A

PRACTICAL ASSIGNMENT

OF

"MCA 206 - Programming in Python"

Submitted in partial fulfillment of the requirements for the

Master of Computer Applications
MCA - IInd semester

From

PT. RAVISHANKAR SHUKLA UNIVERSITY SCHOOL OF STUDIES, RAIPUR(C.G)

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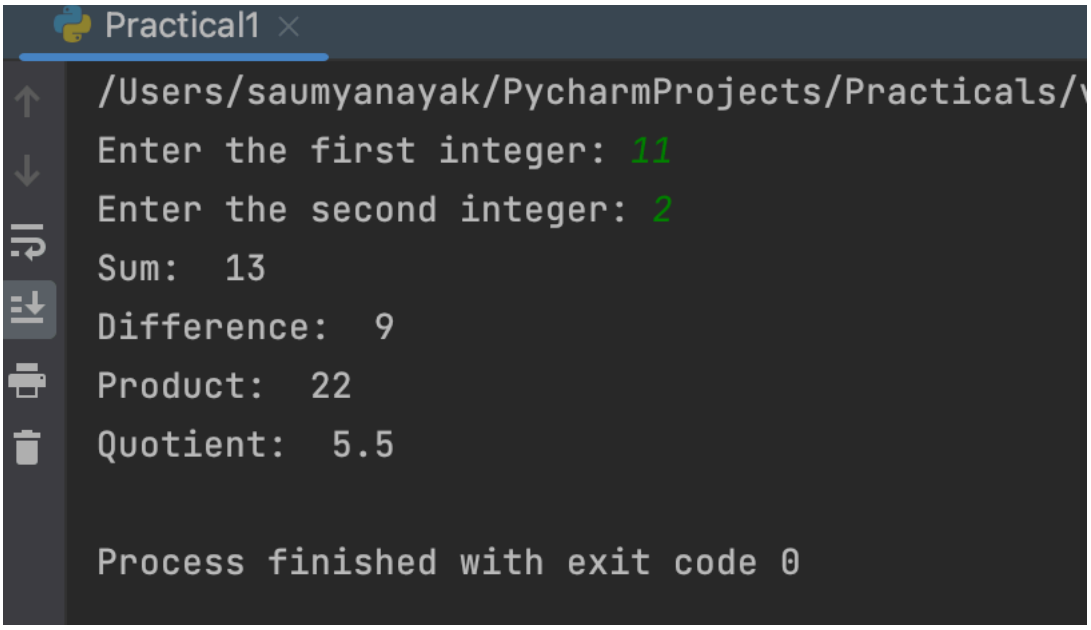
Practical No. 1

Program : Write a Python program to perform arithmetic operations on integers.

Code Section :

```
# Ask the user to input two integers
num1 = int(input("Enter the first integer: "))
num2 = int(input("Enter the second integer: "))

# Perform arithmetic operations
sum = num1 + num2
difference = num1 - num2
product = num1 * num2
quotient = num1 / num2

# Print the results
print("Sum: ", sum)
print("Difference: ", difference)
print("Product: ", product)
print("Quotient: ", quotient)
```

Output Section :



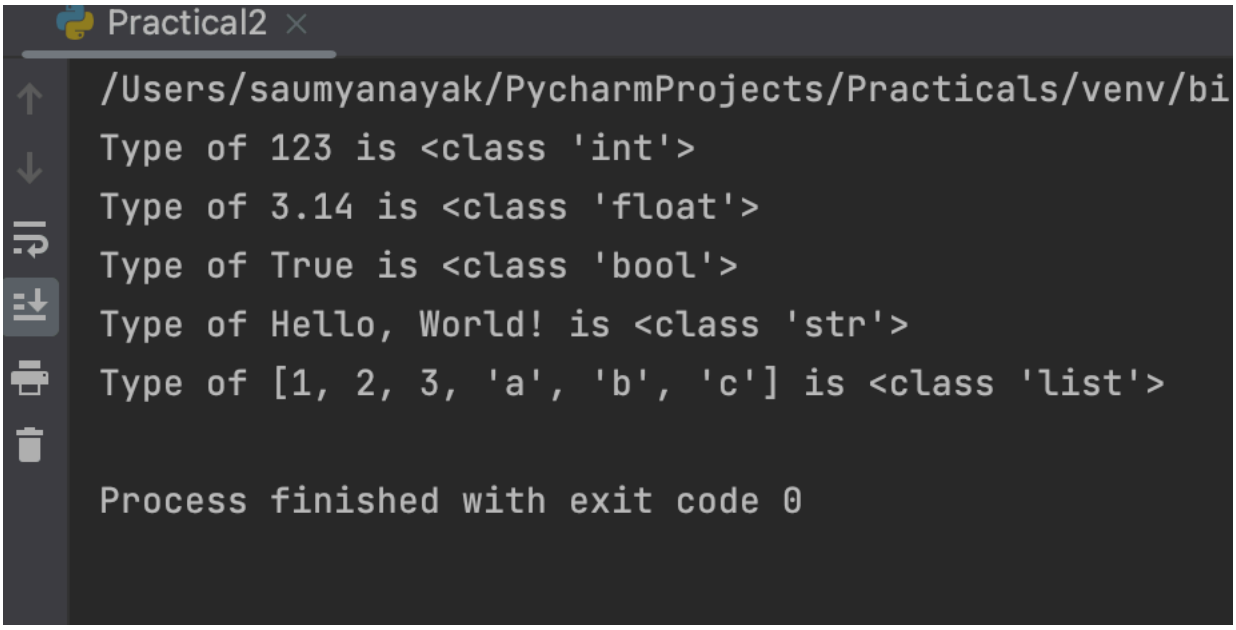
Practical No. 2

Program : Write a Python program to check and print the types of at least 5 different in- built objects.

Code Section :

```
# Check and print the types of different built-in objects


# Integer

num = 123

print("Type of", num, "is", type(num))


# Floating-point number

float_num = 3.14

print("Type of", float_num, "is", type(float_num))


# Boolean

is_true = True

print("Type of", is_true, "is", type(is_true))


# String

text = "Hello, World!"

print("Type of", text, "is", type(text))


# List

my_list = [1, 2, 3, "a", "b", "c"]

print("Type of", my_list, "is", type(my_list))
```

Output Section :



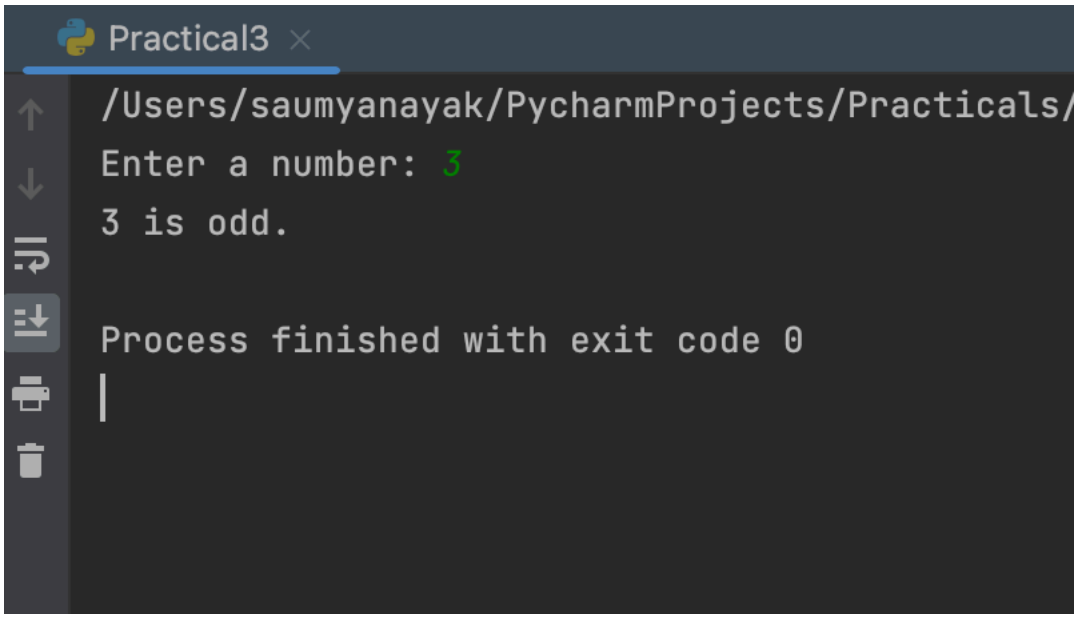
Practical No. 3

Program : Write a Python program to check if a number is EVEN or ODD.

Code Section :

```
# Ask the user to input a number
num = int(input("Enter a number: "))


# Check if the number is even or odd
if num % 2 == 0:
    print(num, "is even.")
else:
    print(num, "is odd.")
```

Output Section :



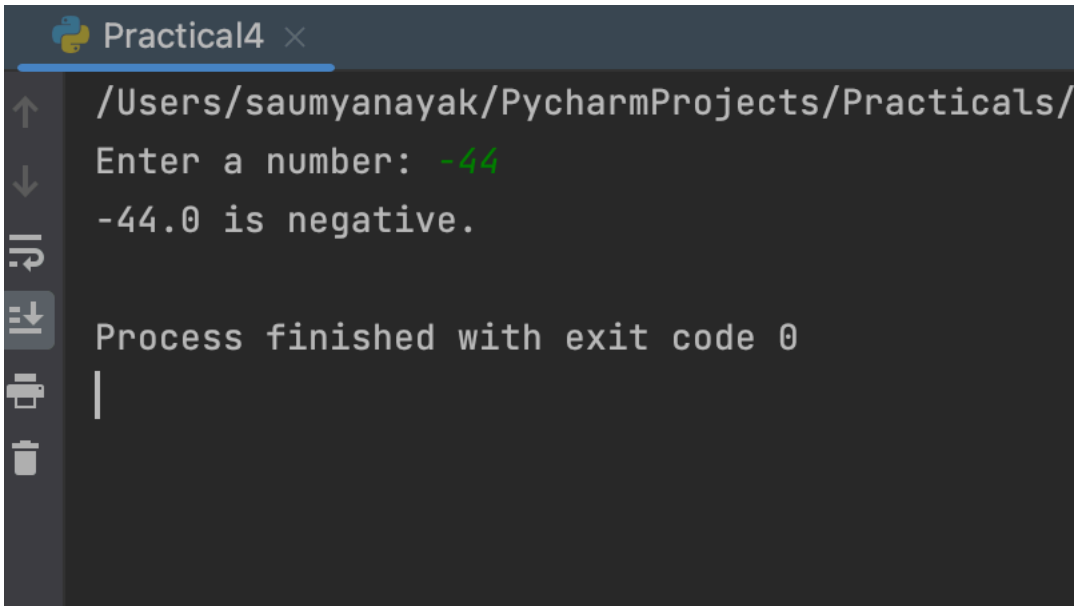
Practical No. 4

Program : Write a Python program to check if a number is Positive, Negative or Zero.

Code Section :

```
# Ask the user to input a number

num = float(input("Enter a number: "))


# Check if the number is positive, negative, or zero

if num > 0:

    print(num, "is positive.")

elif num < 0:

    print(num, "is negative.")

else:

    print(num, "is zero.")
```

Output Section :



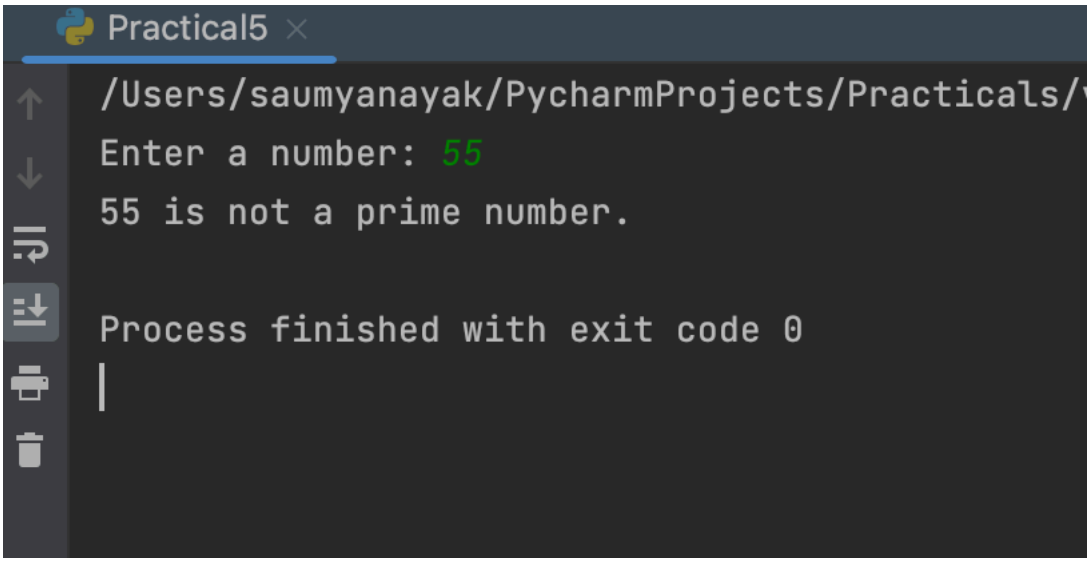
Practical No. 5

Program : Write a Python program to check if a number is PRIME or NOT.

Code Section :

```
# Ask the user to input a number
num = int(input("Enter a number: "))


# Check if the number is prime
if num > 1:
   # check for factors
   for i in range(2, num):
      if num % i == 0:
         print(num, "is not a prime number.")
         break
   else:
      print(num, "is a prime number.")
else:
   print(num, "is not a prime number.")
```

Output Section :



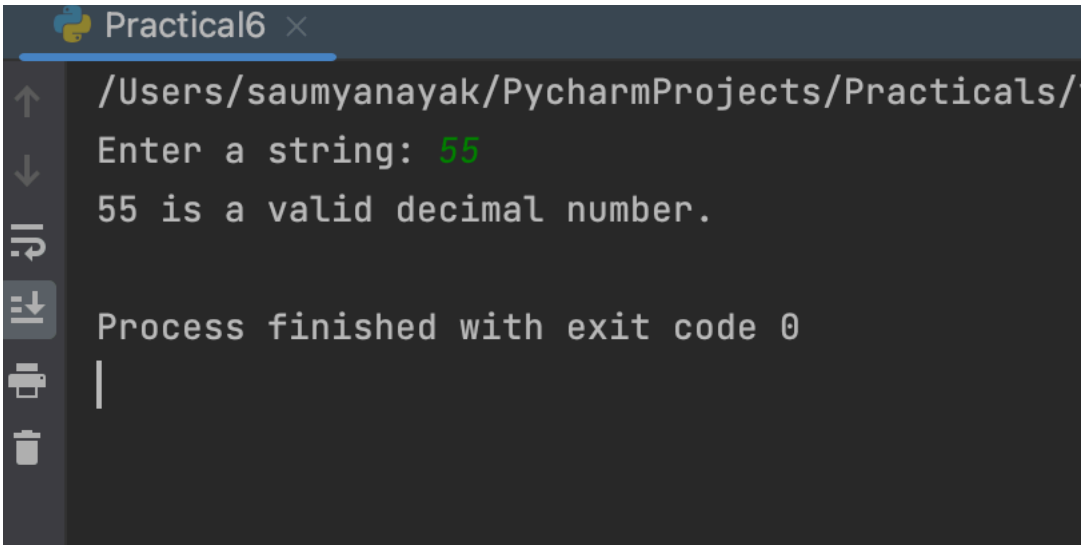
Practical No. 6

Program : Write a Python program to check whether a string entered by the user is a valid decimal number or not.

Code Section :

```
# Ask the user to input a string

str = input("Enter a string: ")


# Try to convert the string to a float

try:

    num = float(str)

    print(str, "is a valid decimal number.")

except ValueError:

    print(str, "is not a valid decimal number.")
```

Output Section :



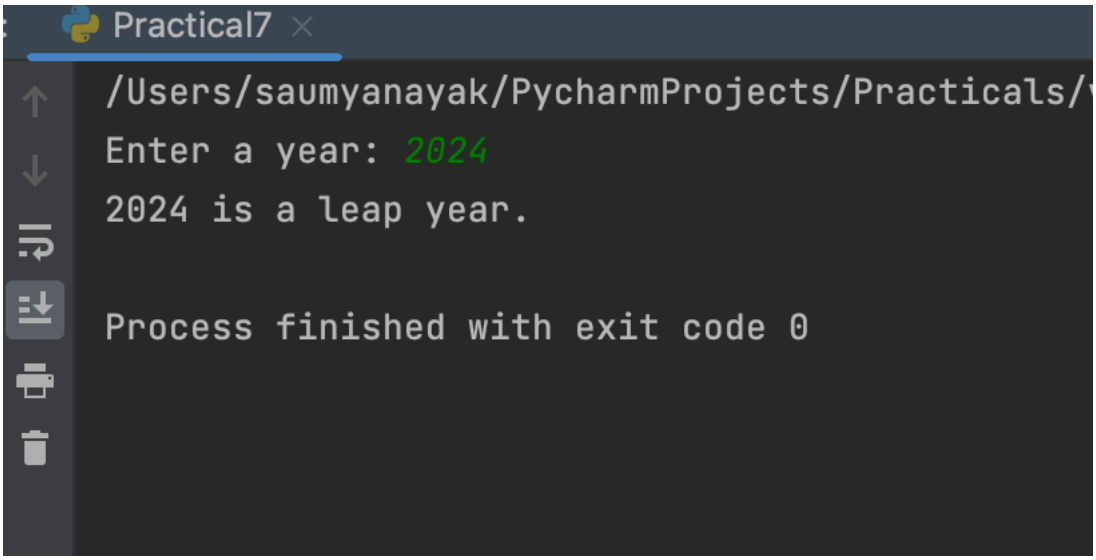
Practical No. 7

Program : Write a Python program to check if a year entered by the user is a Leap Year or NOT.

Code Section :

```
# Ask the user to input a year

year = int(input("Enter a year: "))


# Check if the year is a leap year

if (year % 4 == 0 and year % 100 != 0) or (year % 400 == 0):

    print(year, "is a leap year.")

else:

    print(year, "is not a leap year.")
```

Output Section :



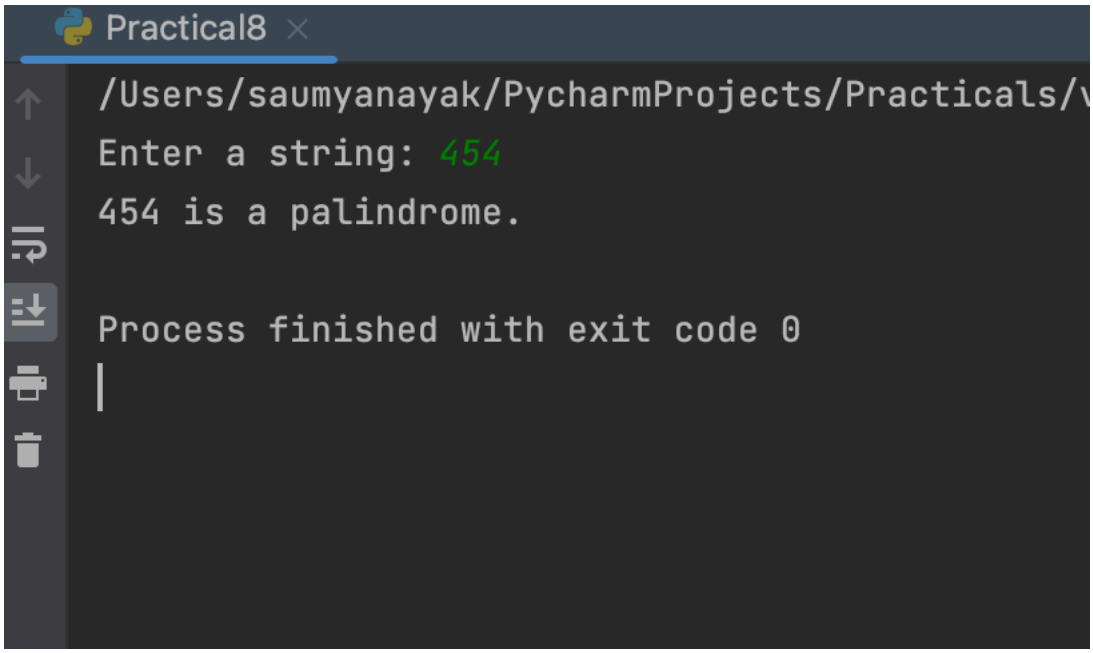
Practical No. 8

Program : Write a Python program to check whether a string entered by the user is a palindrome or not.

