PROJECT REPORT (CSF101)

ON

MENU BASED PROGRAM

A report submitted in partial fulfilment of the requirement for the course

PROGRAMMING FOR PROBLEM SOLVING

Part of the degree of

BACHELOR OF TECHNOLOGY

In

CSE

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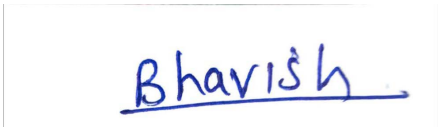
CANDIDATES DECLARATION

I hereby certify that the work, which is being presented in the Report, entitled **Menu Based Project**, in partial fulfilment of the requirement as part of the course Programming for Problem Solving of the Degree of **Bachelor of Technology** and submitted to the DIT University is an authentic record of my work carried out during the period ***9 jan 2021*** to ***14 jan 2021*** under the guidance of **Dr. Mitali Srivastava .**

Date: 14 jan 2021



Signature of the Candidates

ACKNOWLEDGEMENT

I take this opportunity with much pleasure to thank all the people who have helped me through the course of my journey towards producing this project. I sincerely thank my project guide, Dr. Mitali Srivastava, for her guidance, help and motivation. Apart from the subject of my research, I learnt a lot from her, which I am sure will be useful in different stages of my life I am especially grateful to my colleagues for their assistance, criticisms and useful insights. I am thankful to all the other B.Tech students of DIT UNIVERSITY with whom I share tons of fun memories. I would like to acknowledge the support and encouragement of my friends. My sincere gratitude also goes to all those who instructed and taught me through the years. Finally, this project would not have been possible without the confidence, endurance and support of my family. My family has always been a source of inspiration and encouragement. I wish to thank my parents, whose love, teachings and support have brought me this far.

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ABSTRACT

This is a mini project that helps users to find out the solution of problems based on Armstrong function, Fibonacci number, quadratic equation, Floyd and pascal triangle, value sin(x), and cos(x). Here, you can simply put the value and can find your answer, it shows whether a number is Armstrong function or not, shows Fibonacci series, shows the solution of quadratic equation, makes Floyd and pascal triangle, shows the value of sin(x) and cos(x) functions. With this project, we can perform the basic problems that we do in our day-to-day life. The entire project is implemented using the C programming language. The source code of this project is around 150 lines and included in this report. The majority of the task is implemented using functions and files. Files are used for storing the user information and the tasks are implemented through functions.

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Introduction

Introduction to C Programming Language

C is a general-purpose programming language that is extremely popular, simple and flexible. It is machine-independent, structured programming language which is used extensively in various applications.

C was the basic language to write everything from operating systems (Windows and many others) to complex programs like the Oracle database, Git, Python interpreter and more.

It is said that 'C' is a god's programming language. One can say, C is a base for the programming. If you know 'C,' you can easily grasp the knowledge of the other programming languages that uses the concept of 'C'

It is essential to have a background in computer memory mechanisms because it is an important aspect when dealing with the C programming language.

History

The base or father of programming languages is 'ALGOL.' It was first introduced in 1960. 'ALGOL' was used on a large basis in European countries. 'ALGOL' introduced the concept of structured programming to the developer community. In 1967, a new computer programming language was announced called as 'BCPL' which stands for Basic Combined Programming Language. BCPL was designed and developed by Martin Richards, especially for writing system software. This was the era of programming languages. Just after three years, in 1970 a new programming language called 'B' was introduced by Ken Thompson that contained multiple features of 'BCPL.' This programming language was created using UNIX operating system at AT&T and Bell Laboratories. Both the 'BCPL' and 'B' were system programming languages. Student Name SAP ID Branch Languages such as C++/Java are developed from 'C'. These languages are widely used in various technologies. Thus, 'C' forms a base for many other languages that are currently in use.

Uses of C Programming Language

1. C' language is widely used in embedded systems.

2. It is used for developing system applications.
3. It is widely used for developing desktop applications.
4. Most of the applications by Adobe are developed using 'C' programming language.
5. It is used for developing browsers and their extensions. Google's Chromium is built using 'C' programming language.
6. It is used to develop databases. MySQL is the most popular database software which is built using 'C'. 7. It is used in developing an operating system. Operating systems such as Apple's OS X, Microsoft's Windows, and Symbian are developed using 'C' language. It is used for developing desktop as well as mobile phone's operating system.
8. It is used for compiler production.
9. It is widely used in IOT applications.

