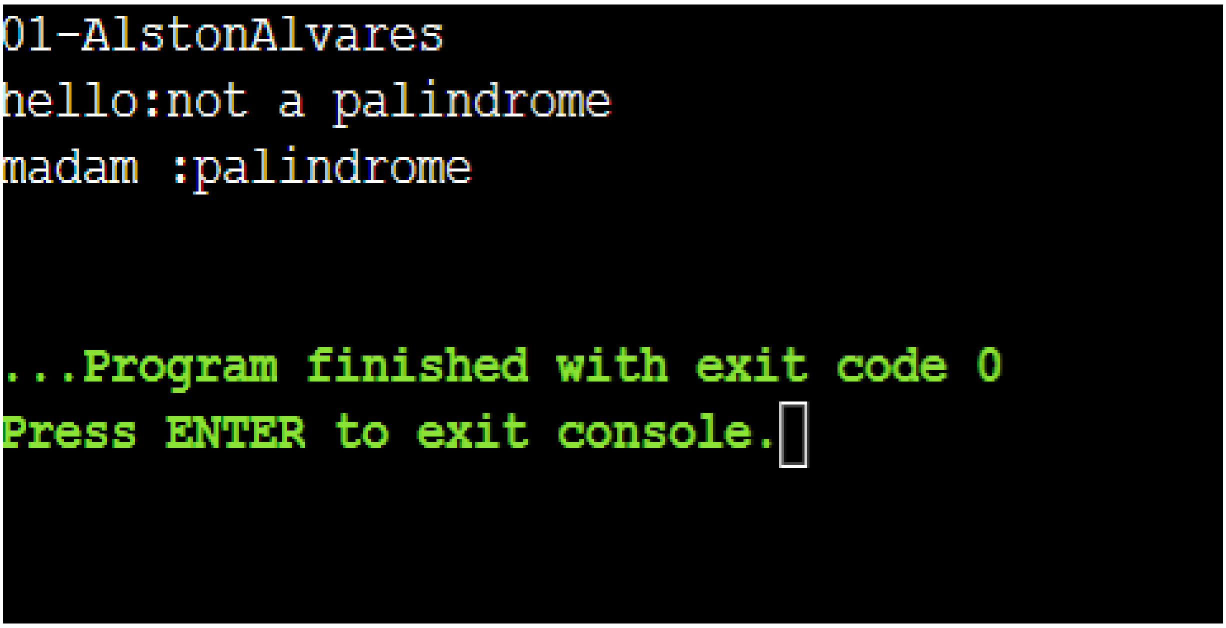
Algorithm:

```
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.
```

Conclusion : Successfully performed a program to find the given string is palindrome or not.

Experiment no – 07(c)

Aim: **Write a program to using strlen(), strcmp() function.**

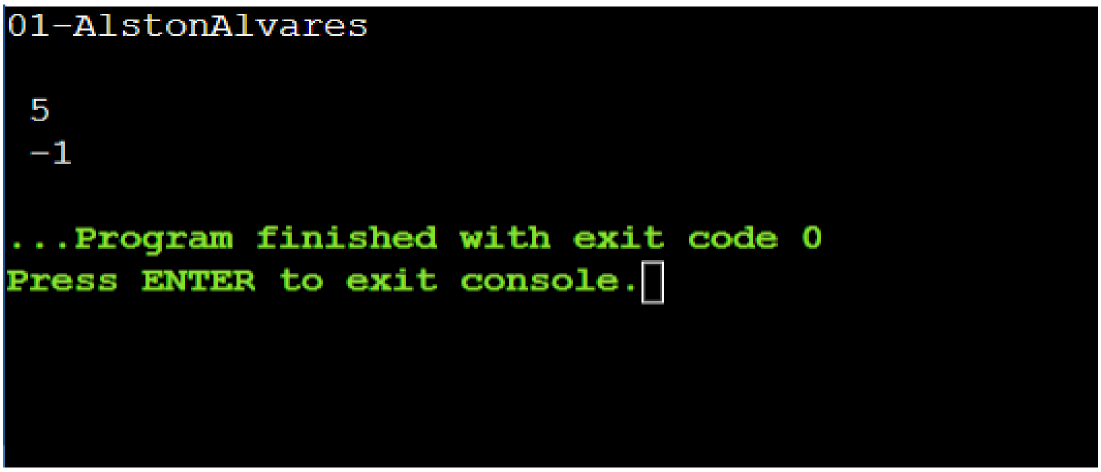
Algorithm:

```
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.
```

