Practical - 3

Aim:

Implement the programs using iterative statements and string operations.

Q1: Write a program to check if number is Armstrong.

Code:

```
number = input("Enter Number to check if Number is Armstrong: ")
len_num = len(number)
sum = 0
for i in range(len_num):
  sum += int(number[i])**len_num

if sum == int(number):
  print("Number is Armstrong")
else:
  print("Number is not Armstrong")
```

Output:

```
Enter Number to check if Number is Armstrong: 153
Number is Armstrong
```

Q2: Write a program to check special number. (Number is equal to the sum of its divisors).

Code:

```
number = int(input("Enter Number to check if Number is Perfect: "))
sum = 0
for i in range(1,number):
  if number % i == 0:
    sum += i

if sum == int(number):
  print("Number is Perfect")
else:
  print("Number is not Perfect")
```

Output:

```
Enter Number to check if Number is Perfect: 496
Number is Perfect
```

Q3: Create a program that will print out words that start with 's' from the below given statement.

- st='Print only the words that start with s in this sentence'

Code:

```
st = 'Print only the words that start with s in this sentence'
words = st.split()
for i in range(len(words)):
  if words[i].startswith('s'):
    print(words[i])
```

Output:

```
start
s
sentence
```

Q4: Write a program to give output of entered number multiplication table.

Code:

```
number = int(input("Enter Number: "))
for i in range(1, 11):
  print(f"{number} x {i} = {number*i}")
```

Output:

```
Enter Number: 5
5 x 1 = 5
5 x 2 = 10
5 x 3 = 15
5 x 4 = 20
5 x 5 = 25
5 x 6 = 30
5 x 7 = 35
5 x 8 = 40
5 x 9 = 45
5 x 10 = 50
```

Q5: Write a program to find the sum of digit of an input number using while loop.

Code:

```
number = int(input("Enter Number: "))
sum = 0
while number > 0:
  sum += number % 10
  number = int(number/10)

print(sum)
```

Output:

```
Enter Number: 145
10
```

Q6: Go to String below and if the length of a word is even print "even!".

- st='I love doing python programming in spyder'

Code:

```
st='I love doing python programming in spyder'
if len(st.split()) % 2 == 0:
  print("Even!")
else:
  print("Odd!")
```

Output:

```
Odd!
```

Q7: Write a program to count number of digits, upper-case characters and lower-case characters from the string.

Code:

```
st= input("Enter String :")
count_num = 0
count_lower = 0
count_upper = 0
count_symbol = 0
for i in range(len(st)):
  if st[i] == ' ':
    continue
  elif st[i] >= '0' and st[i] <= '9':
    count_num += 1
  elif st[i] >= 'A' and st[i] <= 'Z':
    count_upper += 1
  elif st[i] >= 'a' and st[i] <= 'z':
    count_lower += 1
  else:
    count_symbol += 1

print(f"""
Numbers: {count_num}
Lower : {count_lower}
Upper : {count_upper}
Symbol : {count_symbol}
""")
```

Output:

```
Enter String :I love doing python 134 @# programming in spyder


Numbers: 3
Lower : 34
Upper : 1
Symbol : 2
```

Q8: Write a python program to check if a string is a palindrome or not.

Code:

```
string = input("Enter String to Check if it is Palindrome: ")

if string == string[::-1]:
  print("String is Palindrome")
else:
  print("String is Not Palindrome")
```

Output:

```
Enter String to Check if it is Palindrome: racecar
String is Palindrome
```

Q9: Write a python program to remove i'th character from string.

Code:

```
st = input("Enter String: ")
idx_ch = int(input("Enter idx you want to Remove: "))

st = list(st)
st.pop(idx_ch)

st = ''.join(st)

print(st)
```

Output:

```
Enter String: 0123456789
Enter idx you want to Remove: 5
012346789
```

Q10: Write a python program to check if the substring is present in a given string.

