PROGRAMMING BASICS

Brief

The is to learn the basics of programming using C language and Python and implement simple logics to understand the syntax and working.
C is based on **Procedural** programming while Python is based in **Object Oriented** programming. Syntax is easier on Python.

Learning:

- Header files include the standard function declaration and definition like printf, scanf etc.
- Different ways to read the input from user and display output to user.
- Using mathematical operations of set of numbers.
- Tackling syntax and logical errors.

Program 1: Write a program to take two integers "num1" and "num2" as inputs from the user and print their sum.

C :

```c
#include <stdio.h>

int main()
{
   /* creating variables num1, num2, sum */
   int num1, num2;
   int sum;
   printf("Please enter first number:\n");
   /* read first number from user*/
   scanf("%d", &num1);
   printf("Please enter second number:\n");
   /* read second number from user*/
   scanf("%d", &num2);
  /* add both numbers and print the result*/
   printf("The sum of the two numbers is %d", sum = num1 + num2);

   return 0;
}
```

Python:

```
num1 = int(input("Please enter first number:\n "))
num2 = int(input("Please enter first number:\n"))

sum = num1 + num2

print("The sum of the two numbers is :", sum)
```

Program 2: Write a program to take an integer "n" as input and print if it is "odd" or "even".

C :

```c
#include <stdio.h>

int main()
{
   int n;
   printf("Please enter a number:\n");
   /* read the number from user*/
   scanf("%d", &n1);
   /* use modulus operator to to get the remainder when divided by 2. The remainder would be zero if the number is even, remainder would be 1 if the number is odd*/
   if( n % 2 == 0)
   {
      printf("The entered number is even");
   }
   else
   {
      printf("The entered number is odd");
   }

   return 0;
}
```

Python:

```
i = 1;
n = input("Enter a number: ")
''' Here we check if the instance of the variable is
number or not'''
if(isinstance(n, int)):
    ''' check if the number is divisible by 2 or not'''
    if (n % 2) == 0:
        print("The entered number is even")
    else:
        print("The entered number is Odd")
else:
    print("The entered value is not a number")
```

Program 3: Write a program to take an integer "n" as input from the user and print its factorial.

C:

```c
#include <stdio.h>

/* factorial function is recursive function which take an integer, calls itself repeatedly and performs the factorial operation and returns the result*/
int factorial(int n)
{
    int fact = 1;
    /* condition to check if the number is not equal to zero*/
    if (n!=0)
    {
        fact = n * factorial(n-1);
    }
   /* once the number goes below zero, recursion stops and the value is returned*/
    return fact;
}
```

```c
int main()
{
    int n;
    printf("Please enter a number:\n");
    scanf("%d", &n1);
    /* call the factorial function by passing the number. The result returned will be stored in fact variable.*/
    fact = factorial(n);
    printf("The factorial of the number is :%d", fact);
    }

    return 0;
}
```

Program 3: Write a program to take an integer "n" as input from the user and print its factorial.

Python:

```
''' Factorial recursion function to calculate
the factorial'''
def factorial(n):
    if n == 1:
        return n
    else:
        return n * factorial(n - 1)
num = int(input("Please enter a positive number: "))
if num < 0:
    print("Factorial cannot be found for negative numbers")
elif num == 0:
    print("Factorial of 0 is 1")
else:
    '''call to recurssive function'''
    print("The factorial of the number is ", factorial(num))
```