Code Section :

```
# Ask the user to input a string

str = input("Enter a string: ")


# Reverse the string

rev_str = str[::-1]


# Check if the string is a palindrome

if str == rev_str:

    print(str, "is a palindrome.")

else:

    print(str, "is not a palindrome.")
```

Output Section :



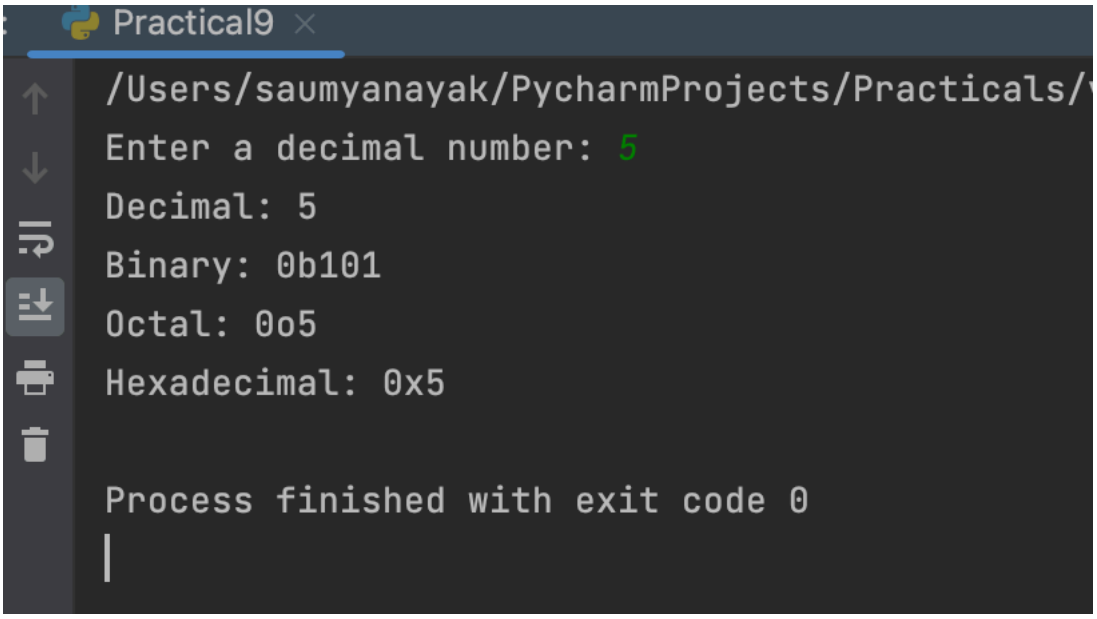
Practical No. 9

Program : Write a Python program to get a Decimal number from user and convert it into Binary, Octal and Hexadecimal.

Code Section :

```
# Ask the user to input a decimal number

decimal = int(input("Enter a decimal number: "))


# Convert the decimal number to binary, octal, and hexadecimal

binary = bin(decimal)

octal = oct(decimal)

hexadecimal = hex(decimal)


# Print the result

print("Decimal:", decimal)

print("Binary:", binary)

print("Octal:", octal)

print("Hexadecimal:", hexadecimal)
```

Output Section :



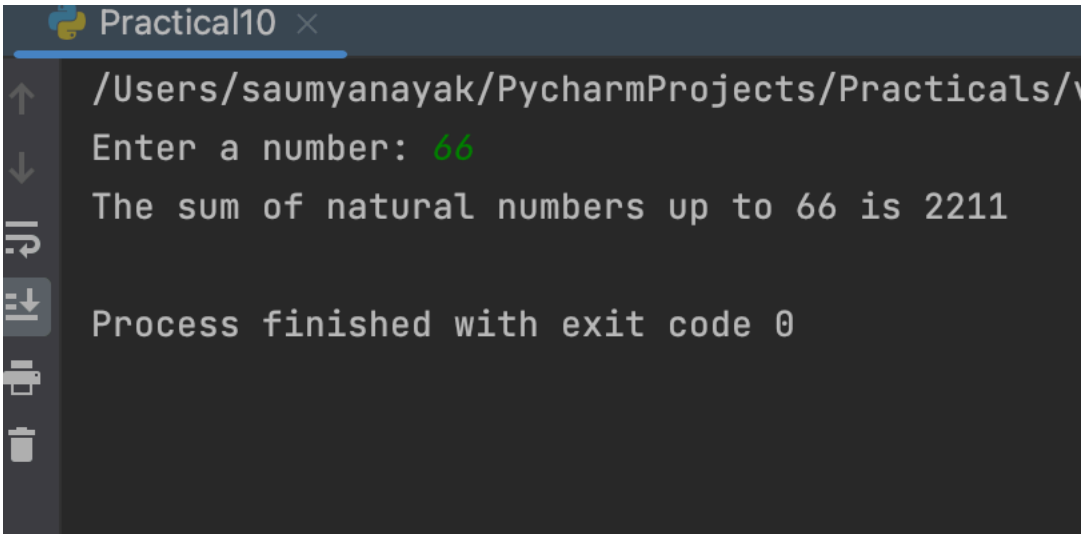
Practical No. 10

Program : Write a Python program to find sum of natural numbers, up to N.

Code Section :

```
# Ask the user to input a number
N = int(input("Enter a number: "))


# Initialize the sum to 0
sum = 0


# Use a loop to iterate from 1 to N and add each number to the sum
for i in range(1, N+1):
    sum += i


# Print the result
print("The sum of natural numbers up to", N, "is", sum)
```

Output Section :



Practical No. 11

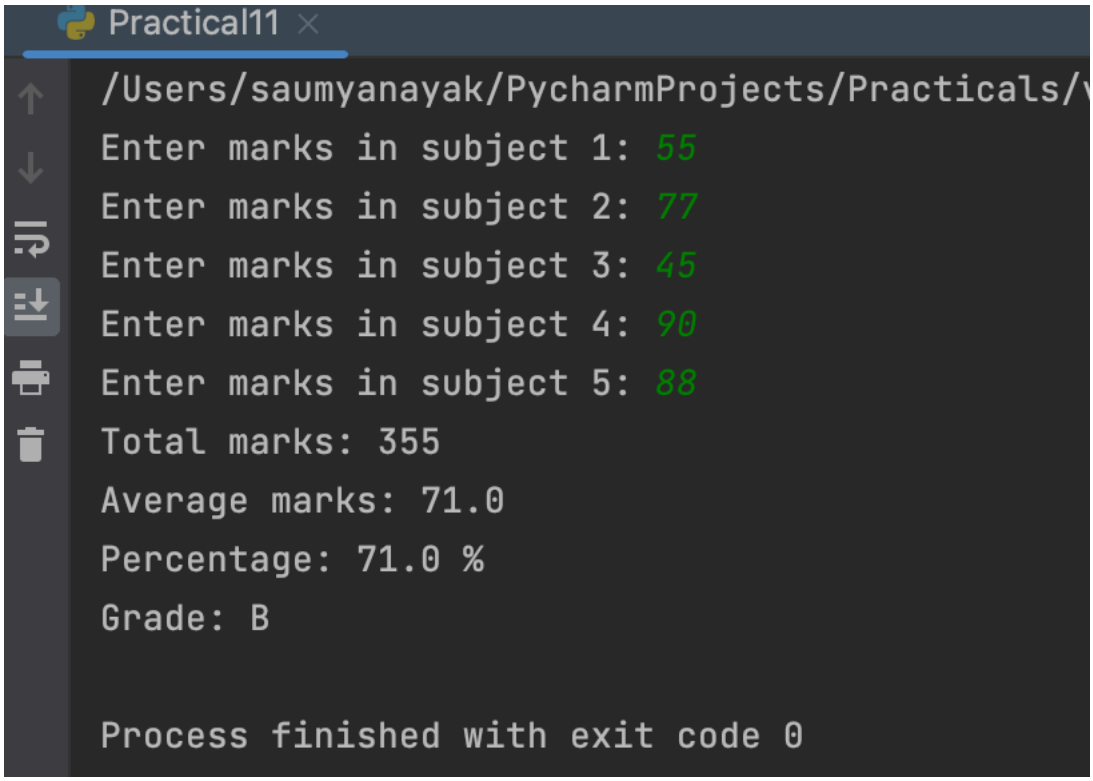
Program : Write a Python program to get marks in five subjects from user and calculate average marks, percentage and grade of a student.

Code Section :

```
# Ask the user to input marks in five subjects
subject1 = int(input("Enter marks in subject 1: "))
subject2 = int(input("Enter marks in subject 2: "))
subject3 = int(input("Enter marks in subject 3: "))
subject4 = int(input("Enter marks in subject 4: "))
subject5 = int(input("Enter marks in subject 5: "))


# Calculate the total marks and average marks
total_marks = subject1 + subject2 + subject3 + subject4 + subject5
average_marks = total_marks / 5


# Calculate the percentage
percentage = (total_marks / 500) * 100


# Determine the grade based on percentage
if percentage >= 90:
    grade = 'A+'
elif percentage >= 80:
    grade = 'A'
elif percentage >= 70:
    grade = 'B'
elif percentage >= 60:
```

```
   grade = 'C'
elif percentage >= 50:
    grade = 'D'
else:
    grade = 'Fail'

# Print the result
print("Total marks:", total_marks)
print("Average marks:", average_marks)
print("Percentage:", percentage, "%")
print("Grade:", grade)
```

Output Section :



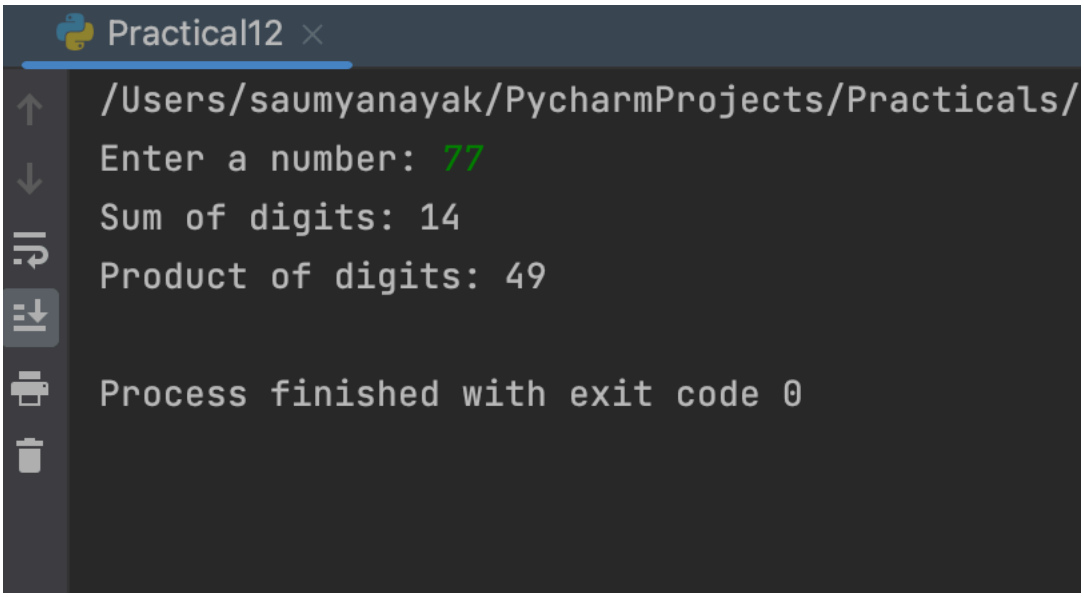
Practical No. 12

Program : Write a Python program to get a number and find the sum and product of its digits.

Code Section :

```
# Ask the user to input a number
number = int(input("Enter a number: "))


# Initialize the sum and product to 0 and 1 respectively
sum = 0
product = 1


# Use a loop to iterate over each digit of the number
while number > 0:
    # Get the last digit of the number
    digit = number % 10


    # Add the digit to the sum and multiply it to the product
    sum += digit
    product *= digit


    # Remove the last digit from the number
    number //= 10


# Print the result
print("Sum of digits:", sum)
print("Product of digits:", product)
```

Output Section :



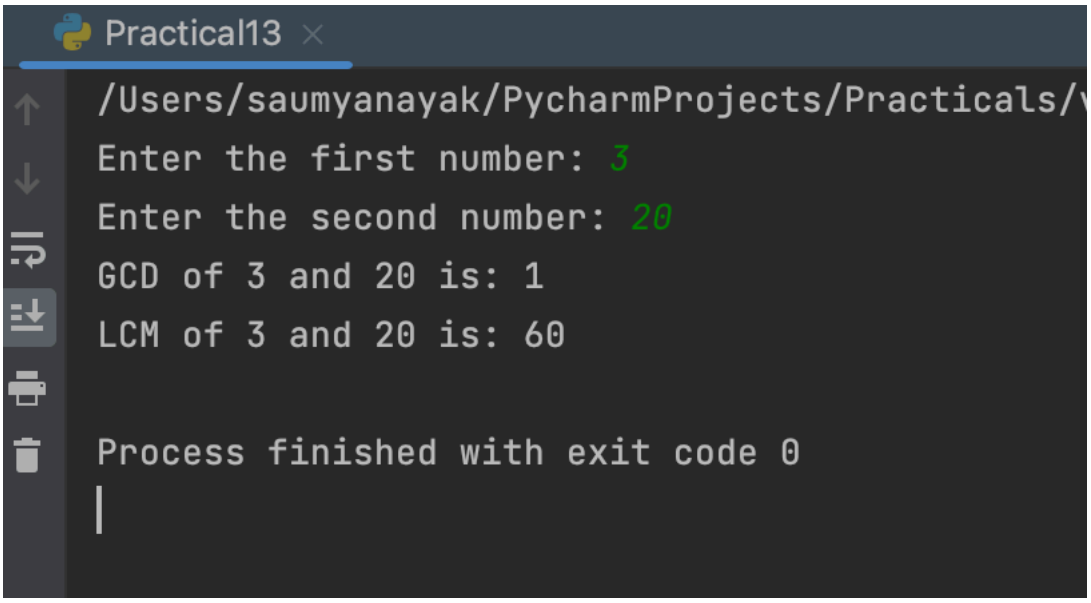
Practical No. 13

Program : Write a Python program to get two integers and find their GCD and LCM.

Code Section :

```
# Function to find GCD of two numbers
def gcd(a, b):
    if b == 0:
        return a
    else:
        return gcd(b, a % b)

# Function to find LCM of two numbers
def lcm(a, b):
    return (a * b) // gcd(a, b)

# Get two integers from the user
num1 = int(input("Enter the first number: "))
num2 = int(input("Enter the second number: "))

# Calculate the GCD and LCM
gcd_value = gcd(num1, num2)
lcm_value = lcm(num1, num2)

# Print the results
print("GCD of", num1, "and", num2, "is:", gcd_value)
print("LCM of", num1, "and", num2, "is:", lcm_value)
```

Output Section :



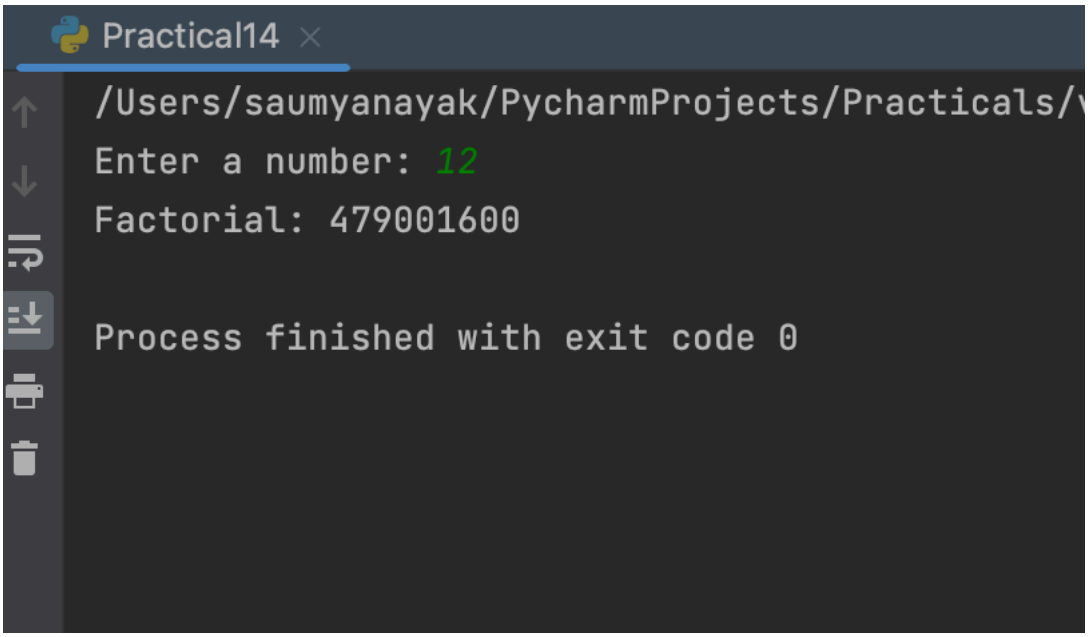
Practical No. 14

Program : Write a Python program to find factorial of a number using while loop.

Code Section :

```
# Get the input from the user
num = int(input("Enter a number: "))


# Initialize the factorial to 1
factorial = 1


# Use a while loop to calculate the factorial
while num > 0:
    factorial *= num
    num -= 1


# Print the result
print("Factorial:", factorial)
```

Output Section :



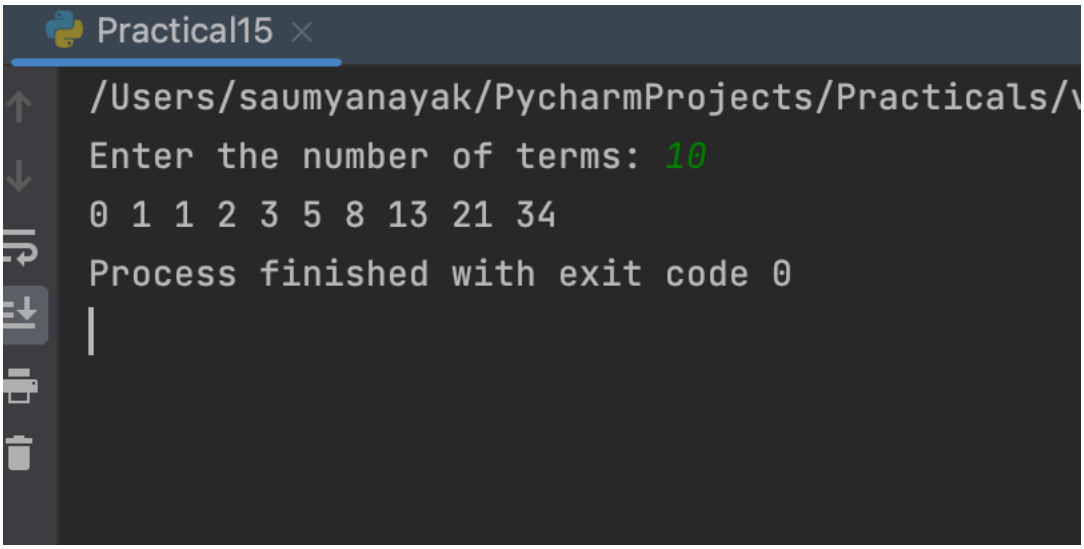
Practical No. 15

Program : Write a Python program to print Fibonacci series up to N terms.