How C program works?

C is a compiled language. A compiler is a special tool that compiles the program and converts it into the object file which is machine readable. After the compilation process, the linker will combine different object files and creates a single executable file to run the program. The following diagram shows the execution of a 'C' program Nowadays, various compilers are available online, and you can use any of those compilers. The functionality will never differ and most of the compilers will provide the features required to execute both 'C' and 'C++' programs.

Following is the list of popular compilers available online:

- Clang compiler Student Name SAP ID Branch
- MinGW compiler (Minimalist GNU for Windows)
- Portable 'C' compiler
- Turbo C

What is Menu based program

Menu-driven program: A program that obtains input from a user by displaying a list of options – the menu – from which the user indicates his/her choice. Systems running menu-driven programs are commonplace, ranging from icroprocessor controlled washing machines to bank cash dispensers. In the case of the cash dispenser, single keys are pressed to indicate the type of transaction (whether a receipt is wanted with the cash, or if a statement of the bank balance is required) and with many, a single key is pressed to indicate the amount of money required.

Menu-driven systems are advantageous in two ways: firstly, because input is via single key strokes, the system is less prone to user error; secondly, because only a limited range of characters are “allowed”, the way in which the input is to be entered is unambiguous. This contributes toward making the system more user-friendly.

About this program

This is a mini project that helps users to find out the problems based on Armstrong function, Fibonacci number, quadratic equation, Floyd and pascal triangle, value sin(x), and cos(x). Here, you can simply put the value and can find your answer, it shows whether a number is Armstrong function or not, shows Fibonacci series, shows the solution of quadratic equation, makes Floyd and pascal triangle, shows the value of sin(x) and cos(x) functions. With this project, we can perform the basic problems that we do in our day-to-day life. The entire project is implemented using the C programming language. The source code of this project is around 150 lines and included in this report. The majority of the task is implemented using functions and files. Files are used for storing the user information and the tasks are implemented through functions.

Function Description

The source code for user in Menu Based Project is relatively short and easy to understand. I have divided this C mini project into many functions, most of which are related to different Armstrong number. Listed below are some of the more important functions which may help you understand the project better.

Int fib(int q) – this function int(fib q) that returns Fq. For example, if q=0, then fib() should return 0 . if q=1, then it should return 1. For n>1 it should return fq-1 + fq-2.

Double quad(double a, double b, double c) – A quad double number is an unevaluated sum of four IEEE double precision numbers, capable of representing at least 212 bits pf signified. Algorithms for various arithmetic operations are presented.

Unsigned long int fact(int n) – The C++ language specification requires that a variable of type unsigned long int or in short , unsigned long is stored in at least 4 bytes and thus may hold a value at least in the range 0 to 4294967295.

Algorithm

```
#include <stdio.h>
#include <stdlib.h>
#include <math.h>
int fib(int q);
double quad(double a , double b ,double c );
unsigned long int fact(int n);
int main(void) {
  char c ; int m = 0 ;
  printf("NAME = BHAVISH\n");
  printf("Enter 1 for Armstrong Function \n");
  printf("Enter 2 for Computation of Fibonacci number using Recursive Function
\n");
  printf("Enter 3 for Finding Complete Solution of the Root of Quadratic Equation
Using function \n");
  printf("Enter 4 for Printing the Floyd And Pascal Triangle  \n");
  printf("Enter 5 for Computing The value of sin(x) and cos(x)  \n");
     scanf("%c", &c);
      switch(c)
      {
        case '1' :
        {
        int n ;
        int count = 0;
        int sum = 0;
        printf("ENTER THE NUMBER\n ");
        scanf("%d", &n);
        //Calculating Number Of Digit
        for(int i = n ; i>0 ; i= i/10)
        {
          count = count + 1 ;
        }
        int a = n;
        for(int i = 0 ; i<count ; i++)
        {
          int z = a%10;
          sum = sum+(z*z*z);
          a = a/10;
        }
        printf("sum %d\n",sum);
        if (sum==n)
        printf("It's a Armstrong Function\n");
        else
        printf("It's not a Armstrong Function");
```

