Python Problem Solving Practical

Name: Anuj Gupta

Registration Number: 24BAI10152

# 1. Simple Calculator

Code:

a = 10  
b = 5  
print("Addition:", a + b)  
print("Subtraction:", a - b)  
print("Multiplication:", a \* b)  
print("Division:", a / b)

Output:

Addition: 15  
Subtraction: 5  
Multiplication: 50  
Division: 2.0

# 2. Area of the Triangle, Rectangle, Square, Circle

Code:

# Triangle (base=5, height=10)  
print("Area of Triangle:", 0.5 \* 5 \* 10)  
# Rectangle (length=5, width=3)  
print("Area of Rectangle:", 5 \* 3)  
# Square (side=4)  
print("Area of Square:", 4 \* 4)  
# Circle (radius=7, pi approximated as 3.14)  
print("Area of Circle:", 3.14 \* 7 \* 7)

Output:

Area of Triangle: 25.0  
Area of Rectangle: 15  
Area of Square: 16  
Area of Circle: 153.86

# 3. Quadratic Equation

Code:

a, b, c = 1, -3, 2  
d = (b\*\*2 - 4\*a\*c)\*\*0.5  
sol1 = (-b + d) / (2\*a)  
sol2 = (-b - d) / (2\*a)  
print("Solutions:", sol1, sol2)

Output:

Solutions: 2.0 1.0

# 4. Find the Given Number is ODD or Even

Code:

n = 7  
print("Even" if n % 2 == 0 else "Odd")

Output:

Odd

# 5. Find the Given Number is Positive or Negative

Code:

n = -5  
print("Positive" if n >= 0 else "Negative")

Output:

Negative

# 6. Given Character is Vowel or Consonant

Code:

ch = 'e'  
print("Vowel" if ch.lower() in 'aeiou' else "Consonant")

Output:

Vowel

# 7. Sum of the Digits

Code:

n = 456  
s = 0  
while n > 0:  
 s += n % 10  
 n //= 10  
print("Sum of digits:", s)

Output:

Sum of digits: 15

# 8. Armstrong Number

Code:

n = 153  
num = n  
s = 0  
while n > 0:  
 digit = n % 10  
 s += digit \*\* 3  
 n //= 10  
print("Armstrong" if s == num else "Not Armstrong")

Output:

Armstrong

# 9. Prime Number

Code:

n = 29  
flag = True  
if n <= 1:  
 flag = False  
else:  
 for i in range(2, n):  
 if n % i == 0:  
 flag = False  
 break  
print("Prime" if flag else "Not Prime")

Output:

Prime

# 10. Fibonacci Series

Code:

a, b = 0, 1  
count = 0  
while count < 10:  
 print(a, end=' ')  
 a, b = b, a + b  
 count += 1  
print()

Output:

0 1 1 2 3 5 8 13 21 34

# 11. Swapping Values

Code:

a, b = 5, 10  
# Temporary  
temp = a  
a = b  
b = temp  
print("Temp Swap:", a, b)  
# Without Temp  
a, b = b, a  
print("No Temp Swap:", a, b)

Output:

Temp Swap: 10 5  
No Temp Swap: 5 10

# 12. Summation(n)

Code:

n = 5  
s = 0  
for i in range(1, n+1):  
 s += i  
print("Summation:", s)

Output:

Summation: 15

# 13. Summation(n square)

Code:

n = 5  
s = 0  
for i in range(1, n+1):  
 s += i \* i  
print("Summation of squares:", s)

Output:

Summation of squares: 55

# 14. Factorial (simple and recursive)

Code:

def factorial(n):  
 result = 1  
 for i in range(2, n+1):  
 result \*= i  
 return result  
  
def rec\_factorial(n):  
 if n <= 1:  
 return 1  
 return n \* rec\_factorial(n-1)  
  
print("Factorial:", factorial(5))  
print("Recursive Factorial:", rec\_factorial(5))

Output:

Factorial: 120  
Recursive Factorial: 120

# 15. Reverse Integer and String

Code:

num = 12345  
string = "hello"  
rev\_num = 0  
while num > 0:  
 rev\_num = rev\_num \* 10 + num % 10  
 num //= 10  
print("Reversed Number:", rev\_num)  
print("Reversed String:", string[::-1])

Output:

Reversed Number: 54321  
Reversed String: olleh

# 16. Base Conversion

Code:

num = 25  
binary = ""  
n = num  
while n > 0:  
 binary = str(n % 2) + binary  
 n //= 2  
print("Binary:", binary)

Output:

Binary: 11001

# 17. ASCII Conversion

Code:

ch = 'A'  
print("ASCII of", ch, "is", ord(ch))

Output:

ASCII of A is 65

# 18. Square Root

Code:

n = 64  
sqrt = 0  
i = 0  
while i\*i <= n:  
 sqrt = i  
 i += 1  
print("Square root:", sqrt)

Output:

Square root: 8

# 19. GCD

Code:

a, b = 48, 18  
while b != 0:  
 a, b = b, a % b  
print("GCD:", a)

Output:

GCD: 6

# 20. LCM

Code:

a, b = 4, 6  
max\_num = max(a, b)  
while True:  
 if max\_num % a == 0 and max\_num % b == 0:  
 print("LCM:", max\_num)  
 break  
 max\_num += 1

Output:

LCM: 12

# 21. Operation on Random Numbers

Code:

nums = [10, 20, 30, 40, 50]  
print("Sum:", sum(nums))  
print("Max:", max(nums))  
print("Min:", min(nums))

Output:

Sum: 150  
Max: 50  
Min: 10

# 22. Operation on List

Code:

lst = [1, 2, 3]  
lst.append(4)  
lst.remove(2)  
print("List:", lst)

Output:

List: [1, 3, 4]

# 23. Operation on Sets

Code:

s = set([1, 2, 3])  
s.add(4)  
s.discard(2)  
print("Set:", s)

Output:

Set: {1, 3, 4}

# 24. Operation on Dictionary

Code:

d = {'a': 1, 'b': 2}  
d['c'] = 3  
del d['a']  
print("Dictionary:", d)

Output:

Dictionary: {'b': 2, 'c': 3}

# 25. Operation on Arrays (using list)

Code:

arr = [1, 2, 3, 4]  
arr.append(5)  
arr.remove(2)  
print("Array:", arr)

Output:

Array: [1, 3, 4, 5]