Code Section :

```
# Get the input from the user
num_terms = int(input("Enter the number of terms: "))


# Initialize the first two terms of the series
a = 0
b = 1


# Use a loop to generate the series
for i in range(num_terms):
    print(a, end=" ")
    c = a + b
    a = b
    b = c
```

Output Section :



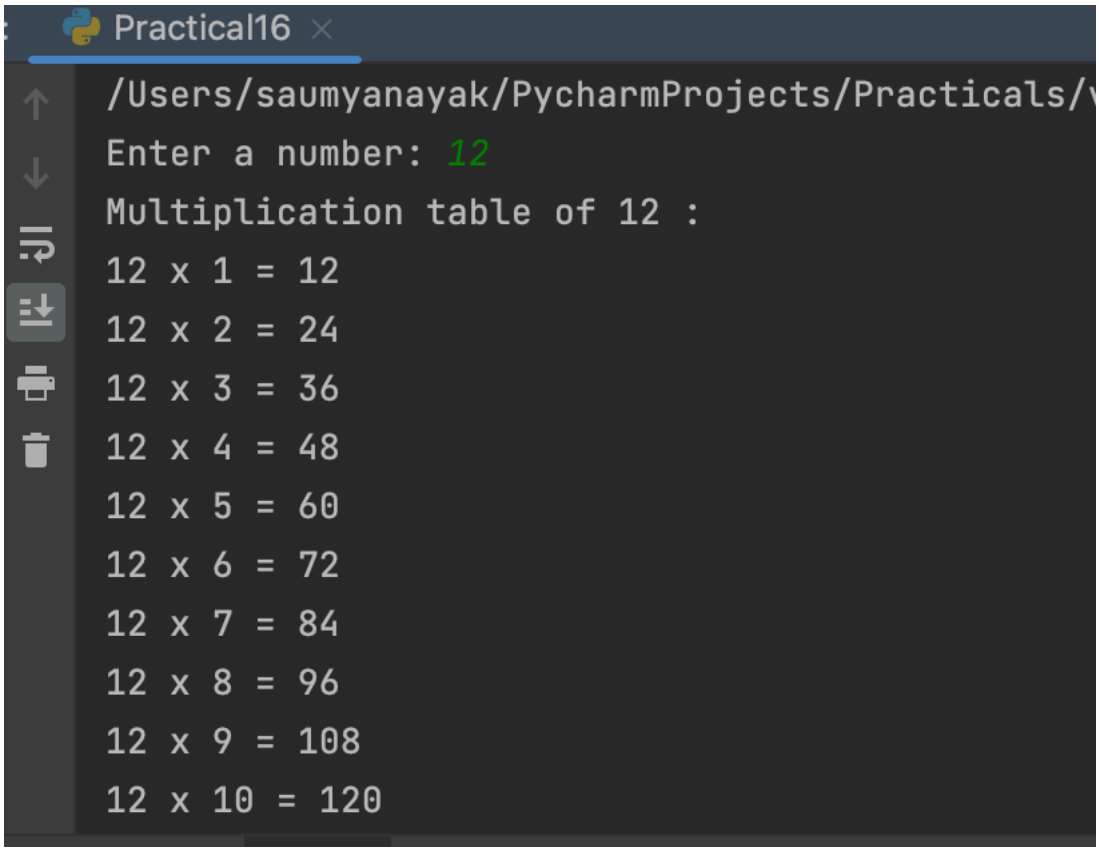
Practical No. 16

Program : Write a Python program to print multiplication table.

Code Section :

```
# Get the input from the user
num = int(input("Enter a number: "))


# Print the multiplication table
print("Multiplication table of", num, ":")


for i in range(1, 11):
    print(num, "x", i, "=", num * i)
```

Output Section :



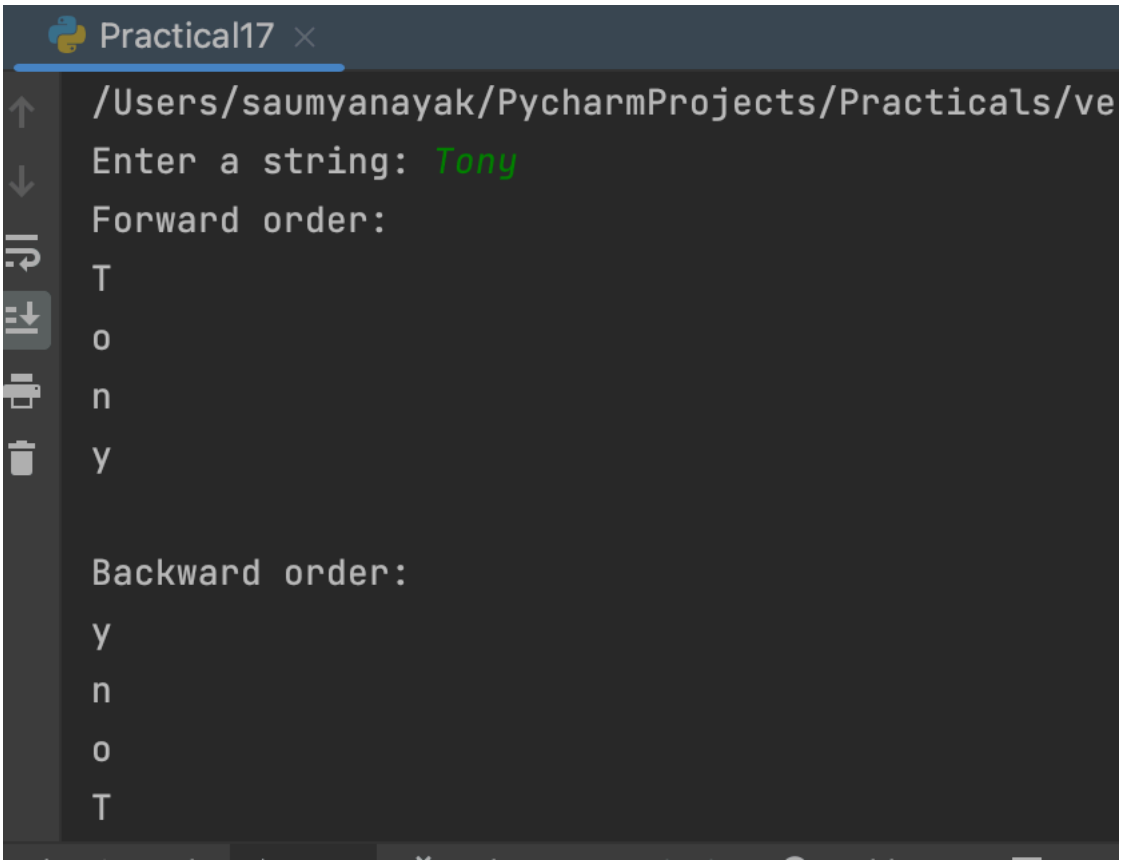
Practical No. 17

Program : Write a Python program to access each element of a string in forward and backward orders using the 'while' loop.

Code Section :

```
# Get the input from the user

string = input("Enter a string: ")


# Access each element of the string in forward order

print("Forward order:")


i = 0

while i < len(string):

    print(string[i])

    i += 1


# Access each element of the string in backward order

print("\nBackward order:")


i = len(string) - 1

while i >= 0:

    print(string[i])

    i -= 1
```

Output Section :



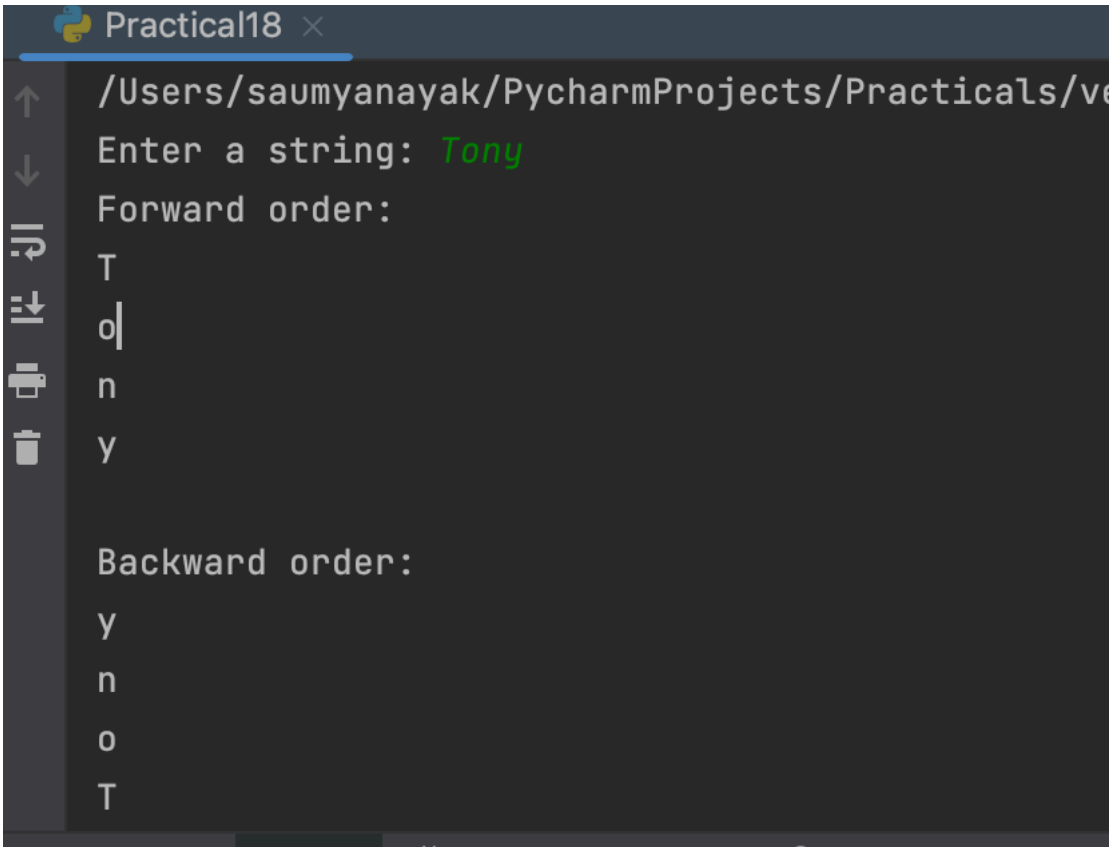
Practical No. 18

Program : Write a Python program to access each element of a string in forward and backward orders using the ‘for’ loop.

Code Section :

```
# Get the input from the user

string = input("Enter a string: ")


# Access each element of the string in forward order

print("Forward order:")


for char in string:

    print(char)


# Access each element of the string in backward order

print("\nBackward order:")


for char in reversed(string):

    print(char)
```

Output Section :



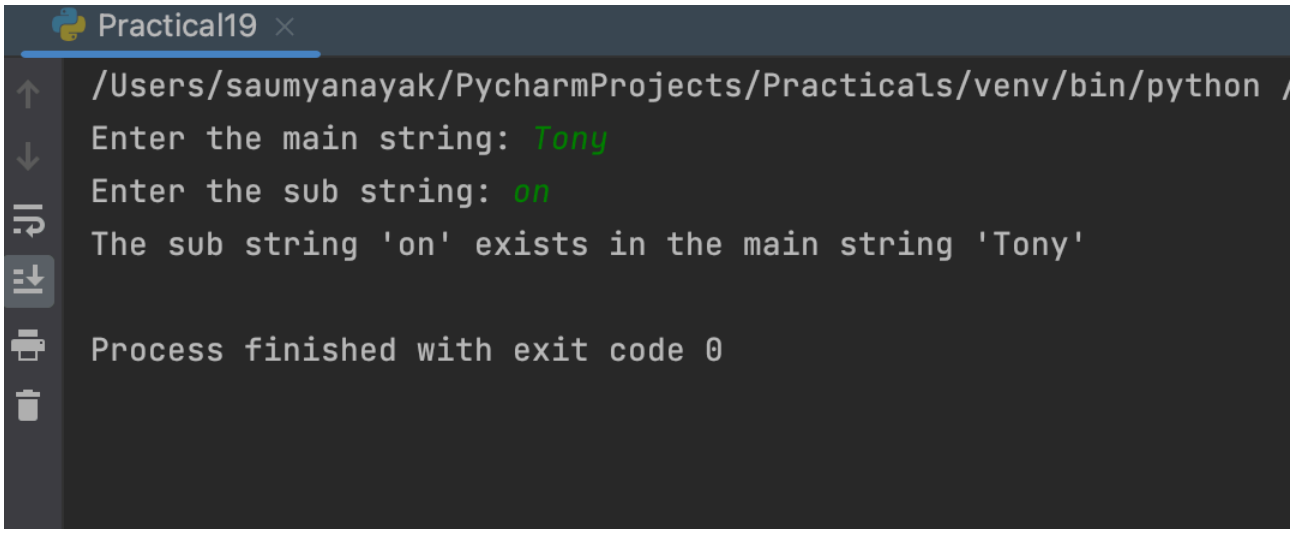
Practical No. 19

Program : Write a Python program to find whether a substring exists in main string or not.

Code Section :

```
# Get the input from the user

main_string = input("Enter the main string: ")

sub_string = input("Enter the sub string: ")


# Check if the sub string exists in the main string

if sub_string in main_string:

    print(f"The sub string '{sub_string}' exists in the main string '{main_string}'")

else:

    print(f"The sub string '{sub_string}' does not exist in the main string '{main_string}'")
```

Output Section :



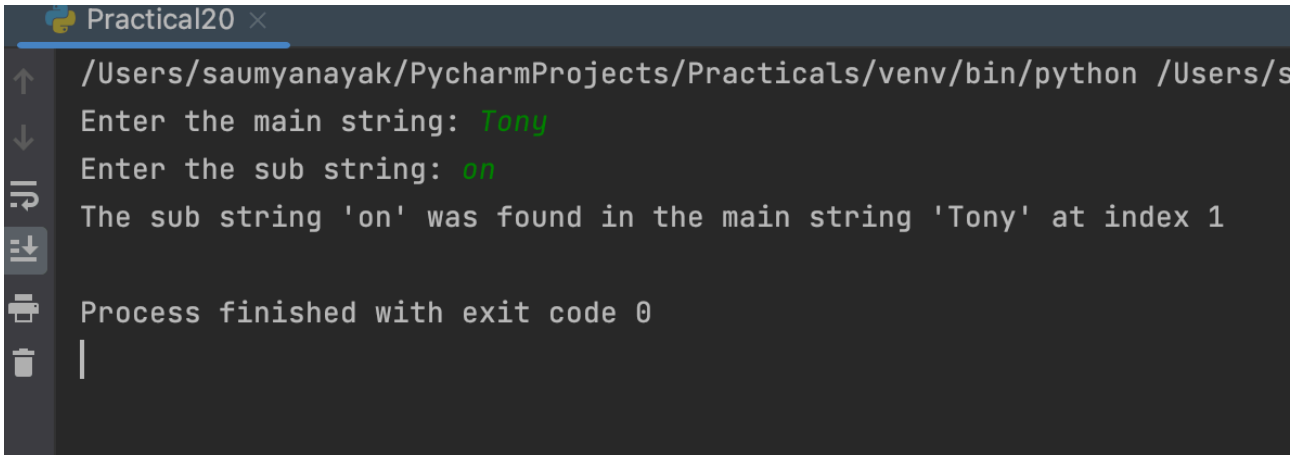
Practical No. 20

Program : Write a Python program to find the first occurrence of a substring in the main string.

Code Section :

```
# Get the input from the user

main_string = input("Enter the main string: ")

sub_string = input("Enter the sub string: ")


# Find the first occurrence of the sub string in the main string

index = main_string.find(sub_string)


# Check if the sub string was found in the main string

if index != -1:

    print(f"The sub string '{sub_string}' was found in the main string '{main_string}' at index {index}")

else:

    print(f"The sub string '{sub_string}' was not found in the main string '{main_string}'")
```

Output Section :



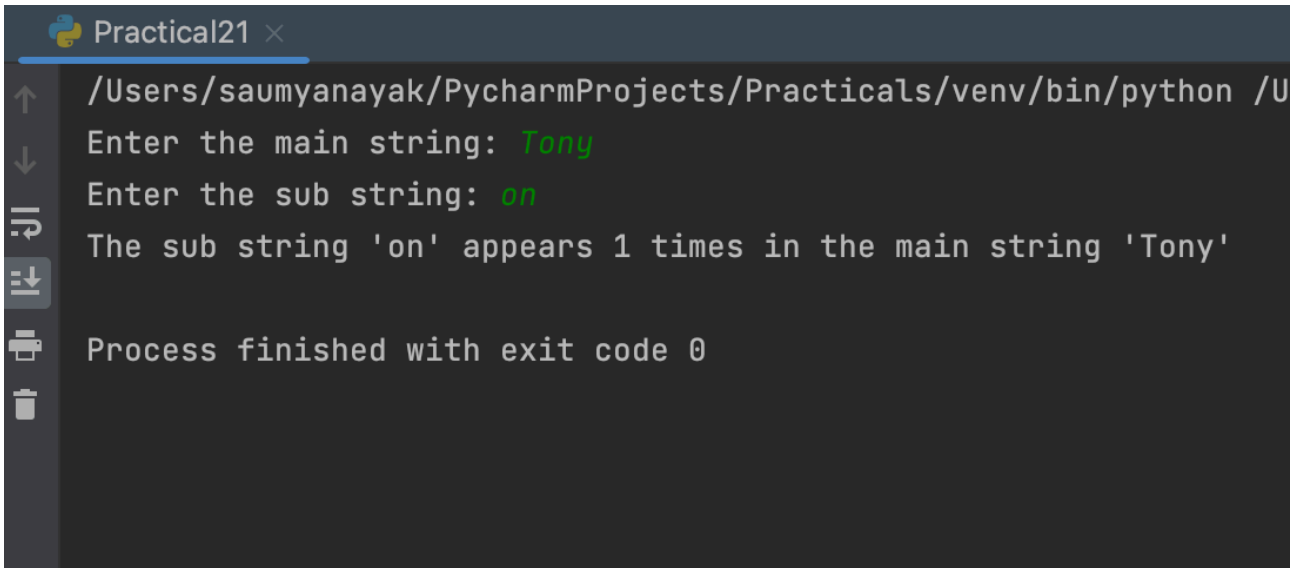
Practical No. 21

Program : Write a Python program to count the number of times a substring appears in the main string.

Code Section :

```
# Get the input from the user

main_string = input("Enter the main string: ")

sub_string = input("Enter the sub string: ")


# Count the number of occurrences of the sub string in the main string

count = main_string.count(sub_string)


# Print the result

print(f"The sub string '{sub_string}' appears {count} times in the main string '{main_string}'")
```

Output Section :



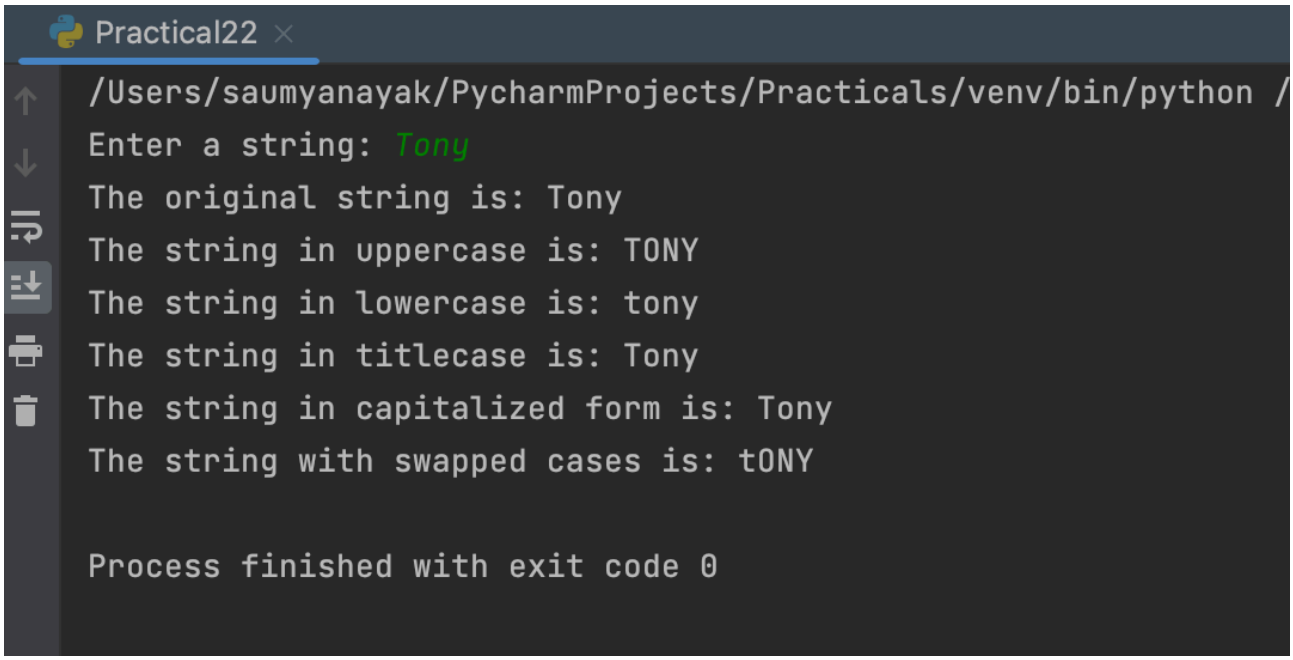
Practical No. 22

Program : Write a Python program to demonstrate the use of all “casing” methods and display a string in different cases.