Code:

```
st = input("Enter String: ")
sub_string = input("Enter Sub-string to find in string: ")

# We can also use .index() method but that will raise error so it is not best for checking substring

print(f"""
Is SubString in String (Using in Method): {sub_string.lower() in st.lower()}
Is SubString in String (Using find Method): {st.lower().find(sub_string.lower())}
Is SubString in String (Using count Method): {st.lower().count(sub_string.lower())}
""")
```

Output:

```
Enter String: I am Vatsal
Enter Sub-string to find in string: vatsal


Is SubString in String (Using in Method): True
Is SubString in String (Using find Method): 5
Is SubString in String (Using count Method): 1
```

Practice Exercise:

1. Write a program to generate Fibonacci series up to n terms where each number contains exactly 3 digits. For example, if a Fibonacci number is 89, display it as 089. If it exceeds 999, don't display it.

Code:

```
fib = [0, 1]
while fib[-1]+fib[-2] < 1000:
  fib.append(fib[-1]+fib[-2]);

formatted_st = "[" + ", ".join(str(i).zfill(3) for i in fib) + "]"

print(st)
```

Output:

```
[000, 001, 001, 002, 003, 005, 008, 013, 021, 034, 055, 089, 144,
233, 377, 610, 987]
```

2. Create a program that takes a sentence as input and performs the following operations:

- Count total words
- Display words containing exactly 5 characters
- Print the position of each vowel in the sentence

Code:

```
st = input("Enter String: ")

word_count = len(st.split())

size_5_word = []
for i in st.split():
  if len(i) == 5:
    size_5_word.append(i)


# for index of vowels
vowels = ['a', 'e', 'i', 'o', 'u']
idx_vowels = []
for idx, ch in enumerate(st):
  if ch.lower() in vowels:
    idx_vowels.append(idx)

print(f"""
Word Count: {word_count}
5 size word: {size_5_word}
id of vowels: {idx_vowels}
""")
```

Output:

```
Enter String: There is no one who loves pain itself, who seeks
after it and wants to have it, simply because it is pain...

Word Count: 22
5 size word: ['There', 'loves', 'seeks', 'after', 'wants']
id of vowels: [2, 4, 6, 10, 12, 14, 18, 21, 23, 27, 28, 31, 34, 41,
44, 45, 49, 52, 55, 58, 63, 69, 72, 74, 76, 81, 88, 90, 91, 93, 95,
98, 102, 103]
```

3. Write a program that takes a string input and creates a new string by replacing:

- all vowels with '*'
- all digits with '#'
- all spaces with '_'

Display both original and modified strings.

Code:

```
st = input("Enter String: ")
orignal_st = st
st = list(st)

vowels = ['a', 'e', 'i', 'o', 'u']

for i in range(len(st)):
  if st[i] in vowels:
    st[i] = '*'
  elif st[i] >= '0' and st[i] <= '9':
    st[i] = '#'
  elif st[i] == ' ':
    st[i] = '_'

st = ''.join(st)

print(f"""
Orignal String: {orignal_st}
Modified String: {st}
""")
```

Output:

```
Enter String: I love doing python 134 @# programming in spyder


Orignal String: I love doing python 134 @# programming in spyder
Modified String: I_l*v*_d**ng_pyth*n_###_@#_pr*gr*mm*ng_*n_spyd*r
```

4. Develop a program that takes a word and displays it in the following pattern (example for word 'PYTHON'):

P

PY

PYT

PYTH

PYTHO

PYTHON

PYTHO

PYTH

PYT

PY

P

Code:

```
st = input("Enter String: ")
len_st = len(st)

for i in range(len_st):
  print(st[:i+1])

for i in range(len_st -1):
  print(st[:-1-i])
```

Output:

```
Enter String: PYTHON
P
PY
PYT
PYTH
PYTHO
PYTHON
PYTHO
PYTH
PYT
PY
P
```

5. Write a program that takes a string containing both words and numbers (e.g., 'I have 2 cars and 3 bikes'). Extract all numbers, find their sum, and replace each number in the original string with its square. Display:

- Sum of all numbers
- Modified string (e.g., 'I have 4 cars and 9 bikes')

Code:

```
st = input("Enter String: ")
st = st.split()
sum_of_numbers = 0

for i in range(len(st)):
  if st[i].isnumeric():
    sum_of_numbers += int(st[i])
    st[i] = str(int(st[i]) ** 2)

st = ' '.join(st)
print(f"""
Sum of All Numbers: {sum_of_numbers}
Modified String: {st}
""")
```

Output:

```
Enter String: I have 2 cars and 3 bikes


Sum of All Numbers: 5
Modified String: I have 4 cars and 9 bikes
```