Conclusion : Successfully performed a program to using strlen(), strcmp() function.

Experiment no – 08(a)

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

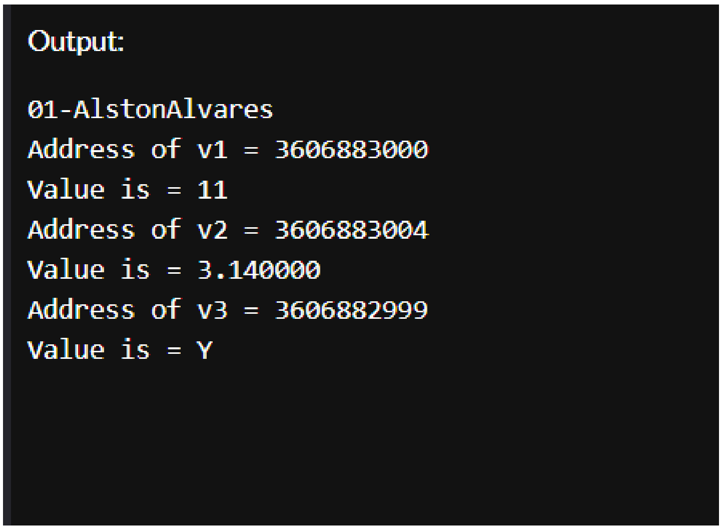
Algorithm:

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

Code:

```c
#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
```

Conclusion : Successfully performed a program to display the values using different data types and its address using pointer.

Experiment no – 08(b)

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

Algorithm:

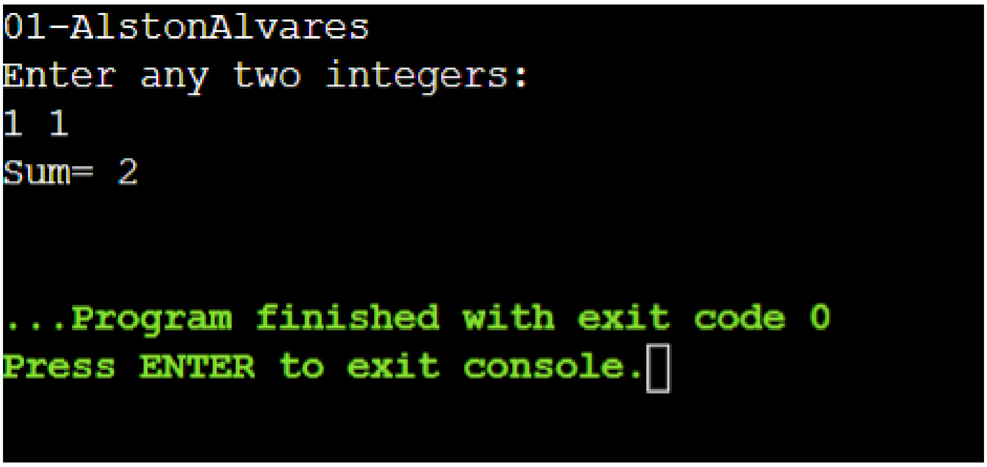
i. Start
ii. Enter numbers
iii. Addition or Subtraction is performed
iv. Display results
v. Stop