Code Section :

```
# Get the input from the user

input_string = input("Enter a string: ")


# Convert the string to different cases using casing methods

uppercase_string = input_string.upper()

lowercase_string = input_string.lower()

titlecase_string = input_string.title()

capitalized_string = input_string.capitalize()

swapcase_string = input_string.swapcase()


# Print the string in different cases

print(f"The original string is: {input_string}")

print(f"The string in uppercase is: {uppercase_string}")

print(f"The string in lowercase is: {lowercase_string}")

print(f"The string in titlecase is: {titlecase_string}")

print(f"The string in capitalized form is: {capitalized_string}")

print(f"The string with swapped cases is: {swapcase_string}")
```

Output Section :



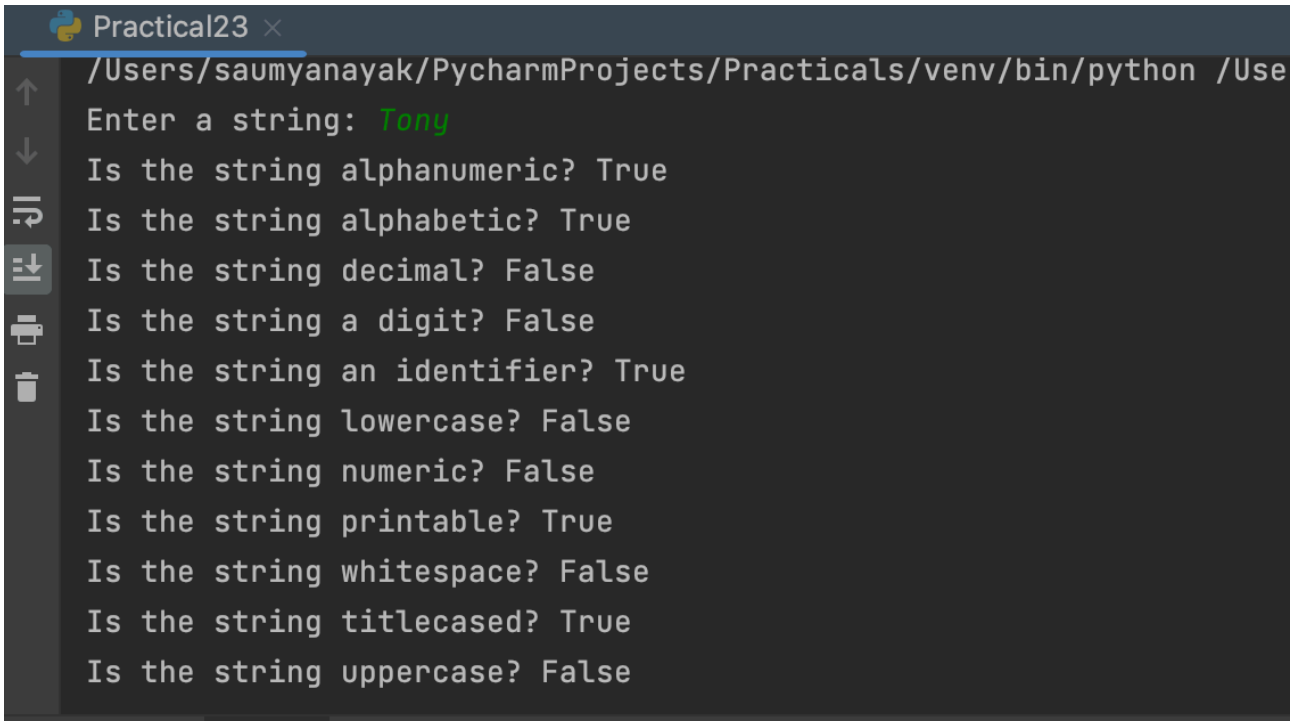
Practical No. 23

Program : Write a Python program to demonstrate the use of all string testing {isXXX()} methods.

Code Section :

```
# Get the input from the user

input_string = input("Enter a string: ")


# Use string testing methods to check different properties of the string

print(f"Is the string alphanumeric? {input_string.isalnum()}")

print(f"Is the string alphabetic? {input_string.isalpha()}")

print(f"Is the string decimal? {input_string.isdecimal()}")

print(f"Is the string a digit? {input_string.isdigit()}")

print(f"Is the string an identifier? {input_string.isidentifier()}")

print(f"Is the string lowercase? {input_string.islower()}")

print(f"Is the string numeric? {input_string.isnumeric()}")

print(f"Is the string printable? {input_string.isprintable()}")

print(f"Is the string whitespace? {input_string.isspace()}")

print(f"Is the string titlecased? {input_string.istitle()}")

print(f"Is the string uppercase? {input_string.isupper()}")
```

Output Section :



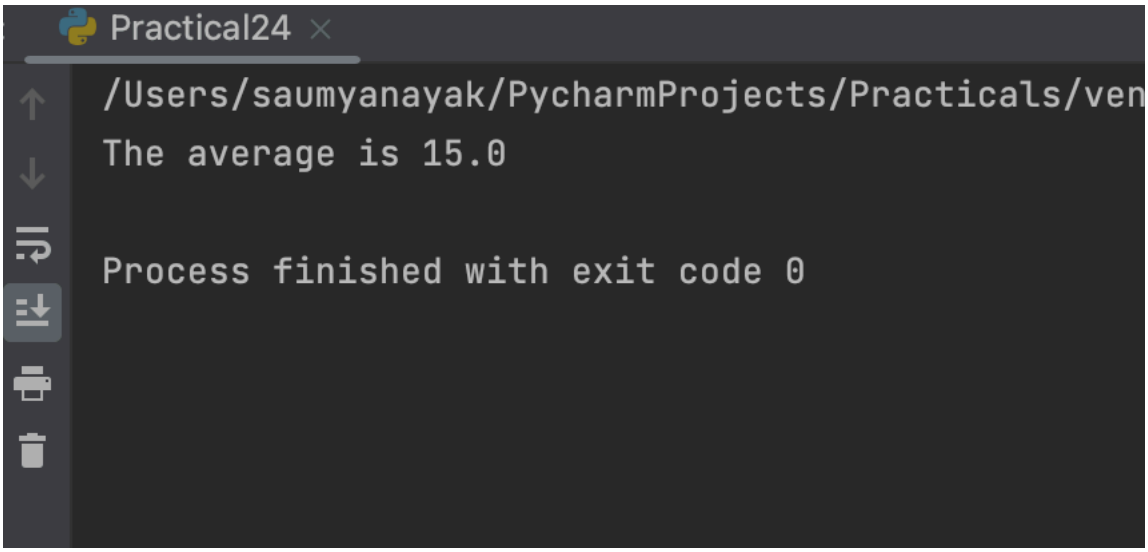
Practical No. 24

Program : Write a Python function to take a list of integers as input and return the average.

Code Section :

```
def find_average(lst):
    if len(lst) == 0:
        return 0
    else:
        return sum(lst) / len(lst)


lst = [5, 10, 15, 20, 25]
average = find_average(lst)
print(f"The average is {average}")
```

Output Section :



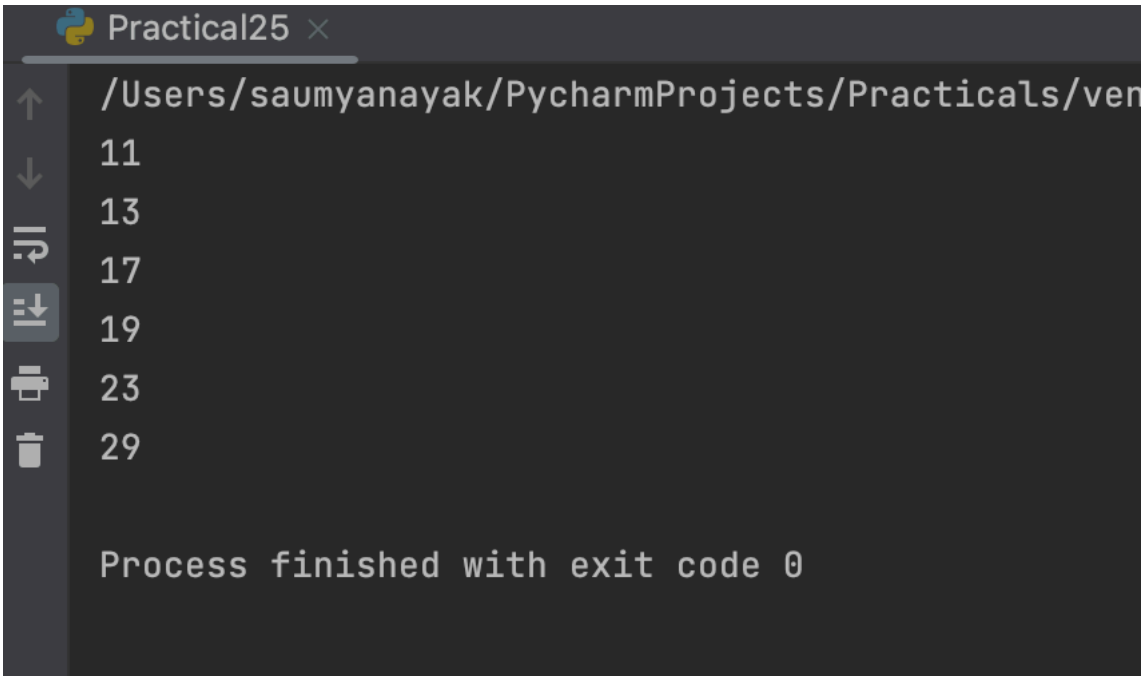
Practical No. 25

Program : Write a Python function to take two distinct integers as input and print all prime numbers between them.

Code Section :

```
def print_primes_between(num1, num2):
    for num in range(num1, num2 + 1):
        if num > 1:
            for i in range(2, num):
                if (num % i) == 0:
                    break
            else:
                print(num)

print_primes_between(10, 30)
```

Output Section :



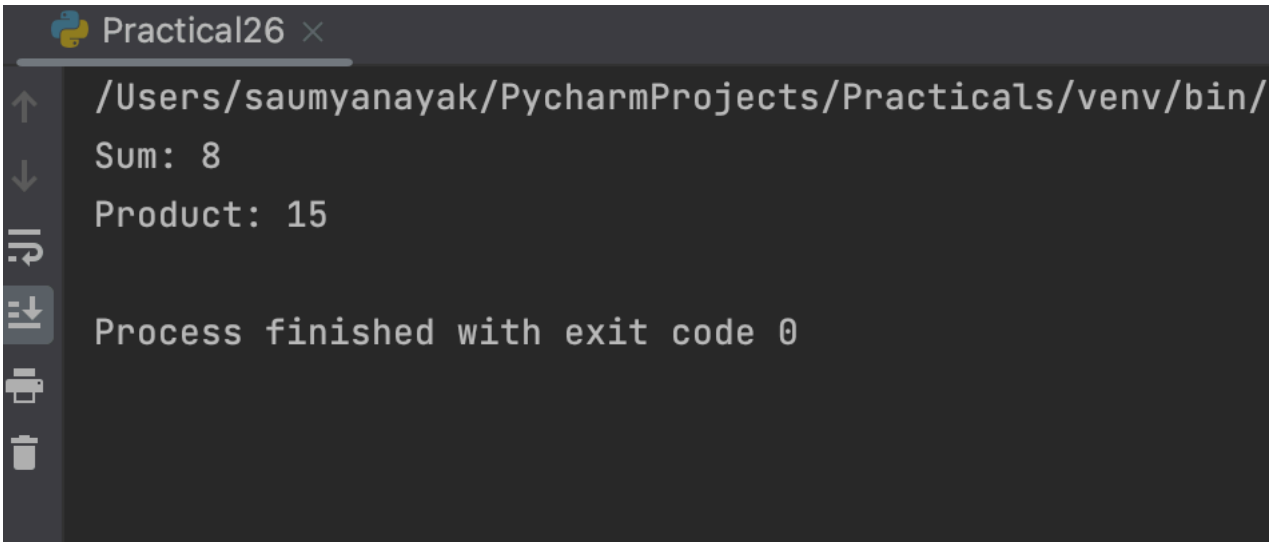
Practical No. 26

Program : Write a Python function to take two integers as input and return both their sum and product.

Code Section :

```
def sum_and_product(num1, num2):
    sum = num1 + num2
    product = num1 * num2
    return sum, product


result = sum_and_product(3, 5)
print("Sum:", result[0])
print("Product:", result[1])
```

Output Section :



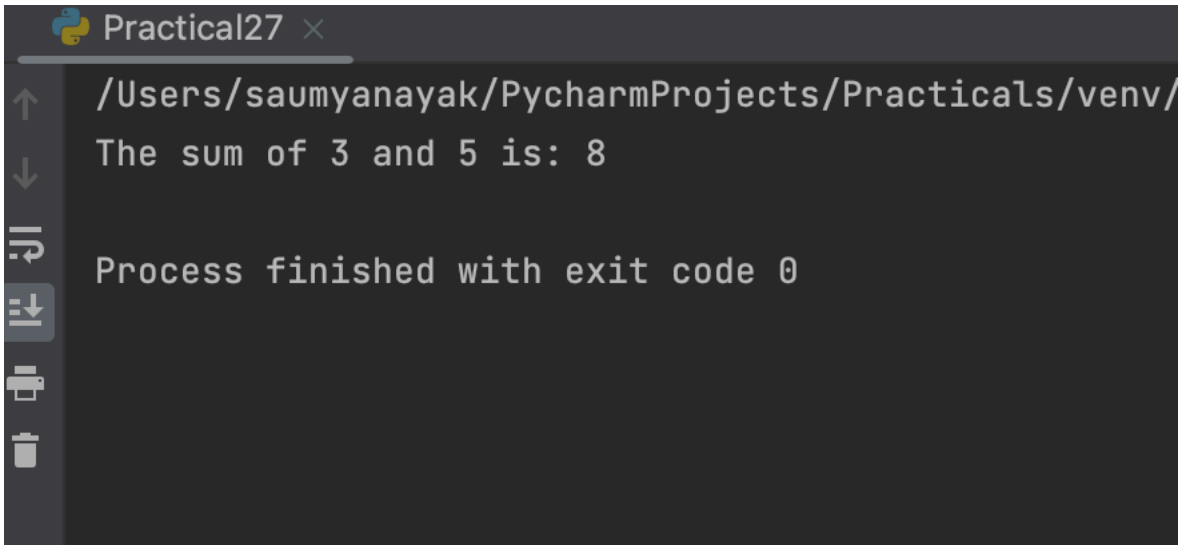
Practical No. 27

Program : Write a Python program to demonstrate the positional arguments of a function.

Code Section :

```
def add_numbers(a, b):
    sum = a + b
    return sum


result = add_numbers(3, 5)
print("The sum of 3 and 5 is:", result)
```

Output Section :



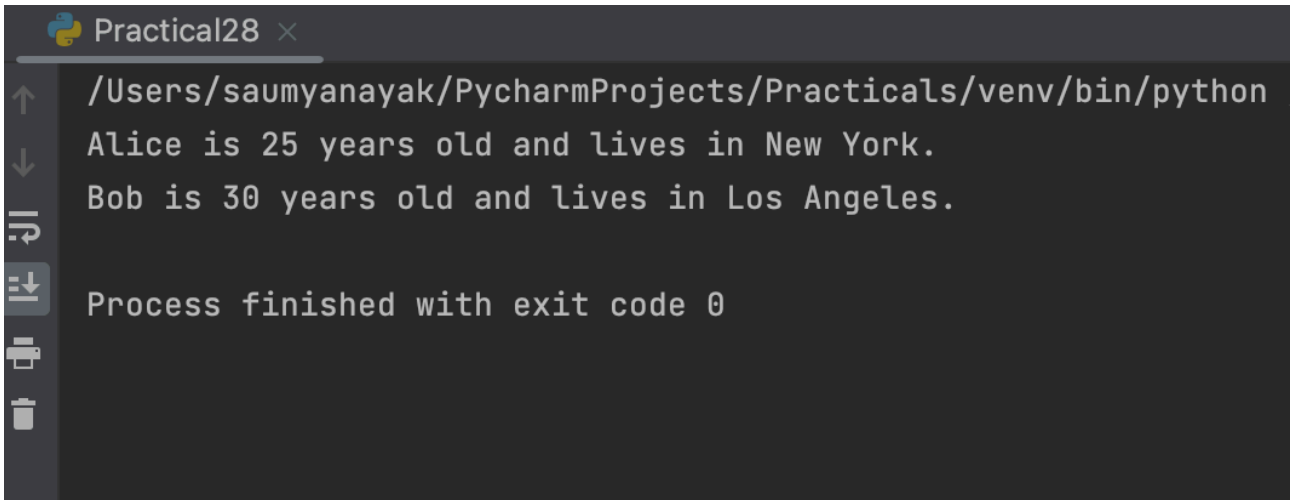
Practical No. 28

Program : Write a Python program to demonstrate the keyword arguments of a function.

Code Section :

```
def describe_person(name, age, city):
    print(f"{name} is {age} years old and lives in {city}.")


# calling the function using positional arguments
describe_person("Alice", 25, "New York")


# calling the function using keyword arguments
describe_person(name="Bob", age=30, city="Los Angeles")
```

Output Section :



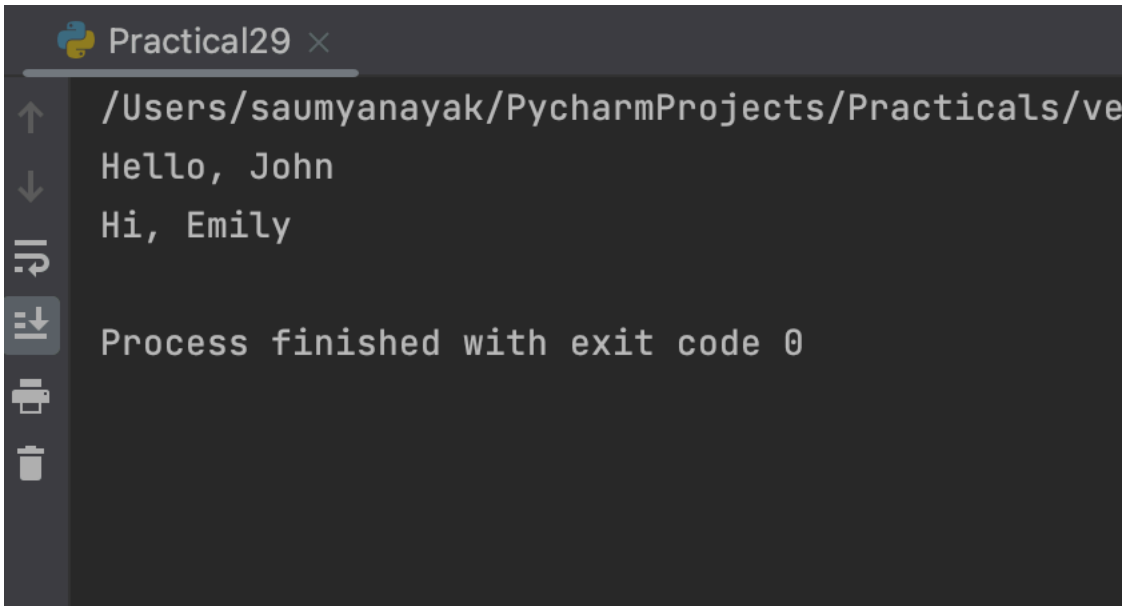
Practical No. 29

Program : Write a Python program to demonstrate the default arguments of a function.