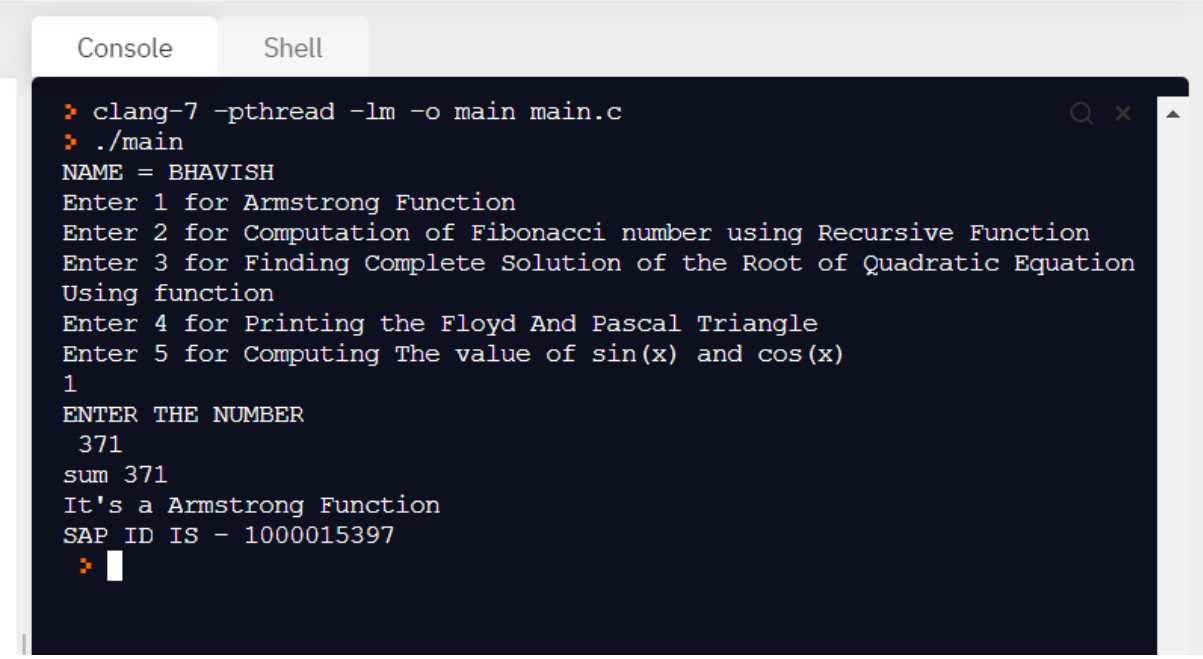
```
        break;
        }
        case '2' :
      {
            int q ;
            printf("Enter Value Of N Till Which Fibonacci Series is To be
calculated\n");
            scanf("%d",&q);
            for(int h = 1; h<= q; h++)
{
printf("%d\n", fib(m));
m++;
}
            break;
      }
            case '3' :
            {
printf("ENTER VALUE OF A , B, C\n");
double a ,b,c;
scanf("%lf",&a);
scanf("%lf",&b);
scanf("%lf",&c);
quad(a ,b ,c );
break;
}
            case '4' :
            {
              int e ;int r;
              printf("ENTER VALUE OF N TILL WHICH HEIGHT YOU WANT THE FLOYD
TRIANGLE\n");
              scanf("%d",&e);
              printf("     FLOYED TRIANGLE      \n");
              int p = 1;
              for(int i = 1 ; i<= e ; i++)
              {
                for(int j = 1 ; j<=i ; j++)
                {
                  printf("%d",p);
                  printf("  ");
                  p = p+1;
                }
                printf(" \n");
              }
              printf("    PASCAL TRIANGLE \n");
              {
```