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;
}
```

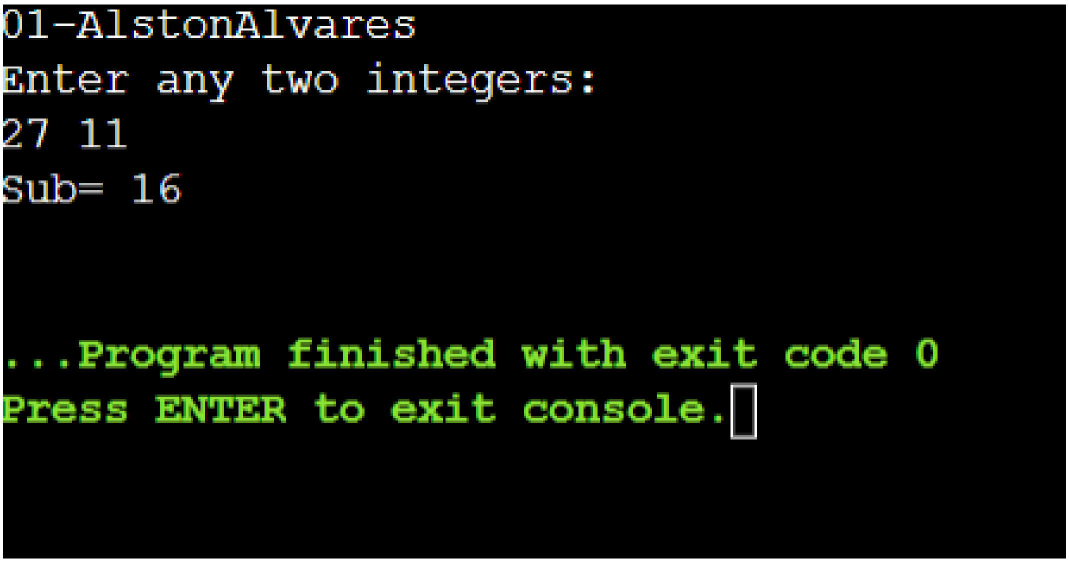
Output:

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.
```

Conclusion : Successfully performed a program to perform addition and subtraction using pointer.

Experiment no – 09(a)

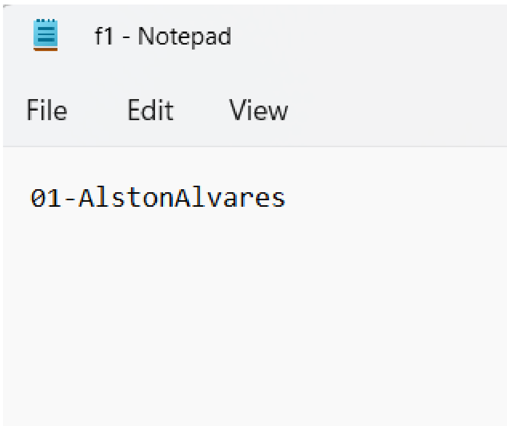
Aim: **Write a program to copy the contents of the file from one file into other.**

Algorithm:

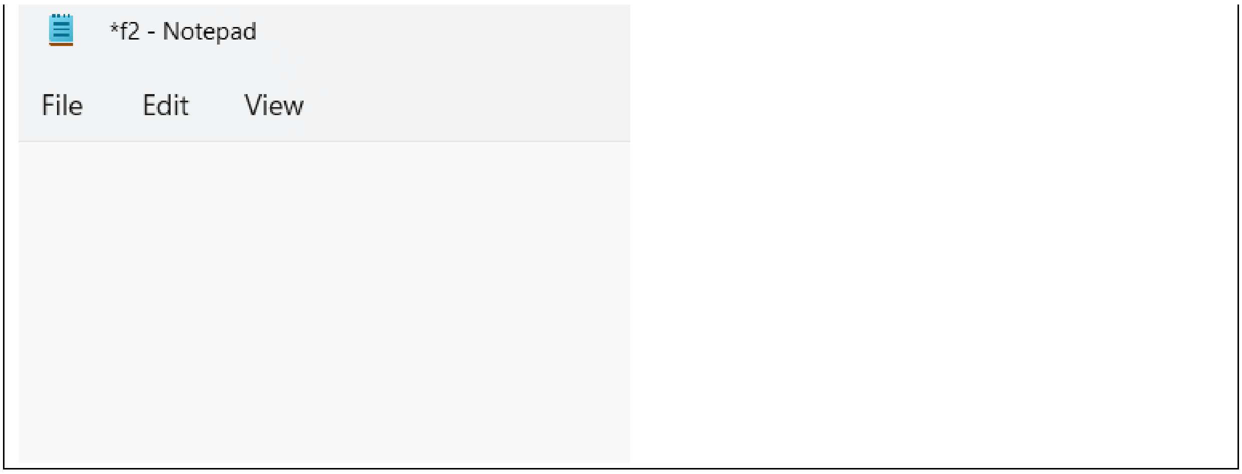
i. Start
ii. Create 2 files, f1 and f2
iii. Add text to f1
iv. Use getc, putc, FILE.
v. Open f2
vi. File f1's content has been copied to f2
vii. Stop

Code:

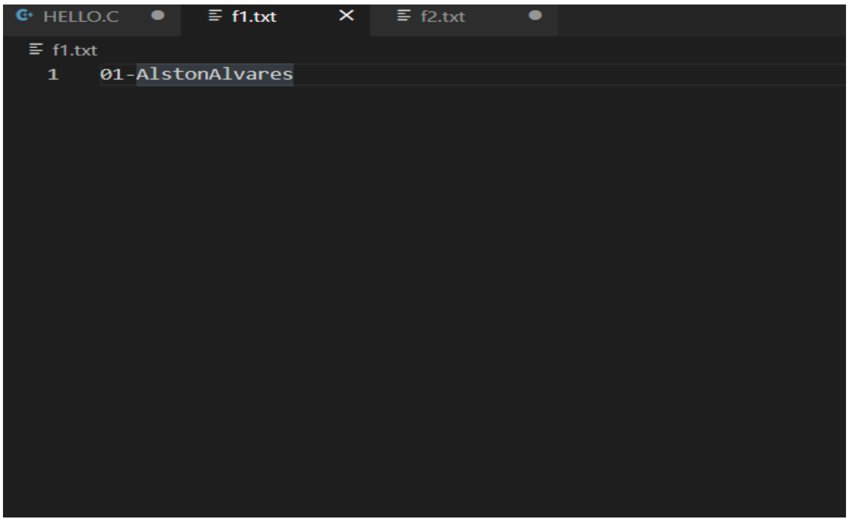
```
#include<stdio.h>
main()
{
   FILE *fp1, *fp2;
   char ch;
   fp1 = fopen("f1.txt", "r");
   fp2 = fopen("f2.txt", "w");
   while((ch = getc(fp1)) != EOF)
      putc(ch, fp2);
   fclose(fp1);
   fclose(fp2);
   getch();
}
```