Code Section :

```
def greet(name, greeting="Hello"):
    print(greeting + ", " + name)


# Call the function with one argument
greet("John") # Output: Hello, John


# Call the function with two arguments
greet("Emily", "Hi") # Output: Hi, Emily
```

Output Section :



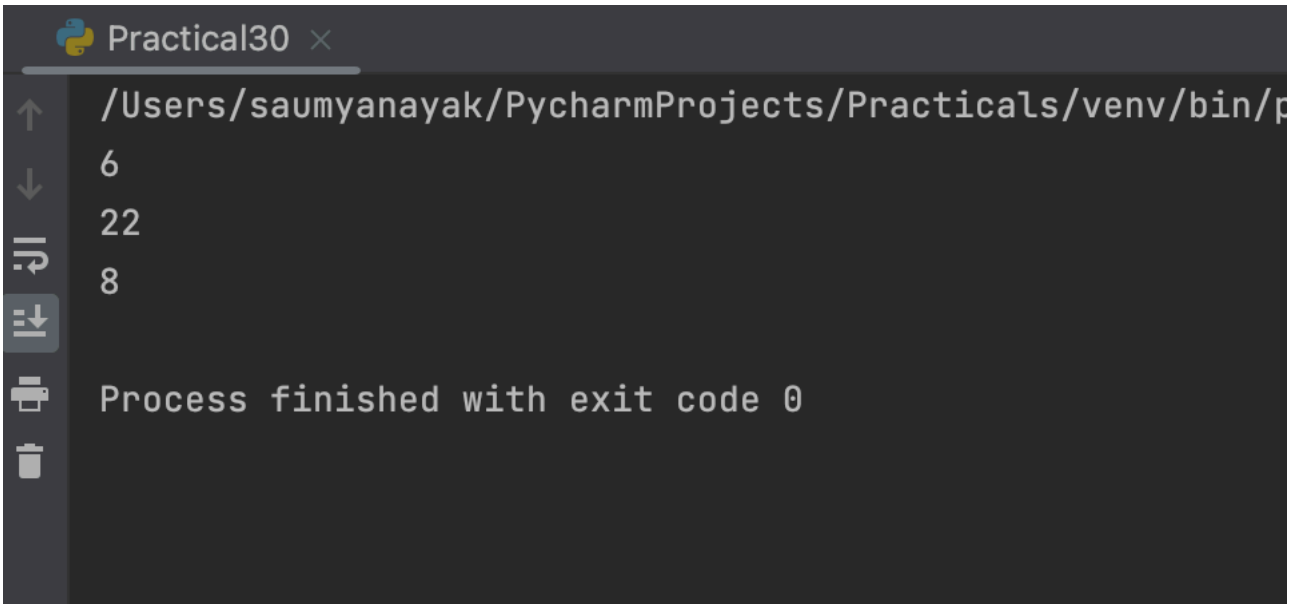
Practical No. 30

Program : Write a Python function to demonstrate variable length arguments.

Code Section :

```
def add_numbers(*args):
    total = 0
    for num in args:
        total += num
    return total


# Call the function with different number of arguments
print(add_numbers(1, 2, 3)) # Output: 6
print(add_numbers(4, 5, 6, 7)) # Output: 22
print(add_numbers(8)) # Output: 8
```

Output Section :



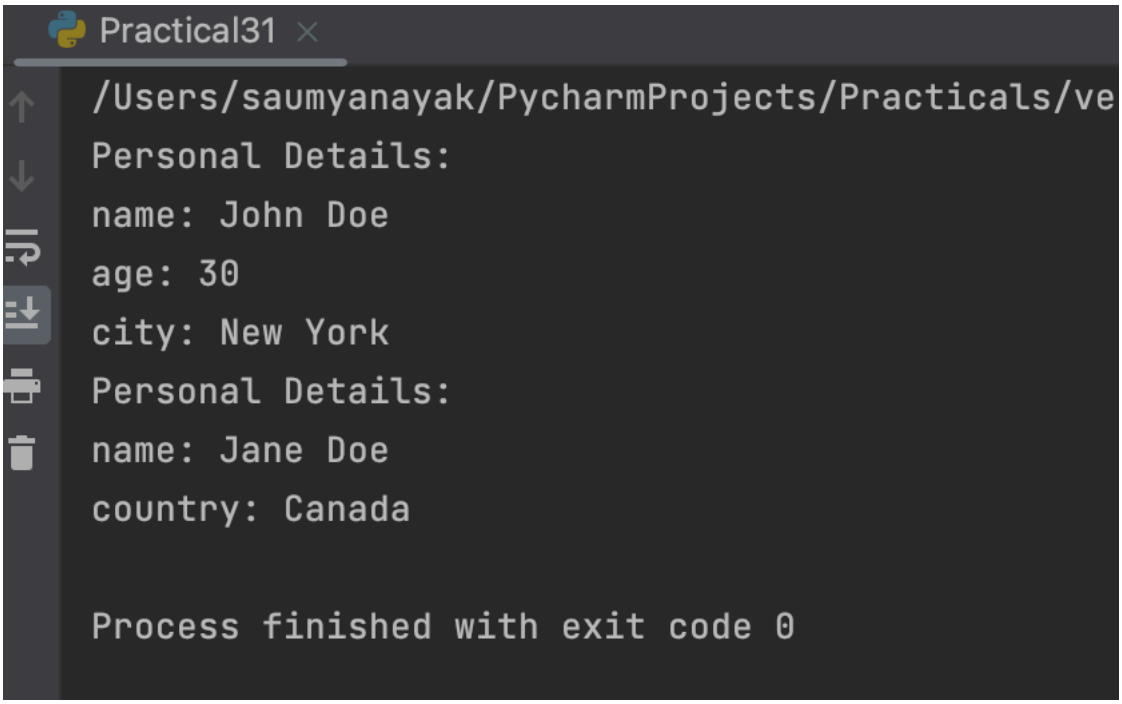
Practical No. 31

Program : Write a Python function to demonstrate keyword variable length arguments.

Code Section :

```
def person_details(**kwargs):
    print("Personal Details:")
    for key, value in kwargs.items():
        print(f"{key}: {value}")


# Call the function with different keyword arguments
person_details(name="John Doe", age=30, city="New York")
person_details(name="Jane Doe", country="Canada")
```

Output Section :



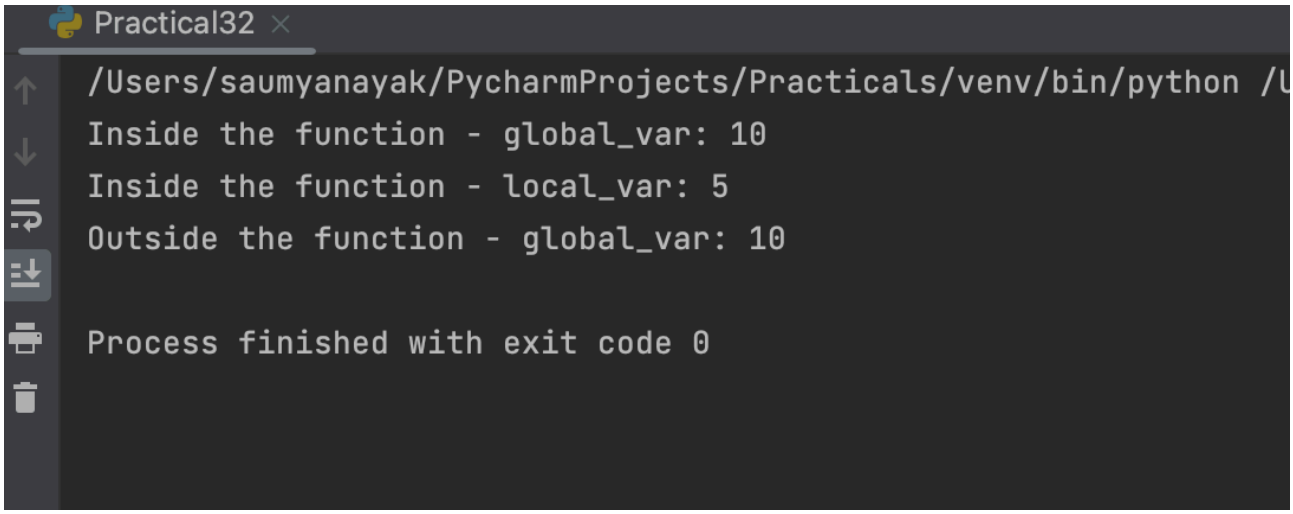
Practical No. 32

Program : Write a Python program to demonstrate global and local variables.

Code Section :

```
# Global variable
global_var = 10

def func():
    # Local variable
    local_var = 5
    # Accessing the global variable within the function
    print("Inside the function - global_var:", global_var)
    # Accessing the local variable within the function
    print("Inside the function - local_var:", local_var)

# Call the function
func()

# Accessing the global variable outside the function
print("Outside the function - global_var:", global_var)

# Trying to access the local variable outside the function raises an error
#print("Outside the function - local_var:", local_var)
```

Output Section :



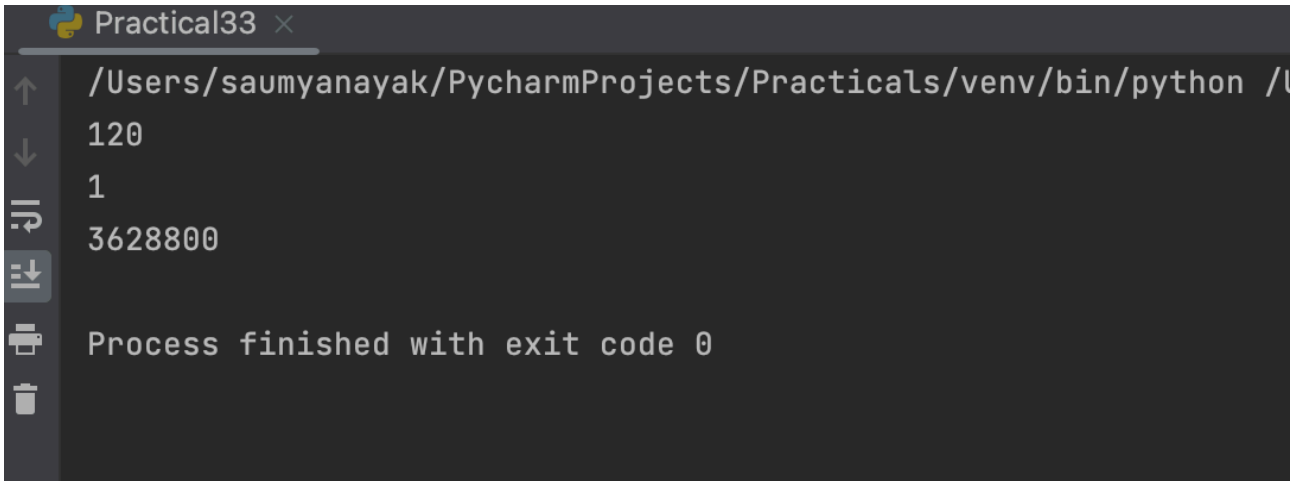
Practical No. 33

Program : Write a Python function that takes an integer as input and calculates its factorial using recursion.

Code Section :

```
def factorial(n):
    if n == 0:
        return 1
    else:
        return n * factorial(n-1)


print(factorial(5))   # Output: 120
print(factorial(0))   # Output: 1
print(factorial(10))  # Output: 3628800
```

Output Section :



Practical No. 34

Program : Write a Python program to demonstrate the use of lambda functions.

Code Section :

```
# Example 1: Lambda function to add two numbers
add = lambda x, y: x + y
print(add(3, 5))  # Output: 8

# Example 2: Lambda function to check if a number is even
is_even = lambda x: x % 2 == 0
print(is_even(4))  # Output: True

# Example 3: Sorting a list of strings by their length using lambda function
fruits = ['apple', 'banana', 'orange', 'mango']
sorted_fruits = sorted(fruits, key=lambda x: len(x))
print(sorted_fruits)  # Output: ['mango', 'apple', 'banana', 'orange']
```

Output Section :

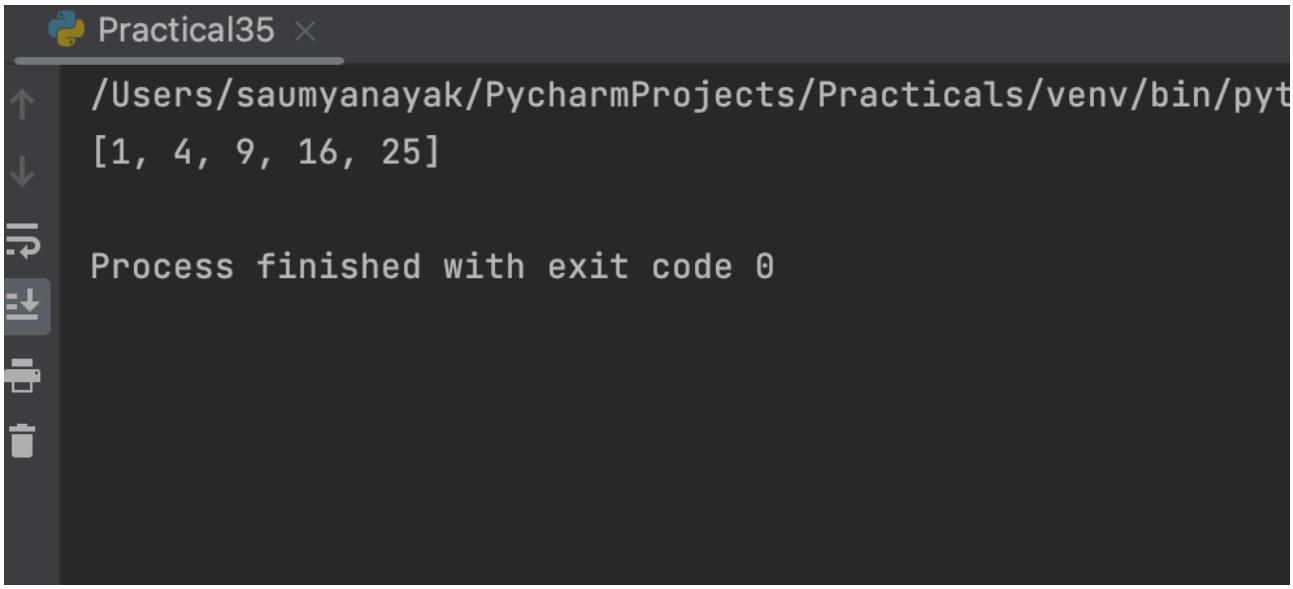
Practical No. 35

Program : Write a Python program to demonstrate the use of lambda functions and map.

Code Section :

```
# Define a list of numbers

numbers = [1, 2, 3, 4, 5]


# Use lambda function and map to square each number in the list

squared_numbers = list(map(lambda x: x**2, numbers))


# Print the squared numbers

print(squared_numbers)
```

Output Section :



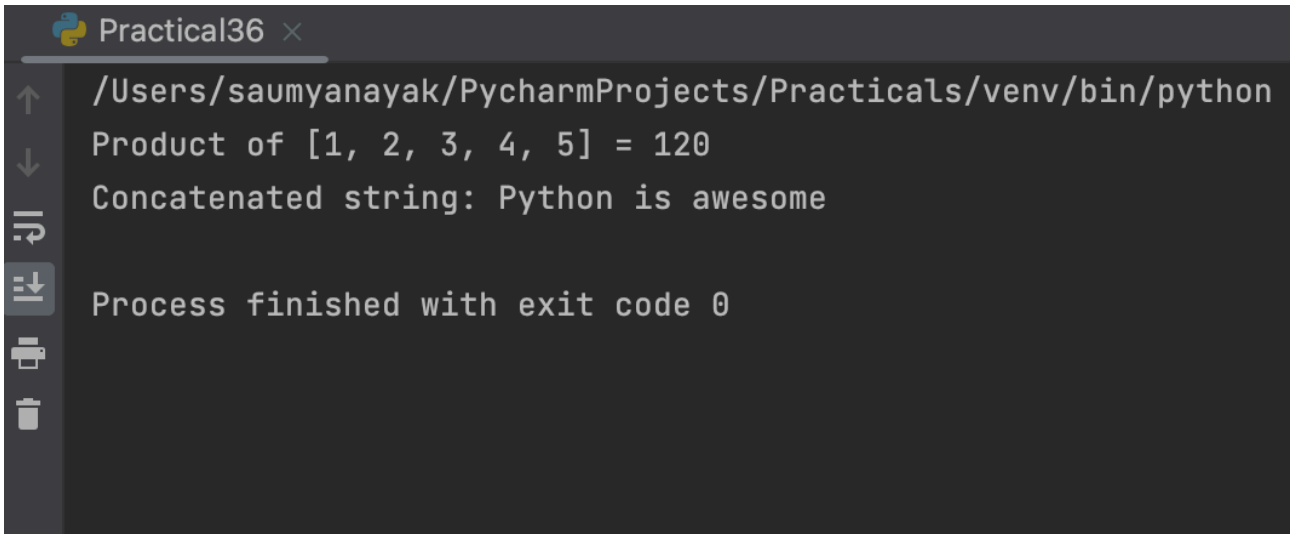
Practical No. 36

Program : Write a Python program to demonstrate the use of lambda functions and reduce.

Code Section :

```
from functools import reduce


# using lambda functions with reduce to calculate the product of a list of numbers
nums = [1, 2, 3, 4, 5]
product = reduce(lambda x, y: x * y, nums)
print(f"Product of {nums} = {product}")


# using lambda functions with reduce to concatenate a list of strings
strings = ["Python", "is", "awesome"]
result = reduce(lambda x, y: x + " " + y, strings)
print(f"Concatenated string: {result}")
```

Output Section :



Practical No. 37

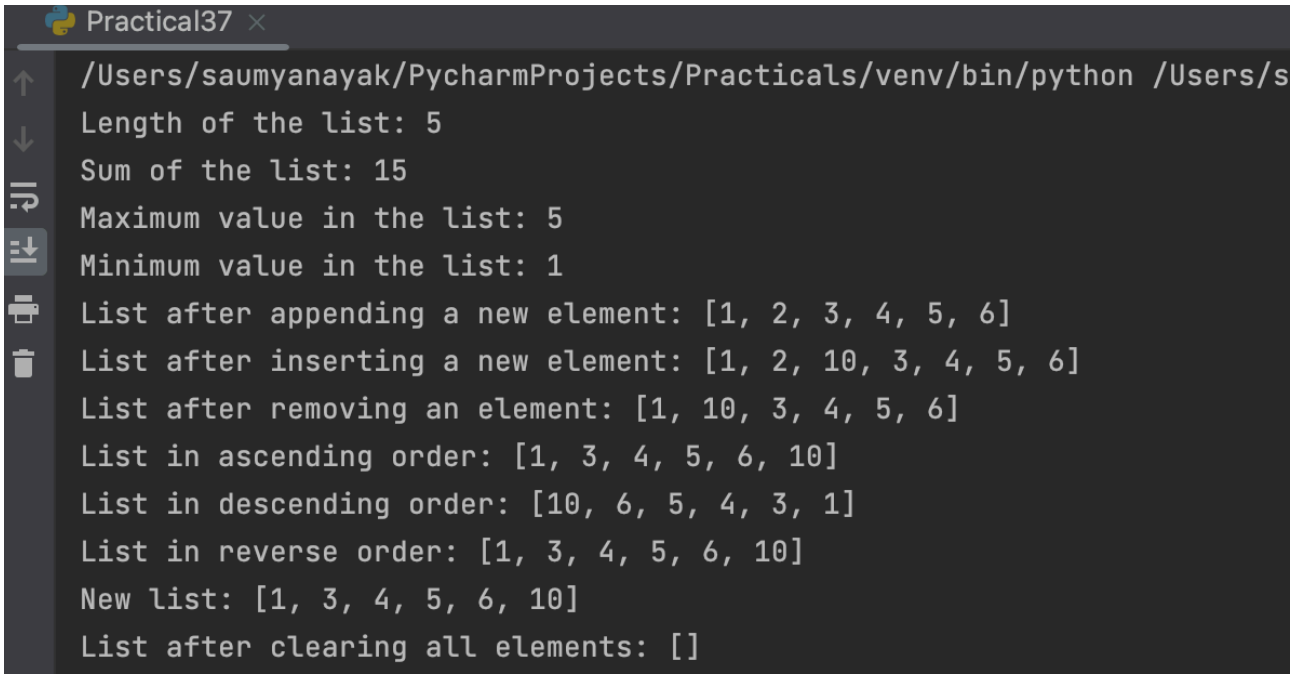
Program : Write a Python program to demonstrate the various list processing methods.