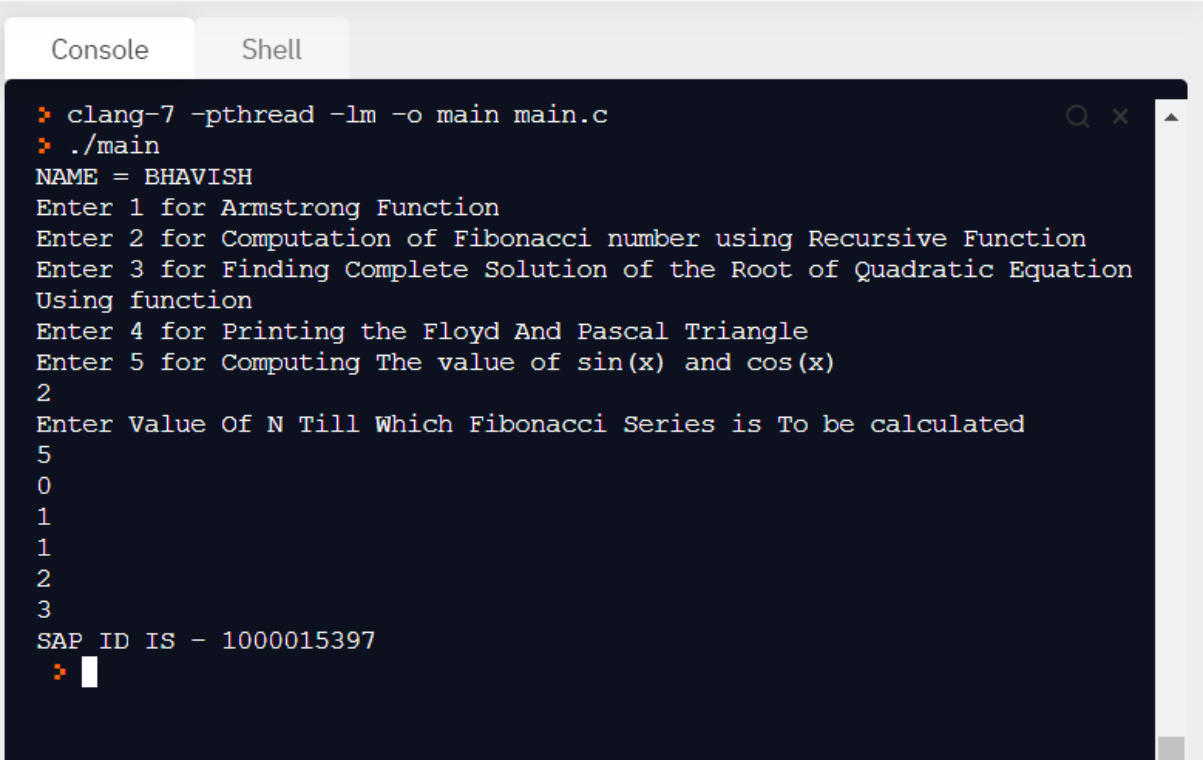
```
                int rows, coef = 1, space, i, j;
   printf("Enter the number of rows: ");
   scanf("%d", &rows);
   for (i = 0; i < rows; i++) {
      for (space = 1; space <= rows - i; space++)
         printf("  ");
      for (j = 0; j <= i; j++) {
         if (j == 0 || i == 0)
            coef = 1;
         else
            coef = coef * (i - j + 1) / j;
         printf("%4d", coef);
      }
      printf("\n");
   }
             }
               break ;
            }

       case '5':
       {
        {

int sign=1,x,i;

double sum=0,r;

printf("Enter the radian for SIN(X):\n");

scanf("%d",&x);

r=(x*3.14f)/180; /* Converting radius value */

for(i=1;i<=10;i+=2)

{

sum=sum+( (pow(r,i)/fact(i)) * sign );

sign= -sign;

}

printf("sin(%d) = %lf\n",x,sum);
```