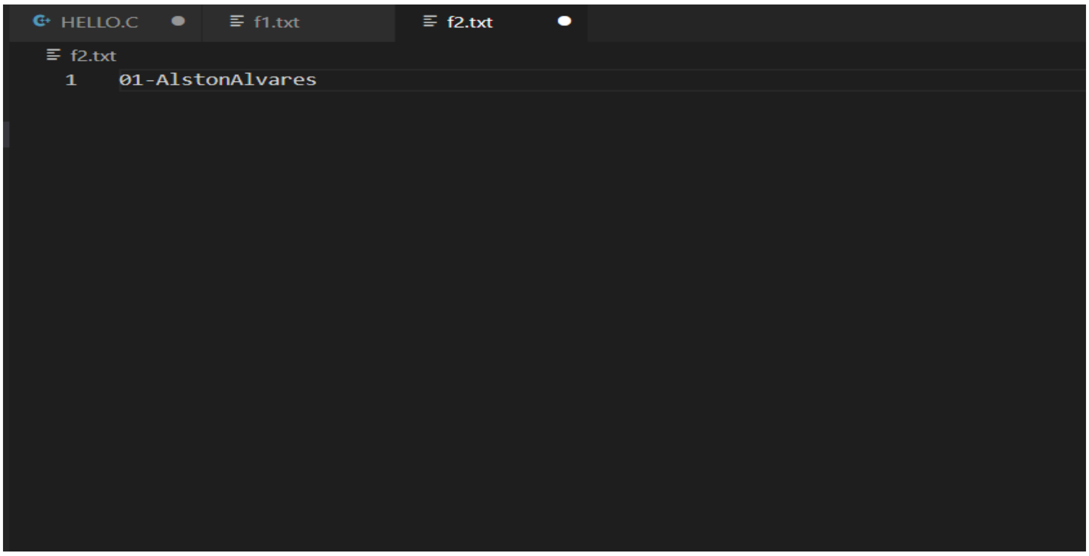
```
01-AlstonAlvares
```



Output:



```
01-AlstonAlvares
```



```
01-AlstonAlvares
```

Conclusion : Successfully performed a program to copy the contents of the file from one file into other.

Experiment no – 09(b)

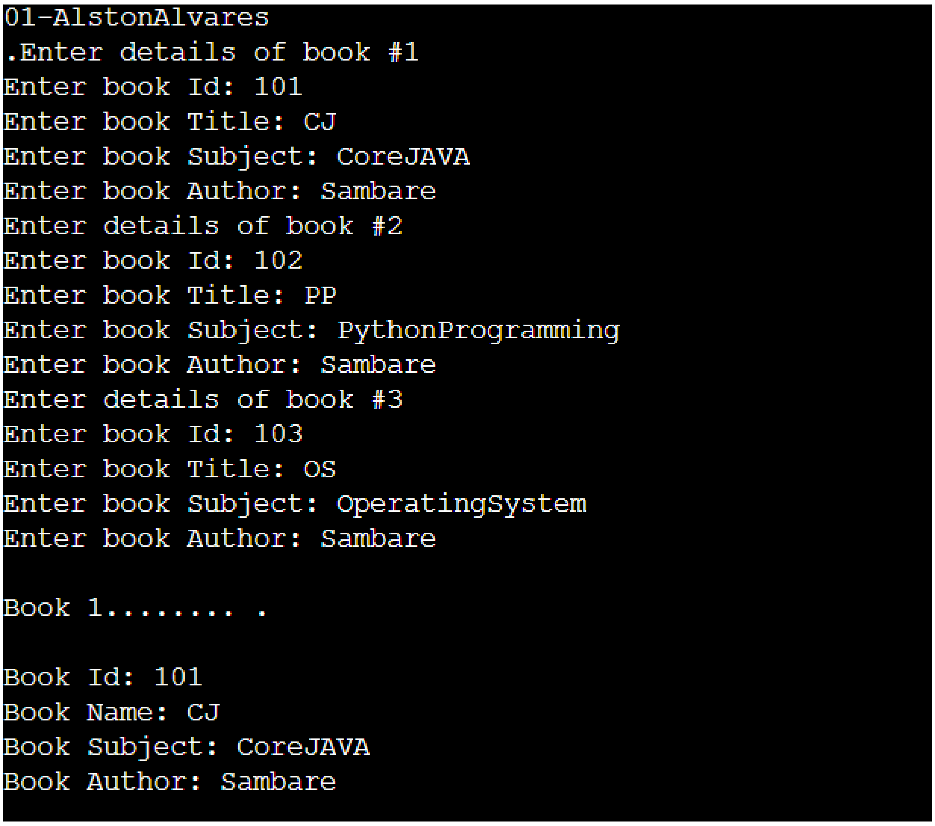
Aim: **Write a program to print the structure using**