Code Section :

```
# create a list of integers

nums = [1, 2, 3, 4, 5]


# print the length of the list

print("Length of the list:", len(nums))


# print the sum of the list

print("Sum of the list:", sum(nums))


# print the maximum value in the list

print("Maximum value in the list:", max(nums))


# print the minimum value in the list

print("Minimum value in the list:", min(nums))


# add a new element to the end of the list

nums.append(6)

print("List after appending a new element:", nums)


# insert a new element at a specific position in the list

nums.insert(2, 10)

print("List after inserting a new element:", nums)
```

```
# remove the first occurrence of an element in the list
nums.remove(2)
print("List after removing an element:", nums)

# sort the list in ascending order
nums.sort()
print("List in ascending order:", nums)

# sort the list in descending order
nums.sort(reverse=True)
print("List in descending order:", nums)

# reverse the order of the list
nums.reverse()
print("List in reverse order:", nums)

# create a copy of the list
new_nums = nums.copy()
print("New list:", new_nums)

# clear all elements from the list
nums.clear()
print("List after clearing all elements:", nums)
```

Output Section :



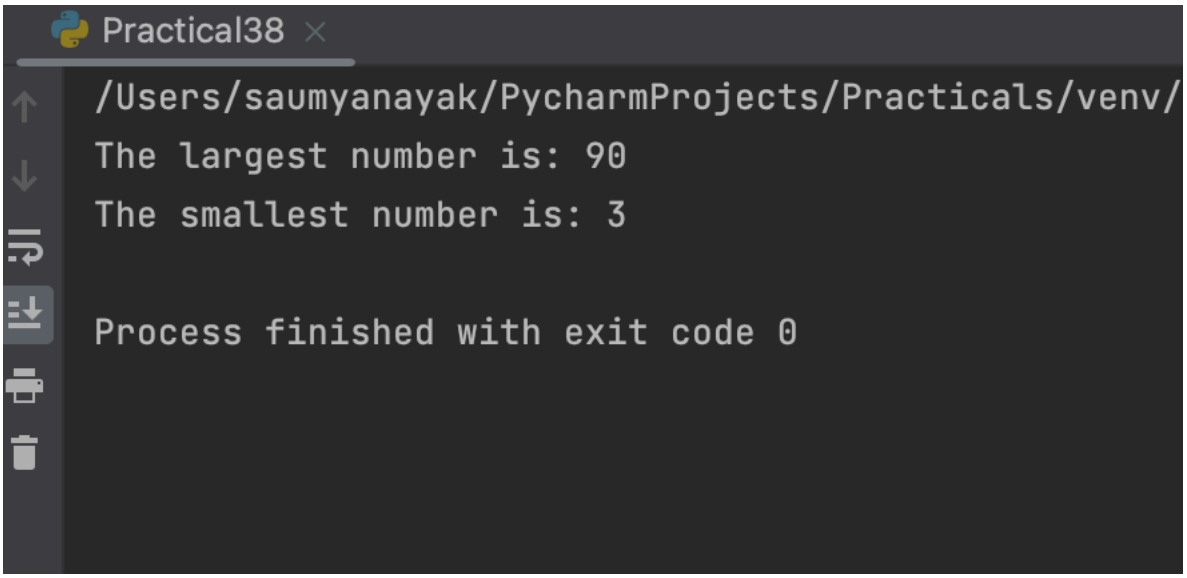
Practical No. 38

Program : Write a Python program to find the biggest and smallest numbers in a list of integers.

Code Section :

```
def find_largest_smallest(numbers):
    largest = max(numbers)
    smallest = min(numbers)
    return largest, smallest


numbers = [12, 3, 45, 6, 78, 90, 23]
largest, smallest = find_largest_smallest(numbers)


print("The largest number is:", largest)
print("The smallest number is:", smallest)
```

Output Section :



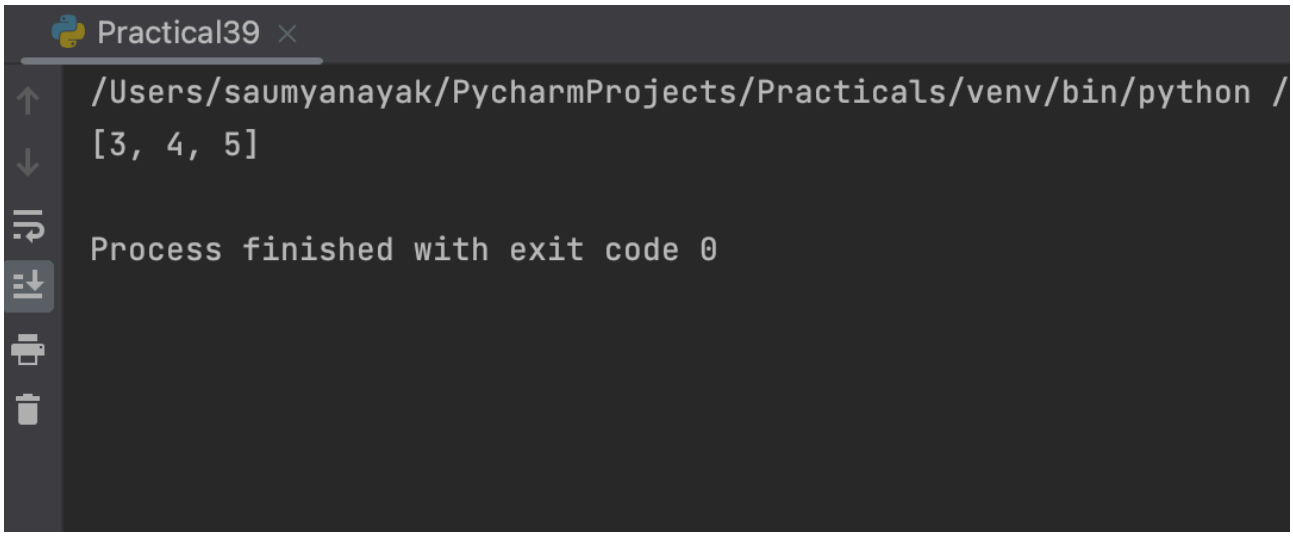
Practical No. 39

Program : Write a Python program to find common elements in two lists.

Code Section :

```
def common_elements(list1, list2):
    set1 = set(list1)
    set2 = set(list2)
    common = list(set1.intersection(set2))
    return common


# Example usage
list1 = [1, 2, 3, 4, 5]
list2 = [3, 4, 5, 6, 7]
print(common_elements(list1, list2)) # Output: [3, 4, 5]
```

Output Section :



Practical No. 40

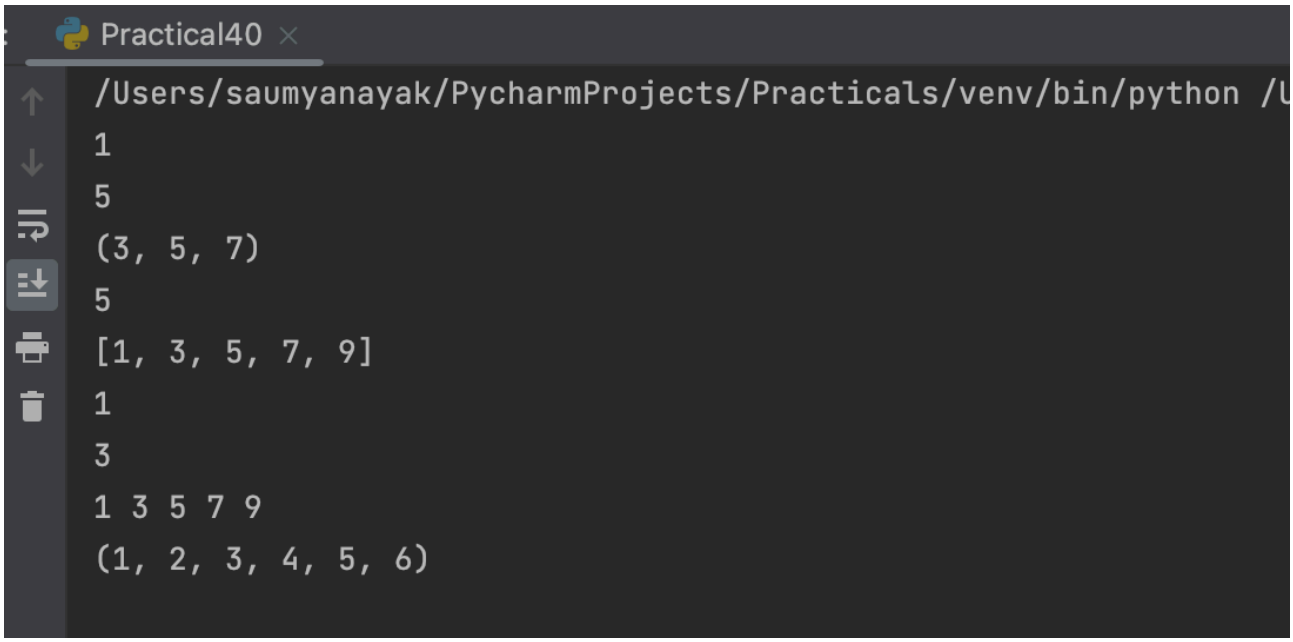
Program : Write a Python program to demonstrate the various tuple processing methods.

Code Section :

```
# create a tuple

my_tuple = (1, 3, 5, 7, 9)


# access elements of tuple using indexing

print(my_tuple[0])  # 1

print(my_tuple[2])  # 5


# slicing

print(my_tuple[1:4])  # (3, 5, 7)


# length of tuple

print(len(my_tuple))  # 5


# convert tuple to list

my_list = list(my_tuple)

print(my_list)  # [1, 3, 5, 7, 9]


# count number of occurrences of an element

print(my_tuple.count(5))  # 1


# index of the first occurrence of an element

print(my_tuple.index(7))  # 3
```

```
# unpacking a tuple
a, b, c, d, e = my_tuple
print(a, b, c, d, e)  # 1 3 5 7 9

# combining tuples
tuple1 = (1, 2, 3)
tuple2 = (4, 5, 6)
combined_tuple = tuple1 + tuple2
print(combined_tuple)  # (1, 2, 3, 4, 5, 6)
```

Output Section :



Practical No. 41

Program : Write a Python program to demonstrate the use of dictionaries.

Code Section :

```
# Define a dictionary with some key-value pairs

person = {'name': 'John', 'age': 30, 'city': 'New York'}


# Accessing dictionary values using keys

print(person['name'])  # Output: John

print(person['age'])  # Output: 30

print(person['city'])  # Output: New York

# Adding a new key-value pair to the dictionary

person['occupation'] = 'Software Engineer'

print(person)  # Output: {'name': 'John', 'age': 30, 'city': 'New York', 'occupation': 'Software Engineer'}

# Modifying an existing value in the dictionary

person['age'] = 35

print(person)  # Output: {'name': 'John', 'age': 35, 'city': 'New York', 'occupation': 'Software Engineer'}

# Removing a key-value pair from the dictionary

del person['occupation']

print(person)  # Output: {'name': 'John', 'age': 35, 'city': 'New York'}

# Looping through all the keys in a dictionary

for key in person:

    print(key, person[key])
```

Output Section :

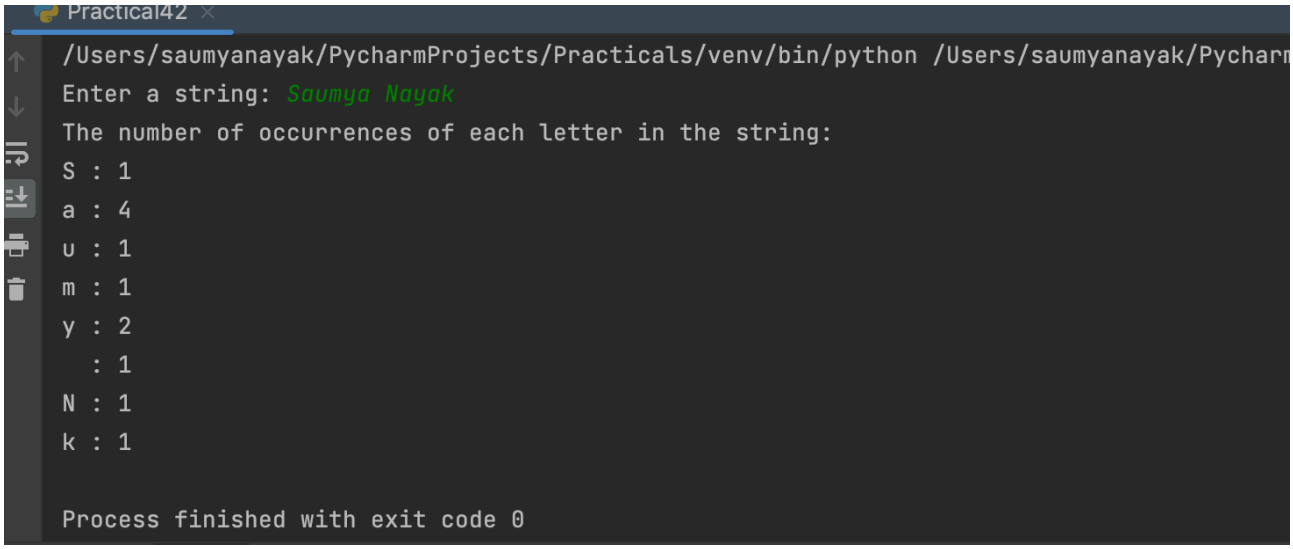
Practical No. 42

Program : Write a Python program to find the number of occurrences of each letter in a string using dictionaries.

Code Section :

```
string = input("Enter a string: ")

count = {}


for letter in string:
    if letter in count:
        count[letter] += 1
    else:
        count[letter] = 1


print("The number of occurrences of each letter in the string:")
for letter, num in count.items():
    print(letter, ":", num)
```

Output Section :



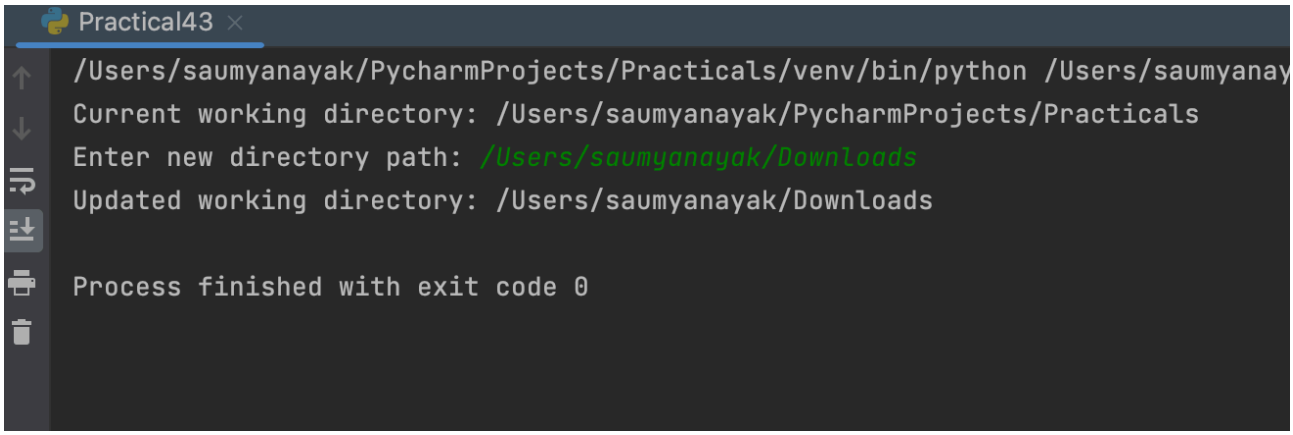
Practical No. 43

Program : Write a Python program to print the CWD and change the CWD.

Code Section :

```
import os


# Print the current working directory
print("Current working directory:", os.getcwd())


# Change the current working directory
new_dir = input("Enter new directory path: ")
os.chdir(new_dir)


# Print the updated current working directory
print("Updated working directory:", os.getcwd())
```

Output Section :



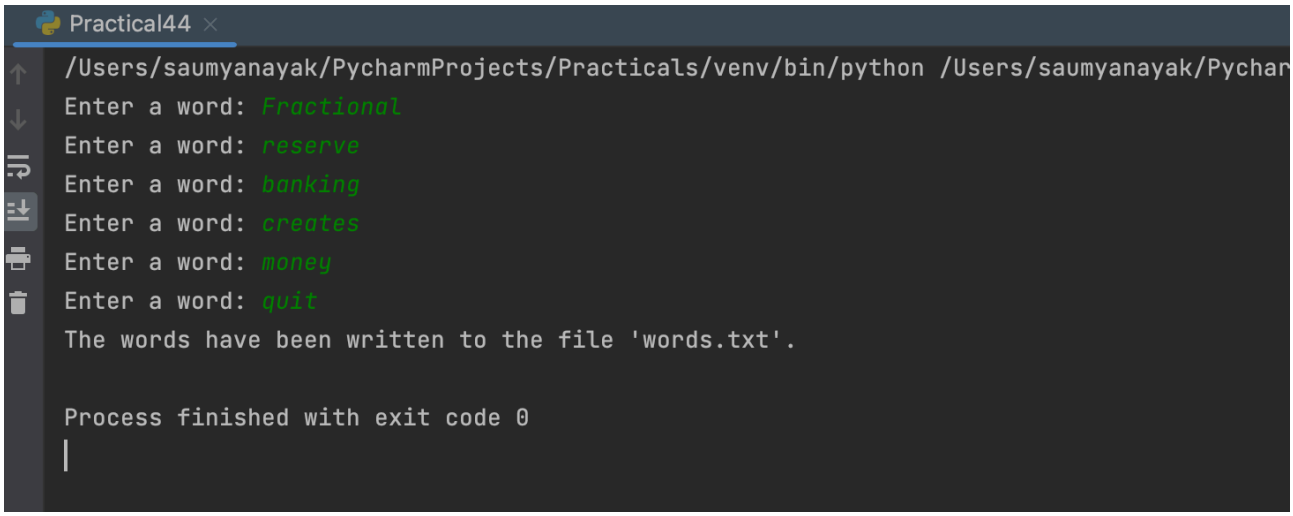
Practical No. 44

Program : Write a Python program that takes a list of words from the user and writes them into a file. The program should stop when the user enters the word ‘quit’.