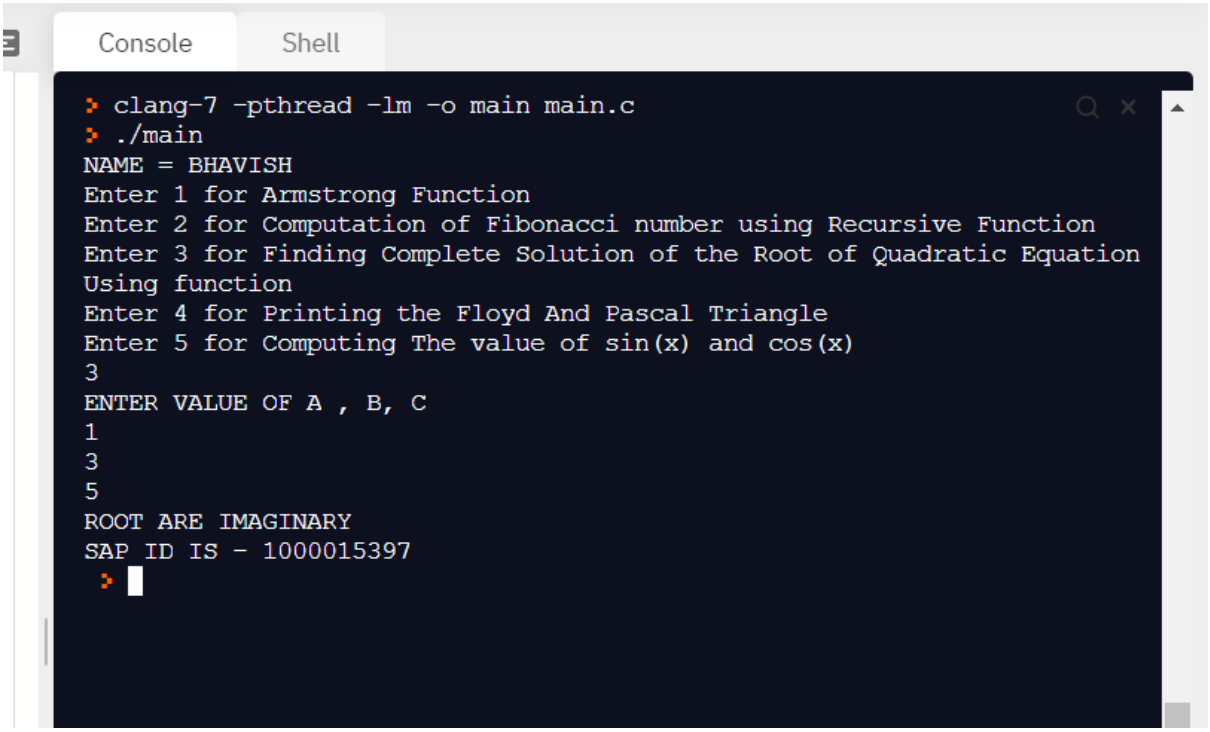
```
}
{
  int sign=1,x,i;

double sum=1,r;

printf("Enter the radian For COS(x) :\n");

scanf("%d",&x);

r=(x*3.14f)/180; /* Converting radius value */

for(i=2;i<=10;i+=2)

{

sign= -sign;

sum=sum+( (pow(r,i)/fact(i)) * sign );

}

printf("Cos(%d) = %lf\n", x,sum);

}
}
break;
       }

  printf("SAP ID IS - 1000015397\n ");
      }

 int fib(int q )
        {
          if(q==0)
          return q;
          else if (q==1)
          return q;
          else
          return (fib(q-1)+fib(q-2));
        }
        double quad(double a , double b ,double c )
        {
          double d = ((b*b)-(4*a*c));
          double d1 = sqrt(d);
```

