

Project on :

NUMBER SYSTEM CONVERTER

Subject : Python Programming

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Introduction to the Project:

This is a project based on concept of digital logic and micro-processor. This is a program based on number system conversion.

A number system is defined as a system of writing to express numbers. It is the mathematical notation for representing numbers of a given set by using digits or other symbols in a consistent manner. It provides a unique representation of every number and represents the arithmetic and algebraic structure of the figures. It also allows us to operate arithmetic operations like addition, subtraction, multiplication and division.

There are various types of number systems in mathematics. The four most common number system types are:

1. Decimal number system (Base- 10)
2. Binary number system (Base- 2)
3. Octal number system (Base-8)
4. Hexadecimal number system (Base- 16)

Aim of this project is to convert the numbers from one form to another. Though this program we do a lot of things like :-

1. Convert binary number to decimal, octal , hexadecimal number.
2. Convert Decimal number to binary, octal , hexadecimal number.
3. Convert octal number to decimal, binary , hexadecimal number.
4. Convert hexadecimal number to decimal, octal , binary number.

Problem Statement:

Write a Program to convert numbers according to number system. Program converts :-

1. Binary number to decimal, octal , hexadecimal number.
2. Decimal number to binary, octal , hexadecimal number.
3. Octal number to decimal, binary , hexadecimal number.
4. Hexadecimal number to decimal, octal , binary number.

Requirement :

1. Software Used :-
 - Python idle- version 3.11.1
 - Visual Studio code
 - Py-charm
2. Components used :-
 - If loop

Current Status of program:

Currently this project can do a lot of things like :-

1. This program take number as a input from the user in a variable named 'n'.
2. Person can select how to convert the number given by him.
3. We can know binary ,decimal ,octal ,hexadecimal form of the given number.
4. Also we can select a form of number i.e binary , decimal ,octal ,hexadecimal this is taken as input.

I am currently working on number in decimal form. That is we can convert integer and decimal into different form of number system.

Limitation:

There are few limitations of this project like –

1. This project is not able to convert decimal number into any form in number system.
2. Also it not support greatest numbers.

Limitation:

```
print("##Number System Conversion##")

print("1: Binary to decimal,octal,hexadecimal")
print("2: Decimal to binary,octal,hexadecimal")
print("3: Octal to binary,decimal,hexadecimal")
print("4: Hexadecimal to binary,decimal,octal")
num = int(input("Select operation you want to perform :"))

if num==2:
    print("5: Decimal to Binary")
    print("6: Decimal to Hexadecimal")
    print("7: Decimal to Octal")
    num1 = int(input("Select Operation You want To Perform:"))
    n = int(input("Enter Number:"))
    # Decimal to binary
    if num1 == 5:
        l = list()
        while n != 0:
            r = n % 2
            l.append(r)
            n = n//2 # this is used to round up to near whole
        l.reverse()
        print("The Binary Form of given number is ")
        for ele in l:
            print(ele, end="")

    # Decimal to Hexadecimal
    if num1 == 6:
        def f_decToHex(n):
            return hex(n)
        v_hex = f_decToHex(n)
        print("Hexadecimal form of given number is ",format(v_hex[2:]))

    # Decimal to Octal
    if num1==7:
        temp = n
        i=1
        sum=0
        while temp != 0:
            rem = int(temp % 8)
            rem = int(temp % 8)
            sum = sum + i * rem
            i = i * 10
            temp = temp/8
        print("Octal Number =" , sum)

if num==1:
    print("5: Binary to decimal")
    print("6: binary to hexadecimal")
    print("7: Decimal to Octal")
    num1 = int(input("Select Operation You want To Perform:"))
```

```

n = input("Enter Number:")
if num1==5:
    decimal_num = int(n, 2)
    print(f"Decimal: {decimal_num}")
if num1==6:
    hexadecimal_num = hex(n)
    print(f"Decimal: {hexadecimal_num}")
if num1==7:
    octal_num = oct(n)
    print(f"Decimal: {octal_num}")

if num==3:
    print("5: octal to decimal")
    print("6: octal to decimal")
    print("7: octal to hexadecimal")
    num1 = int(input("Select Operation You want To Perform:"))
    n = input("Enter Number:")
    if num1==5:
        decimal_num = int(n, 8)
        print(f"Decimal: {decimal_num}")
    if num1==6:
        binary_num = bin(n)
        print(f"Decimal: {binary_num}")
    if num1==7:
        hexadecimal_num = hex(n)
        print(f"Decimal: {hexadecimal_num}")

if num==4:
    print("5: hexadecimal to decimal")
    print("6: hexadecimal to binary")
    print("7: hexadecimal to octal")
    num1 = int(input("Select Operation You want To Perform:"))
    n = input("Enter Number:")
    if num1==5:
        decimal_num = int(n, 16)
        print(f"Decimal: {decimal_num}")
    if num1==6:
        binary_num = bin(n)
        print(f"Decimal: {binary_num}")
    if num1==7:
        octal_num = oct(n)
        print(f"Decimal: {octal_num}")

```