Code Section :

```
filename = 'words.txt'


# Open the file in write mode
with open(filename, 'w') as file:


    # Loop until the user enters 'quit'
    while True:
        word = input("Enter a word: ")


        # Write the word to the file
        file.write(word + '\n')


        # If the user enters 'quit', break out of the loop
        if word == 'quit':
            break


print(f"The words have been written to the file '{filename}'.")
```

Output Section :



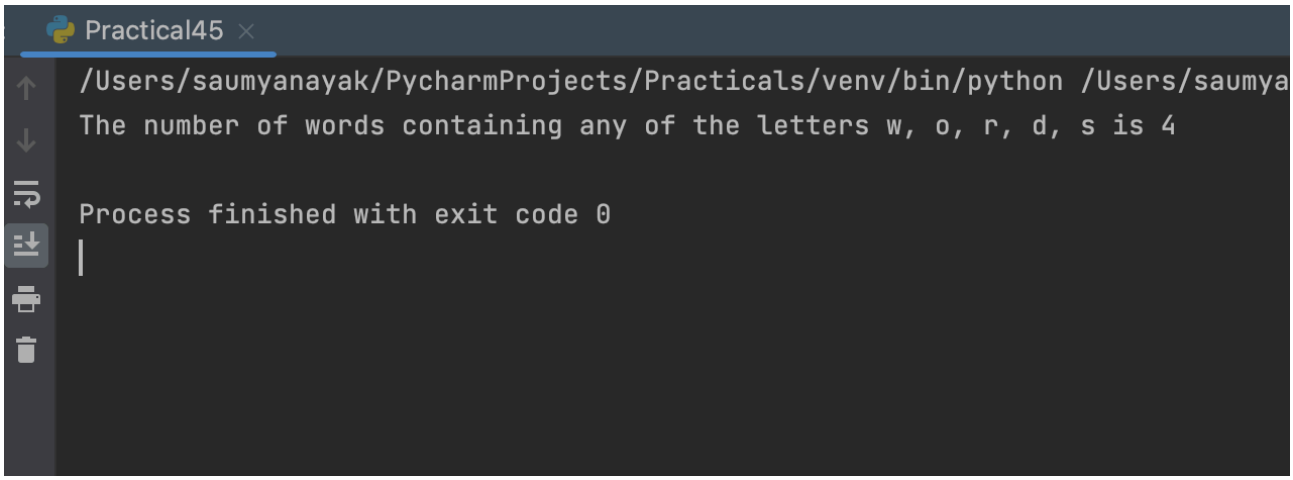
Practical No. 45

Program : Write a Python program that reads a file in text mode and counts the number of words that contain anyone of the letters [‘w’, ‘o’, ‘r’, ‘d’, ‘s’].

Code Section :

```
with open('words.txt', 'r') as file:
    word_count = 0
    for line in file:
        words = line.strip().split()
        for word in words:
            for letter in ['w', 'o', 'r', 'd', 's']:
                if letter in word:
                    word_count += 1
                    break

print(f'The number of words containing any of the letters w, o, r, d, s is {word_count}')
```

Output Section :



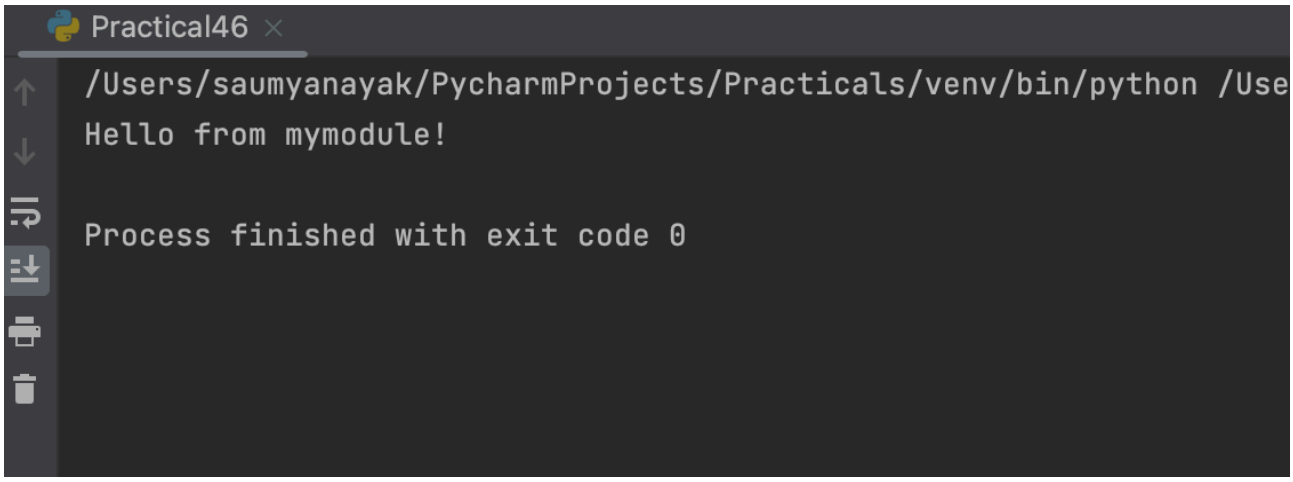
Practical No. 46

Program : Python programs to demonstrate the creation and use of “modules”.

Code Section :

```
//mymodule
def say_hello():
    print("Hello from mymodule!")


//importing module
import mymodule


mymodule.say_hello()
```

Output Section :



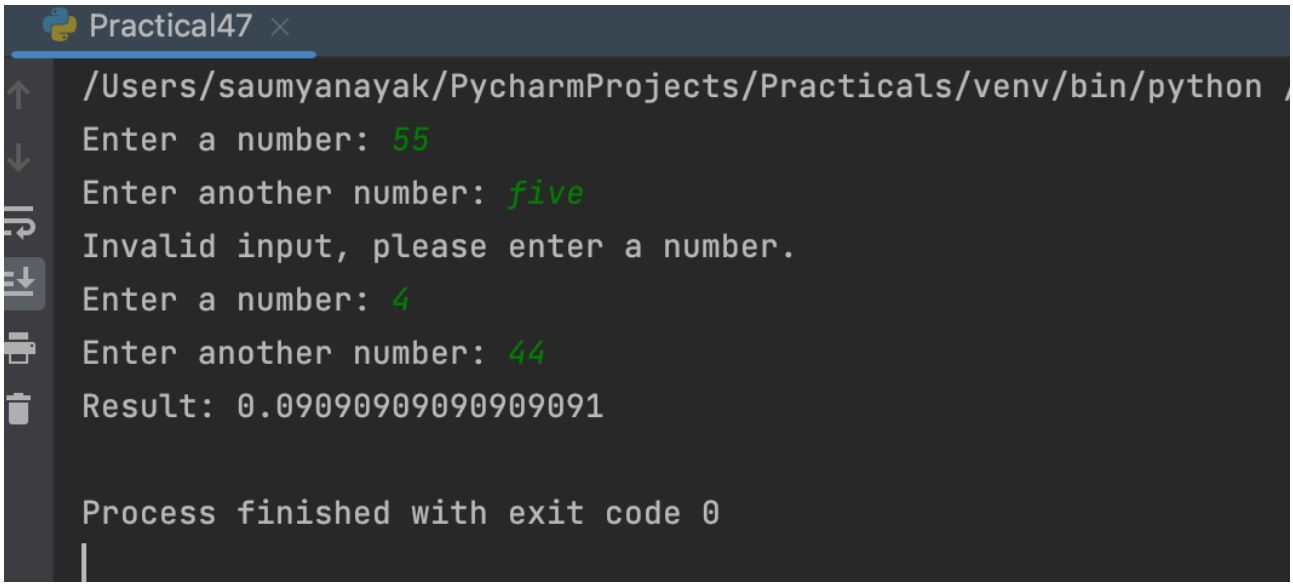
Practical No. 47

Program : Exception Handling Program that uses try and except.

Code Section :

```
while True:
    try:
        x = int(input("Enter a number: "))
        y = int(input("Enter another number: "))
        result = x / y
        print("Result:", result)
        break
    except ValueError:
        print("Invalid input, please enter a number.")
    except ZeroDivisionError:
        print("Cannot divide by zero, please enter a non-zero value for the second number.")
```

Output Section :



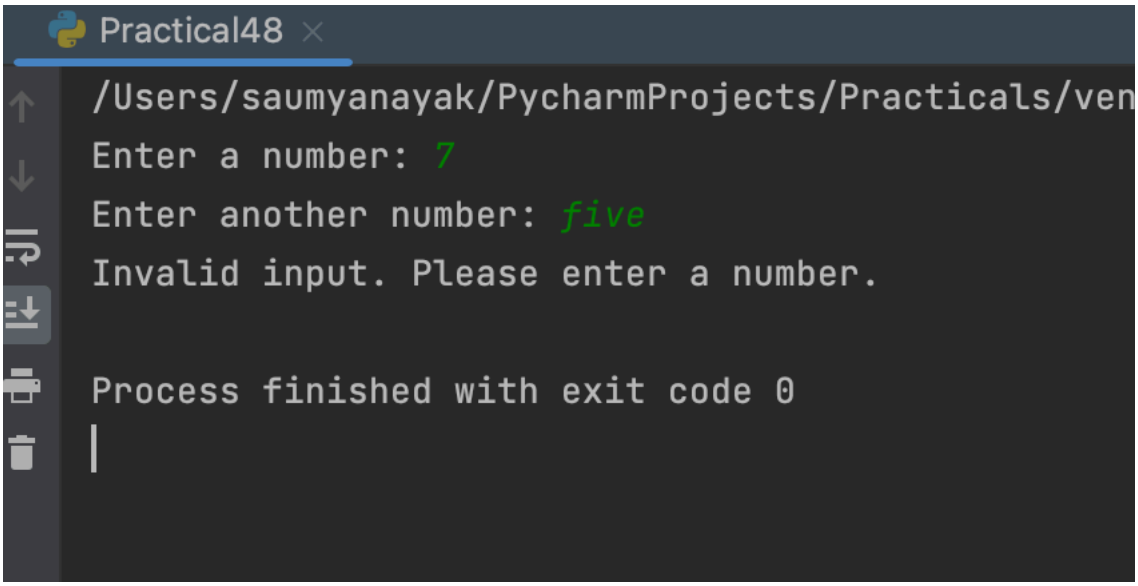
Practical No. 48

Program : Exception Handling Program that handles multiple types of exceptions.

Code Section :

```
try:
    # Code that may raise an exception
    num1 = int(input("Enter a number: "))
    num2 = int(input("Enter another number: "))
    result = num1 / num2
    print("The result is:", result)

except ValueError:
    print("Invalid input. Please enter a number.")

except ZeroDivisionError:
    print("Cannot divide by zero.")

except Exception as e:
    print("An error occurred:", e)
```

Output Section :



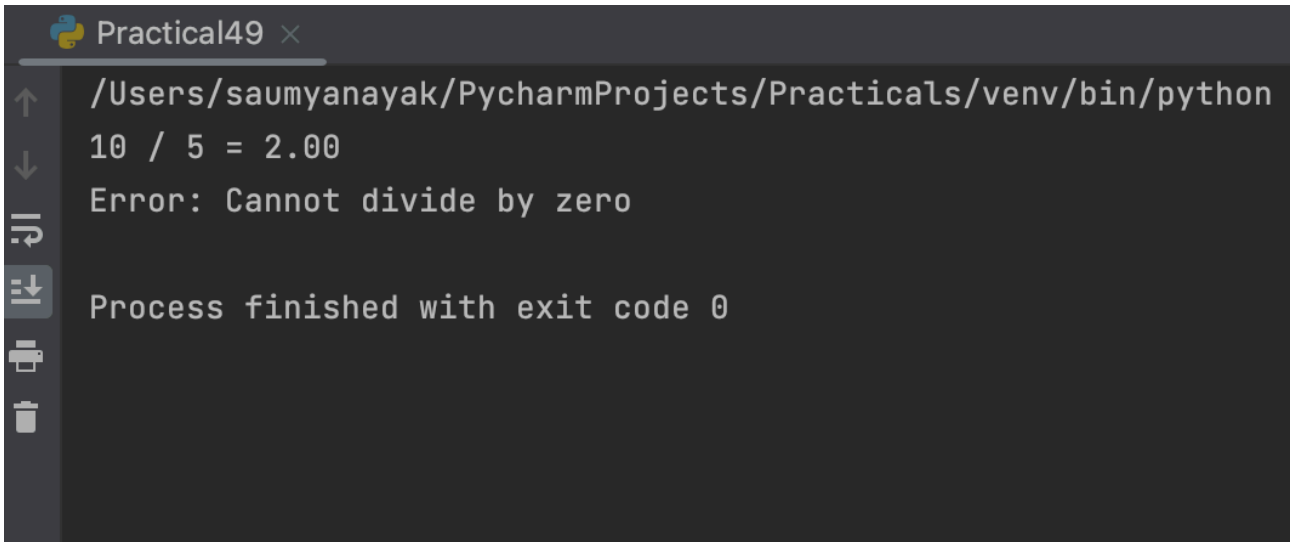
Practical No. 49

Program : Exception Handling Program that uses try, except and else.

Code Section :

```
def divide_numbers(a, b):
    try:
        result = a / b
    except ZeroDivisionError:
        print("Error: Cannot divide by zero")
    else:
        print(f"{a} / {b} = {result:.2f}")


# Example usage:
divide_numbers(10, 5) # Output: 10 / 5 = 2.00
divide_numbers(10, 0) # Output: Error: Cannot divide by zero
```

Output Section :



Practical No. 50

Program : Exception Handling Program that uses finally with try.

Code Section :

```
try:
    num = int(input("Enter a number: "))
    result = 10 / num
    print("Result:", result)
except ValueError:
    print("Invalid input. Please enter a number.")
except ZeroDivisionError:
    print("Cannot divide by zero.")
else:
    print("No exception occurred.")
finally:
    print("Program executed.")
```

Output Section :

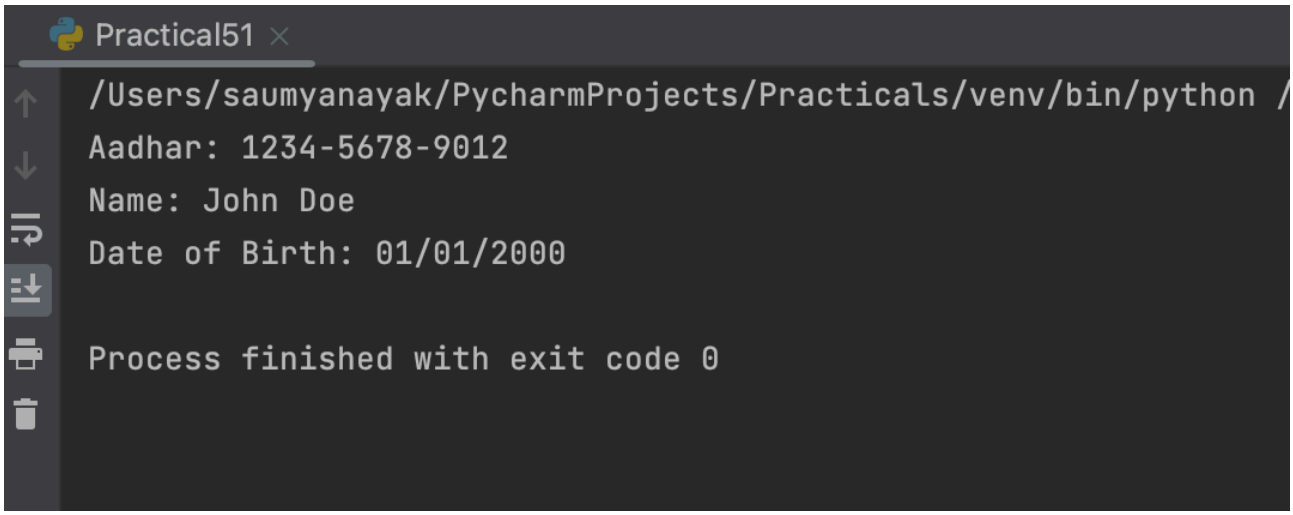
Practical No. 51

Program : Write a Python program that creates a class “Person”, with attributes [aadhar, name, DoB]

Code Section :

```
class Person:
    def __init__(self, aadhar, name, DoB):
        self.aadhar = aadhar
        self.name = name
        self.DoB = DoB

    def display(self):
        print("Aadhar:", self.aadhar)
        print("Name:", self.name)
        print("Date of Birth:", self.DoB)



# Create an instance of the Person class
p = Person("1234-5678-9012", "John Doe", "01/01/2000")


# Display the details of the person
p.display()
```

Output Section :



Practical No. 52

Program : Write a Python program that creates classes “Point” and “Rectangle” where the Rectangle class has a Point object as its attribute.

Code Section :

```
class Point:
    def __init__(self, x, y):
        self.x = x
        self.y = y


class Rectangle:
    def __init__(self, p1, p2):
        self.p1 = p1
        self.p2 = p2


    def area(self):
        width = abs(self.p2.x - self.p1.x)
        height = abs(self.p2.y - self.p1.y)
        return width * height


# example usage
p1 = Point(2, 3)
p2 = Point(5, 7)
rect = Rectangle(p1, p2)
print(rect.area()) # prints 12
```

Output Section :

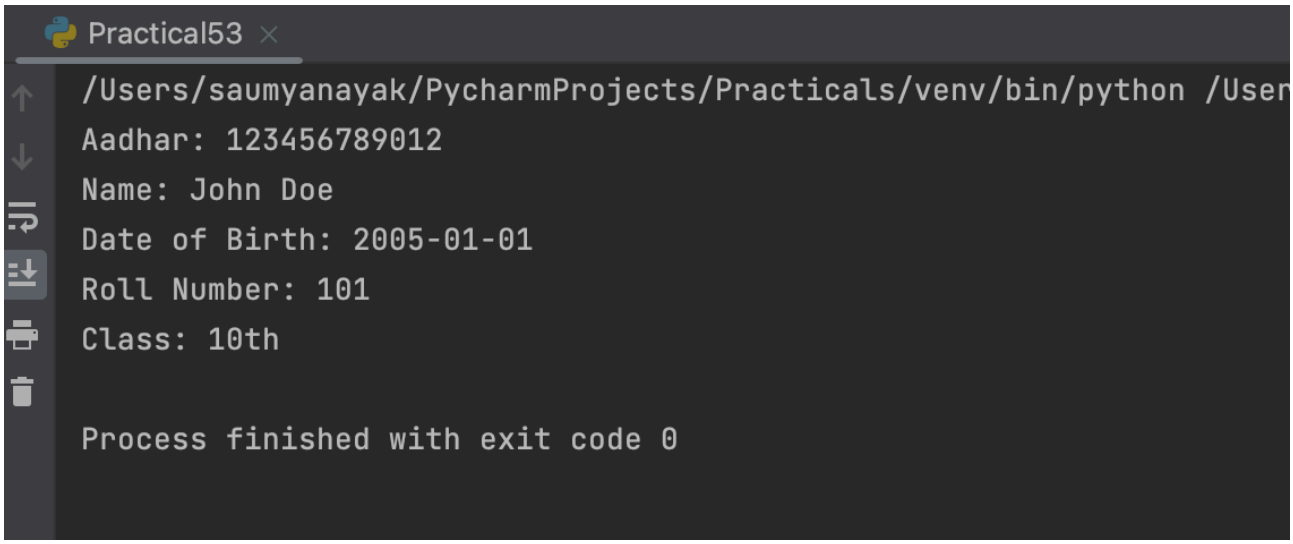
Practical No. 53

Program : Write a Python program that creates a class Students which inherits the properties of the “Person” class; add attributes [roll_no, class].