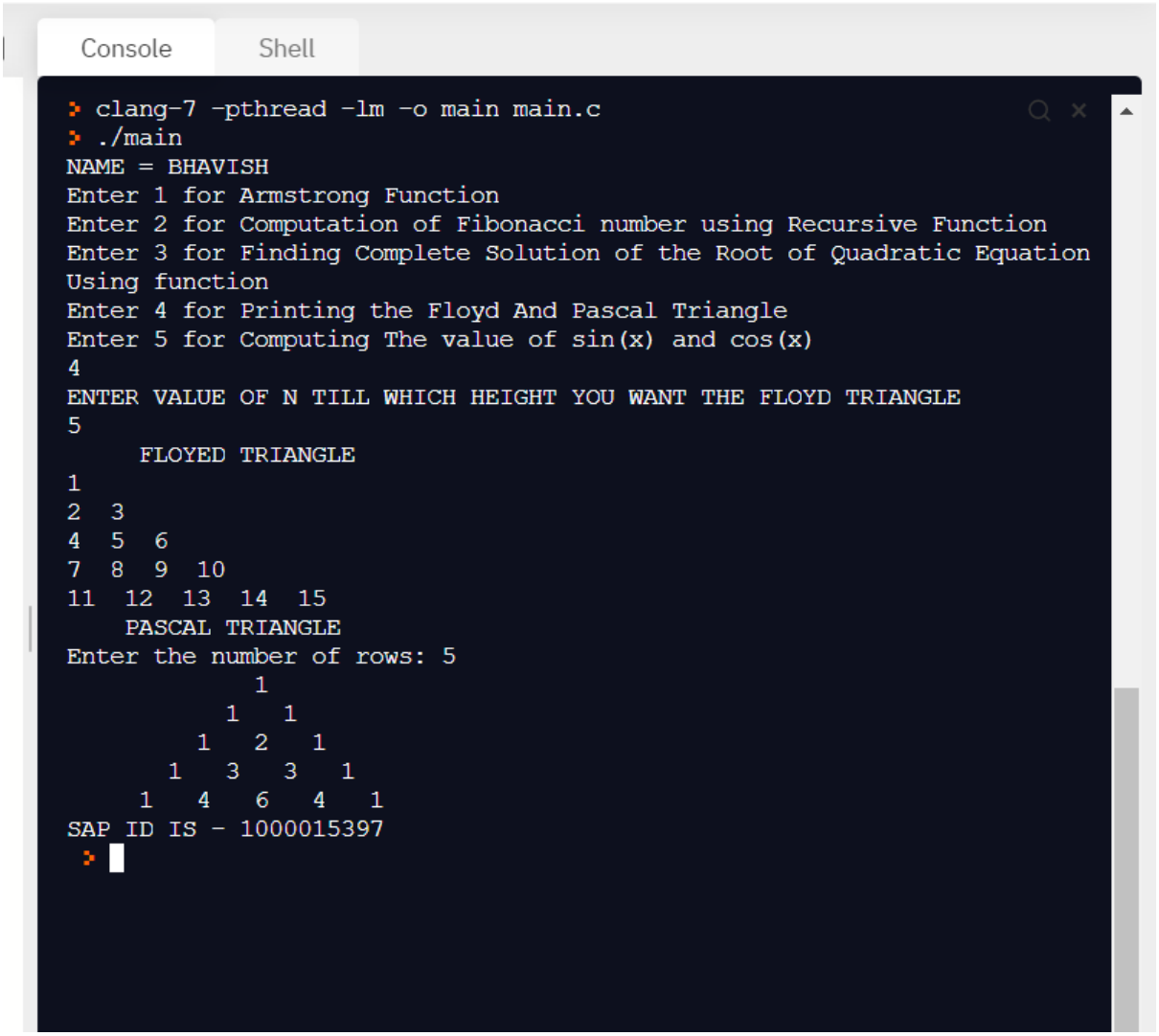
```
            if (d==0)
            {
              double r = ((b)/(2*a));
              printf("THE ROOTS ARE REAL & ROOT ARE %lf \n" , r);
              return 0;
            }
            else if (d>0)
            {
              double r1 =(((-b)+d1)/(2*a));
              double r2 =(((-b)-d1)/(2*a));
              printf("THE ROOT  ARE %lf\n %lf\n",r1,r2);
              return 0;
            }
            else
            {
              printf("ROOT ARE IMAGINARY \n");
              return 0 ;
            }
          }
          unsigned long int fact(int n)
{
unsigned long int f=1;
int i;
for(i=1;i<=n;i++)
{
f=f*i;
}
return f;
}
```

Implementation and Screen Shots






Console
Shell
clang-7 -pthread -lm -o main main.c
./main
NAME = BHAVISH
Enter 1 for Armstrong Function
Enter 2 for Computation of Fibonacci number using Recursive Function
Enter 3 for Finding Complete Solution of the Root of Quadratic Equation
Using function
Enter 4 for Printing the Floyd And Pascal Triangle
Enter 5 for Computing The value of sin(x) and cos(x)
3
ENTER VALUE OF A , B, C
1
3
5
ROOT ARE IMAGINARY
SAP ID IS - 1000015397