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

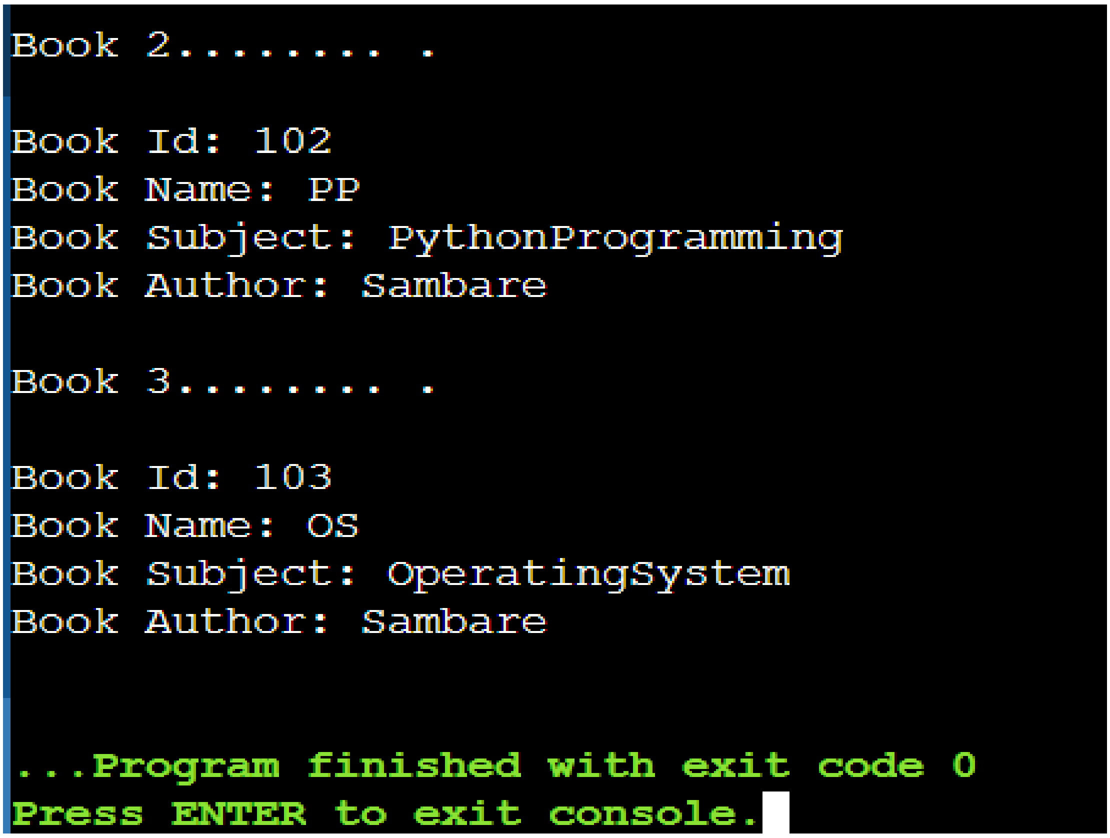
Code:

```
#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.
```

Conclusion : Successfully performed a program to print the details of two students.

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 I to deposit amount, Press 2 to withdraw amount, Press 0 to Exit.
vii. Stop