Code Section :

```
class Person:
    def __init__(self, aadhar, name, dob):
        self.aadhar = aadhar
        self.name = name
        self.dob = dob


class Students(Person):
    def __init__(self, aadhar, name, dob, roll_no, class_name):
        super().__init__(aadhar, name, dob)
        self.roll_no = roll_no
        self.class_name = class_name


    def display(self):
        print("Aadhar:", self.aadhar)
        print("Name:", self.name)
        print("Date of Birth:", self.dob)
        print("Roll Number:", self.roll_no)
        print("Class:", self.class_name)


# creating object of Students class and displaying its details
s = Students("123456789012", "John Doe", "2005-01-01", "101", "10th")
s.display()
```

Output Section :



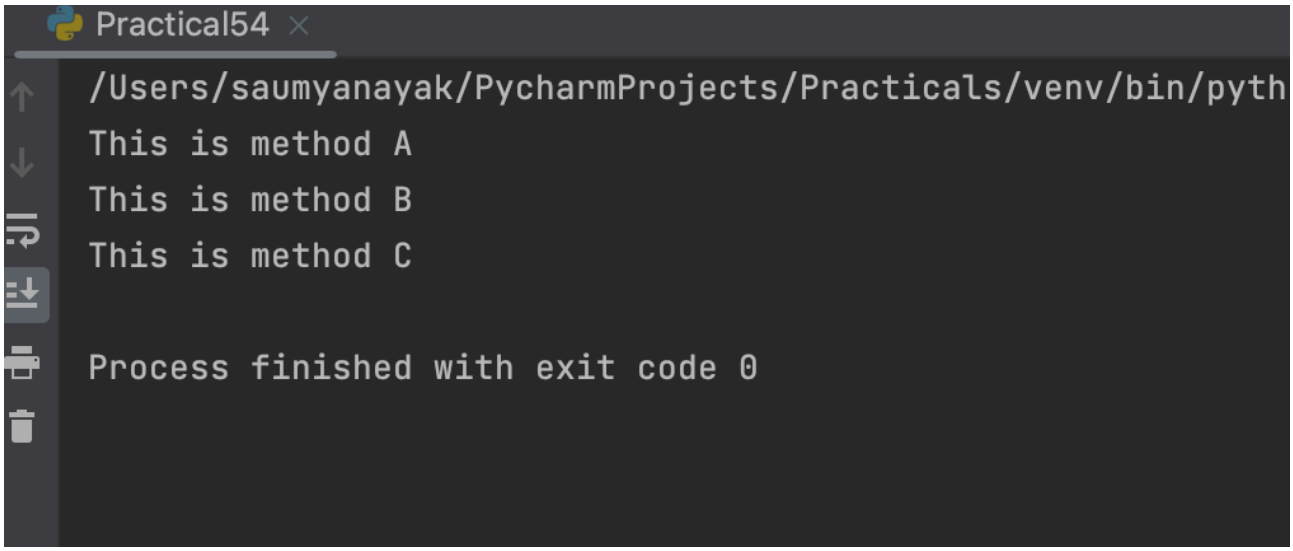
Practical No. 54

Program : Write a Python program to demonstrate “Multiple Inheritance”.

Code Section :

```
# Defining the parent classes
class A:
    def method_a(self):
        print("This is method A")

class B:
    def method_b(self):
        print("This is method B")

# Defining the child class which inherits from both A and B
class C(A, B):
    def method_c(self):
        print("This is method C")

# Creating an object of class C
obj = C()

# Calling the methods of A, B, and C using the object of C
obj.method_a()
obj.method_b()
obj.method_c()
```

Output Section :



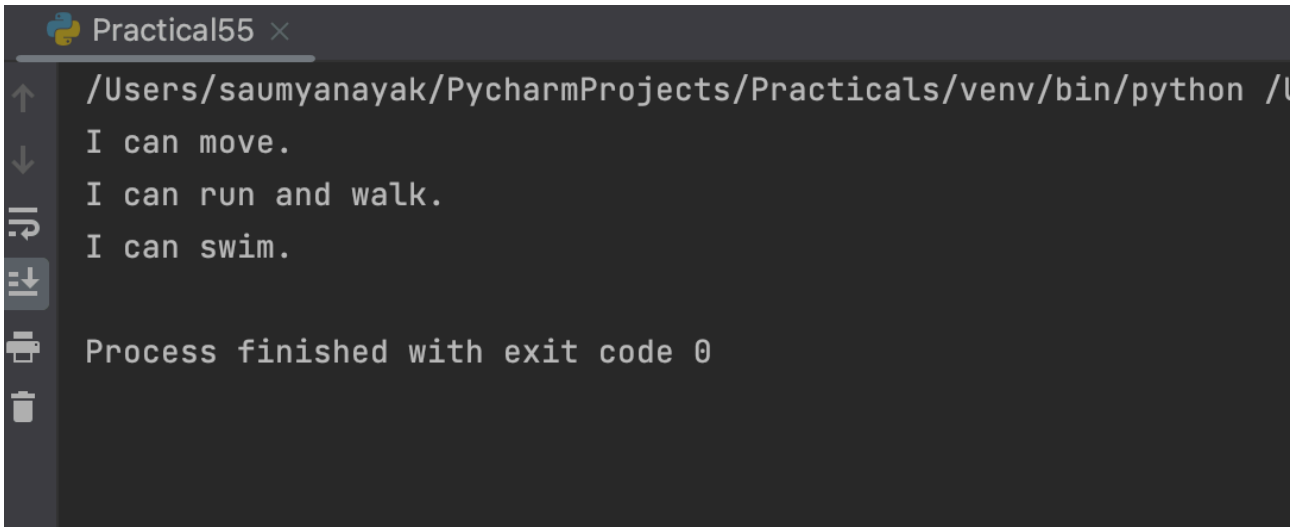
Practical No. 55

Program : Write a Python program to demonstrate “Method Overriding”.

Code Section :

```
class Animal:
    def move(self):
        print("I can move.")


class Dog(Animal):
    def move(self):
        print("I can run and walk.")


class Fish(Animal):
    def move(self):
        print("I can swim.")


# create objects of the classes
animal = Animal()
dog = Dog()
fish = Fish()


# call the move() method on each object
animal.move()   # prints "I can move."
dog.move()      # prints "I can run and walk."
fish.move()     # prints "I can swim."
```

Output Section :



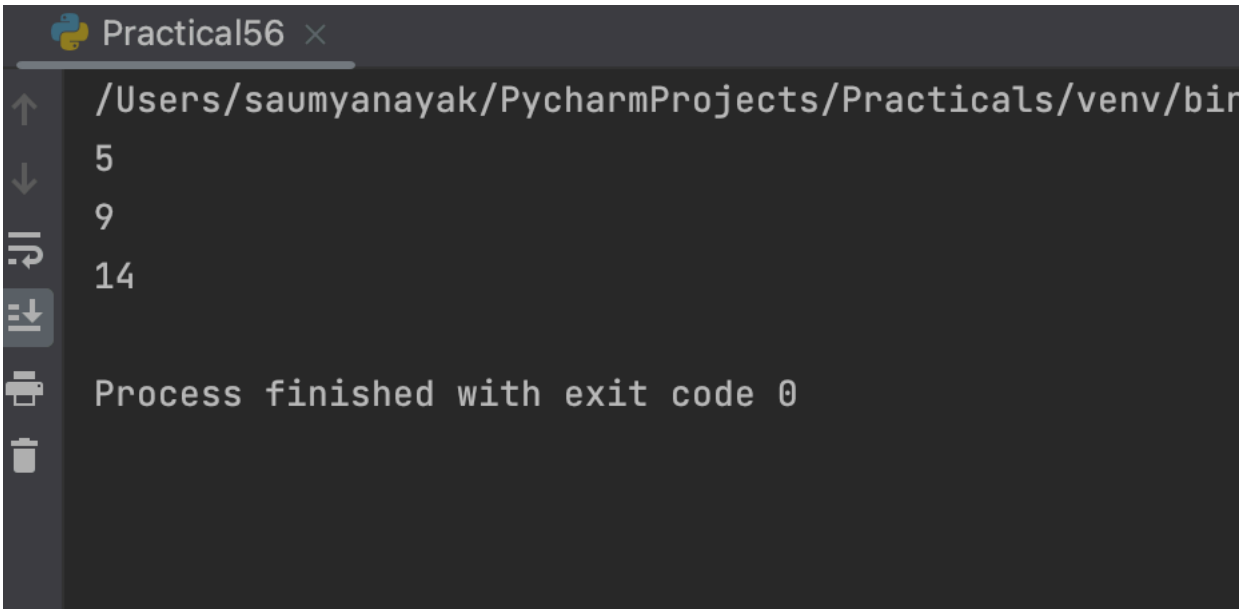
Practical No. 56

Program : Write a Python program to demonstrate “Method Overloading”.

Code Section :

```
class Calculator:
    def add(self, a, b, c=0, d=0):
        return a + b + c + d


calc = Calculator()


print(calc.add(2, 3))
print(calc.add(2, 3, 4))
print(calc.add(2, 3, 4, 5))
```

Output Section :



Practical No. 57

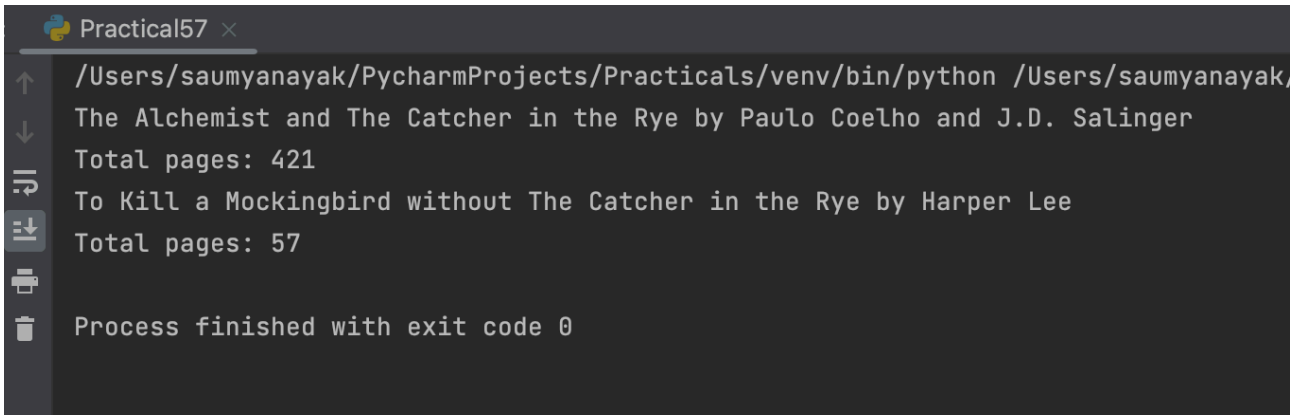
Program : Write a Python program to demonstrate “Operator Overloading” [+ and -] using a class “Book”.

Code Section :

```
class Book:
    def __init__(self, title, author, pages):
        self.title = title
        self.author = author
        self.pages = pages

    def __str__(self):
        return f"{self.title} by {self.author}"

    def __add__(self, other):
        new_title = f"{self.title} and {other.title}"
        new_author = f"{self.author} and {other.author}"
        new_pages = self.pages + other.pages
        return Book(new_title, new_author, new_pages)

    def __sub__(self, other):
        new_title = f"{self.title} without {other.title}"
        new_author = self.author
        new_pages = self.pages - other.pages
        return Book(new_title, new_author, new_pages)

book1 = Book("The Alchemist", "Paulo Coelho", 197)
```

```
book2 = Book("The Catcher in the Rye", "J.D. Salinger", 224)
book3 = Book("To Kill a Mockingbird", "Harper Lee", 281)

# adding two books
new_book = book1 + book2
print(new_book)
print(f"Total pages: {new_book.pages}")

# subtracting one book from another
new_book = book3 - book2
print(new_book)
print(f"Total pages: {new_book.pages}")
```

Output Section :



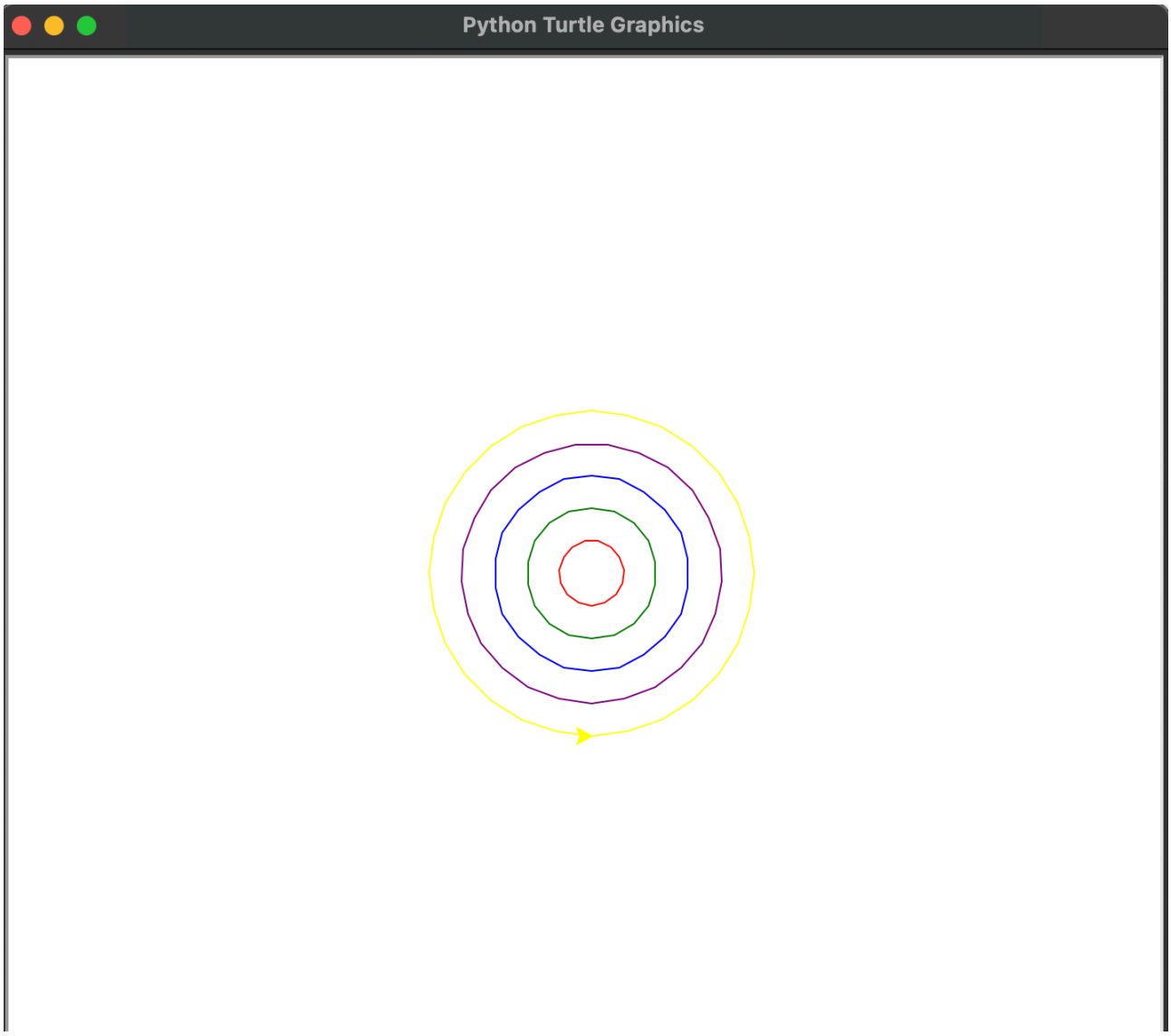
Practical No. 58

Program : Use the “turtle” module to draw concentric circles with different colours.

Code Section :

```
import turtle


colors = ["red", "green", "blue", "purple", "yellow"]
turtle.speed(0)


for i in range(5):
    turtle.color(colors[i])
    turtle.penup()
    turtle.goto(0, -i * 20)
    turtle.pendown()
    turtle.circle(20 * (i + 1))


turtle.done()
```

Output Section :



Practical No. 59

Program : Use the “turtle” module to print the multiplication table.

Code Section :

```
import turtle


# Set up the turtle
t = turtle.Turtle()
t.speed(0)


# Define a function to draw a single multiplication table
def draw_table(num, x, y):
    t.penup()
    t.goto(x, y)
    t.pendown()
    for i in range(1, 11):
        t.write("{} x {} = {}".format(num, i, num * i))
        t.penup()
        t.goto(x, y - i * 20)
        t.pendown()


# Draw the multiplication tables
for i in range(1, 11):
    draw_table(i, i * 50, 0)


# Keep the turtle window open
turtle.done()
```

Output Section :

1 x 1 = 1	2 x 1 = 2	3 x 1 = 3	4 x 1 = 4	5 x 1 = 5	6 x 1 = 6	7 x 1 = 7	8 x 1 = 8	9 x 1 = 9	10 x 1 = 10
1 x 2 = 2	2 x 2 = 4	3 x 2 = 6	4 x 2 = 8	5 x 2 = 10	6 x 2 = 12	7 x 2 = 14	8 x 2 = 16	9 x 2 = 18	10 x 2 = 20
1 x 3 = 3	2 x 3 = 6	3 x 3 = 9	4 x 3 = 12	5 x 3 = 15	6 x 3 = 18	7 x 3 = 21	8 x 3 = 24	9 x 3 = 27	10 x 3 = 30
1 x 4 = 4	2 x 4 = 8	3 x 4 = 12	4 x 4 = 16	5 x 4 = 20	6 x 4 = 24	7 x 4 = 28	8 x 4 = 32	9 x 4 = 36	10 x 4 = 40
1 x 5 = 5	2 x 5 = 10	3 x 5 = 15	4 x 5 = 20	5 x 5 = 25	6 x 5 = 30	7 x 5 = 35	8 x 5 = 40	9 x 5 = 45	10 x 5 = 50
1 x 6 = 6	2 x 6 = 12	3 x 6 = 18	4 x 6 = 24	5 x 6 = 30	6 x 6 = 36	7 x 6 = 42	8 x 6 = 48	9 x 6 = 54	10 x 6 = 60
1 x 7 = 7	2 x 7 = 14	3 x 7 = 21	4 x 7 = 28	5 x 7 = 35	6 x 7 = 42	7 x 7 = 49	8 x 7 = 56	9 x 7 = 63	10 x 7 = 70
1 x 8 = 8	2 x 8 = 16	3 x 8 = 24	4 x 8 = 32	5 x 8 = 40	6 x 8 = 48	7 x 8 = 56	8 x 8 = 64	9 x 8 = 72	10 x 8 = 80
1 x 9 = 9	2 x 9 = 18	3 x 9 = 27	4 x 9 = 36	5 x 9 = 45	6 x 9 = 54	7 x 9 = 63	8 x 9 = 72	9 x 9 = 81	10 x 9 = 90
1 x 10 = 10	2 x 10 = 20	3 x 10 = 30	4 x 10 = 40	5 x 10 = 50	6 x 10 = 60	7 x 10 = 70	8 x 10 = 80	9 x 10 = 90	10 x 10 = 100

Practical No. 60

Program : Use the “turtle” module to draw (not write) your name.

Code Section :

```
import turtle as t
t.pen
t.backward(200)
t.undo()
t.penup()
t.backward(250)
t.pendown()
#S
t.forward(50)
t.left(90)
t.forward(25)
t.left(90)
t.forward(50)
t.right(90)
t.forward(25)
t.right(90)
t.forward(50)
t.penup()
t.goto(150,0)
t.undo()
#A
t.goto(-150,0)
t.left(90)
```

```
t.pendown()
t.forward(50)
t.right(90)
t.forward(40)
t.right(90)
t.forward(50)
t.backward(50)
t.forward(25)
t.right(90)
t.forward(50)
t.undo()
t.forward(40)
t.penup()
#U
t.goto(-70,0)
t.right(90)
t.forward(50)
t.pendown()
t.backward(50)
t.right(90)
t.forward(40)
t.left(90)
t.forward(50)
#M
t.goto(20,0)
t.undo()
```

```
t.penup()
t.goto(20,0)
t.pendown()
t.forward(50)
t.right(90)
t.forward(20)
t.right(45)
t.forward(25)
t.left(90)
t.forward(25)
t.right(45)
t.forward(20)
t.right(90)
t.forward(50)
t.penup()
#Y
t.goto(120,0)
t.goto(140,0)
t.left(180)
t.pendown()
t.forward(25)
t.left(45)
t.forward(25)
t.backward(25)
t.right(90)
t.forward(25)
```

```
t.penup()
#A
t.goto(190,0)
t.left(45)
t.pendown()
t.forward(50)
t.right(90)
t.forward(40)
t.right(90)
t.forward(25)
t.right(90)
t.forward(40)
t.backward(40)
t.left(90)
t.forward(25)
```

Output Section :