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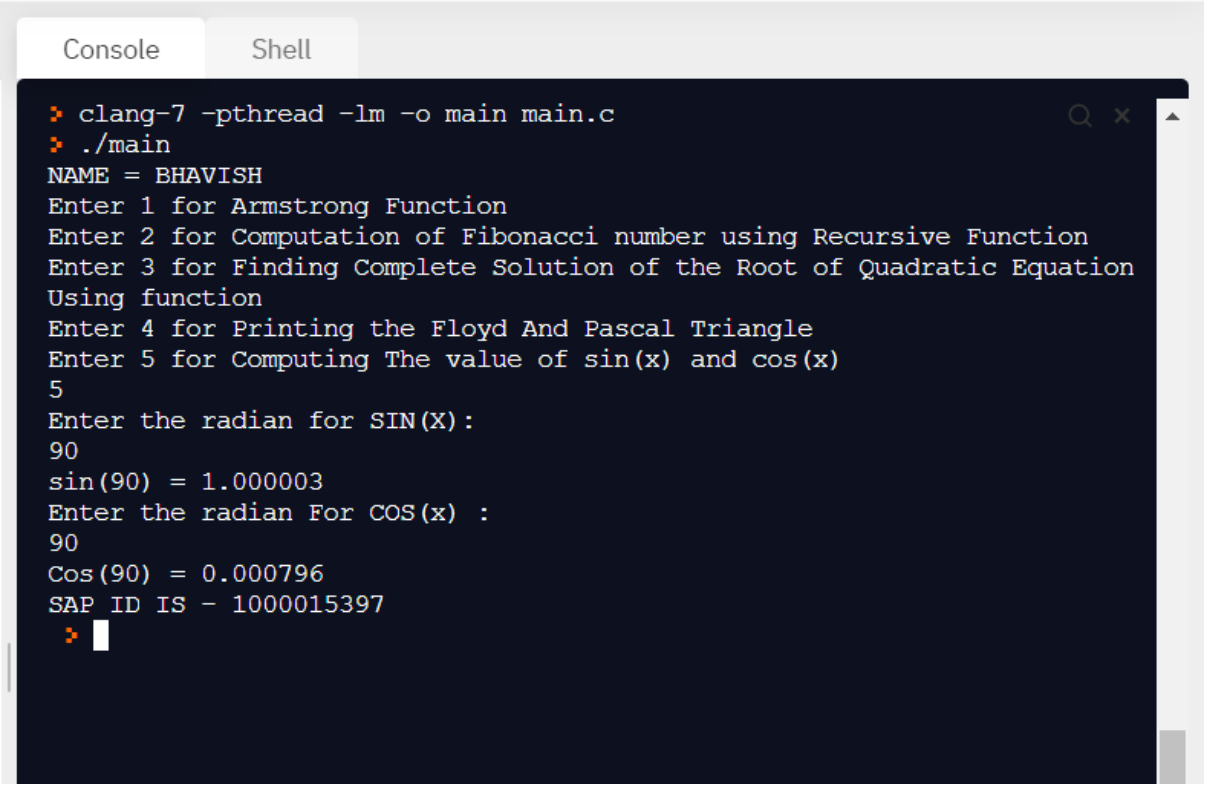
Console
Shell
clang-7 -pthread -lm -o main main.c
./main
NAME = BHAVISH
Enter 1 for Armstrong Function
Enter 2 for Computation of Fibonacci number using Recursive Function
Enter 3 for Finding Complete Solution of the Root of Quadratic Equation
Using function
Enter 4 for Printing the Floyd And Pascal Triangle
Enter 5 for Computing The value of sin(x) and cos(x)
5
Enter the radian for SIN(X):
90
sin(90) = 1.000003
Enter the radian For COS(x) :
90
Cos(90) = 0.000796
SAP ID IS - 1000015397

Conclusion

The menu based program is successful. Source code and algorithm of all questions are correct without having any error or warning that's why output values of all the inputs are correct.

References

Encyclopedia:
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Google scholar:
https://scholar.google.com/