

WEEK – 3

Q1. Write a program to Convert a binary number taken as user input into its decimal equivalent.

User Input: 101010 Output: 42

CODE:

```
binary = input("Enter binary of a number: ")
num = int(binary, 2)
print("Number is:", num)
```

OUTPUT:

```
Enter binary of a number: 101010
Number is: 42
```

Q2. Write the python code and using Recursion/Iterations solve the problem stated in program 1.

CODE:

```
binary = input("Enter binary of a number: ")
num = 0
index = 0
for i in binary[::-1]:
    num += int(i) * (2**index)
    index += 1
print("Number is:", num)
```

OUTPUT:

```
Enter binary of a number: 101010
Number is: 42
```

Q3. Given the decimal number 168, represent it using octal and hexadecimal literals.

CODE:

```
decimal_number = int(input("Enter a number: "))
octal_rep = oct(decimal_number)
hexad_rep = hex(decimal_number)

print("Octal of number:", octal_rep)
print("Hexadecimal of number:", hexad_rep)
```

OUTPUT:

```
Enter a number: 168
Octal of number: 0o250
Hexadecimal of number: 0xa8
```

Q4. Write a python program (to implement the concept of function overloading) having 1 function 'calculate price' that calculates the final price of an item after applying the discount. If only the original price is provided by the user, calculate the price after applying 10 % discount. If the original price and a discount percentage are provided by the user, calculate the price after applying the provided Discount.

CODE:

```
def calculate_price(orig, disc=10):
    return orig*(100-disc)/100

orig = float(input("Enter the original price of the item: "))
option = input("Do you want to provide a custom discount percentage? (yes/no): ").strip().lower()

if option == 'yes':
    discount_percentage = float(input("Enter the discount percentage: "))
    final_price = calculate_price(orig, discount_percentage)
else:
    final_price = calculate_price(orig)

print(f"The final price after applying the discount is: {final_price:.2f}")
```

OUTPUT:

```
Enter the original price of the item: 299
Do you want to provide a custom discount percentage? (yes/no): no
The final price after applying the discount is: 269.10
```

Q5. Write a python program that takes a floating-point value as input from the user and outputs the binary equivalent of that number (up to 10 digits). For example: Input: 2.2, Output: 10.00110011000

CODE:

```
def float_to_binary(num, precision=10):
    integer_part = int(num)
    fractional_part = num - integer_part
    integer_binary = bin(integer_part).replace("0b", "")

    fractional_binary = ""
    while fractional_part and len(fractional_binary) < precision:
        fractional_part *= 2
        bit = int(fractional_part)
        if bit == 1:
            fractional_binary += '1'
            fractional_part -= bit
        else:
            fractional_binary += '0'

    binary_representation = integer_binary + "." + ''.join(fractional_binary)
    return binary_representation

user_input = float(input("Enter a floating-point number: "))

binary_output = float_to_binary(user_input)
print(f"Binary equivalent: {binary_output}")
```

OUTPUT:

```
Enter a floating-point number: 2.2
Binary equivalent: 10.00110011000
```