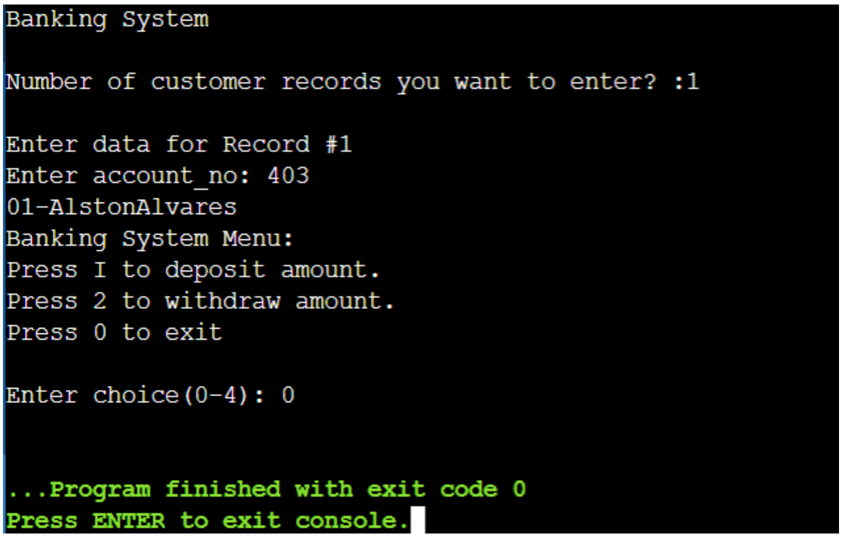
Code:

```
#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

{
```

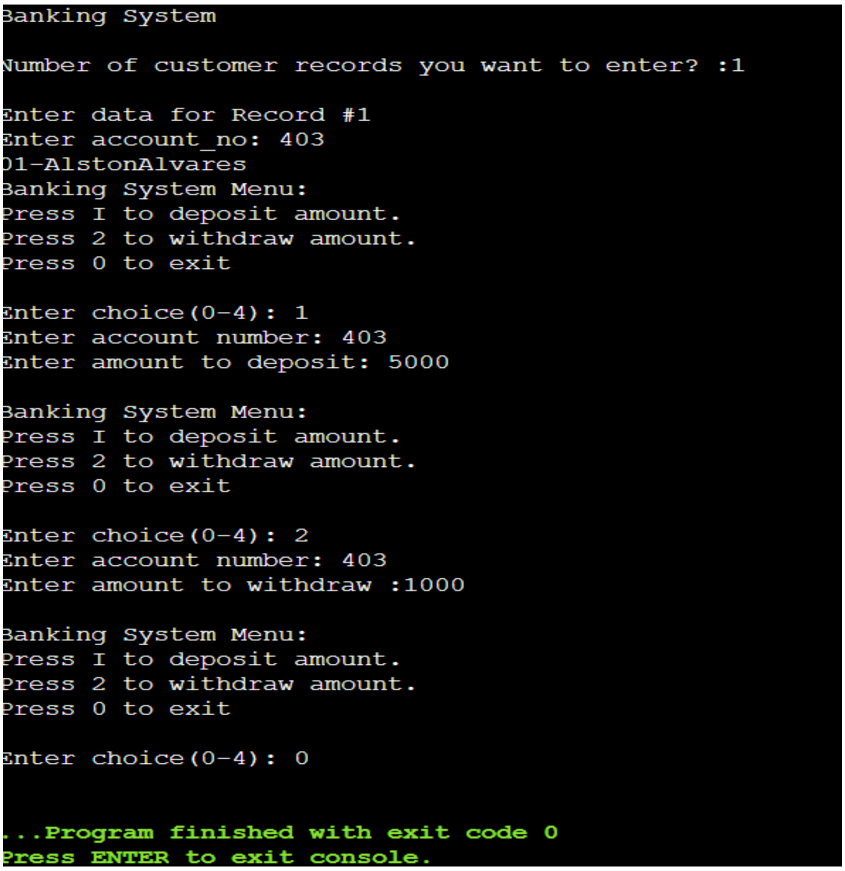
```
printf("\nBanking System Menu:\n");
printf("Press I to deposit amount.\n");
printf("Press 2 to withdraw amount.\n");
printf("Press 0 to exit\n");
printf("\nEnter choice(0-4): ");
scanf("%d", &choice);
switch (choice)
{


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 I 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 I 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 I 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 I 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.
```

Conclusion : Successfully performed a mini project on “Bank management system” . The program should be menu driven.