Python lab 3

ROLL NUMBER: 112315119
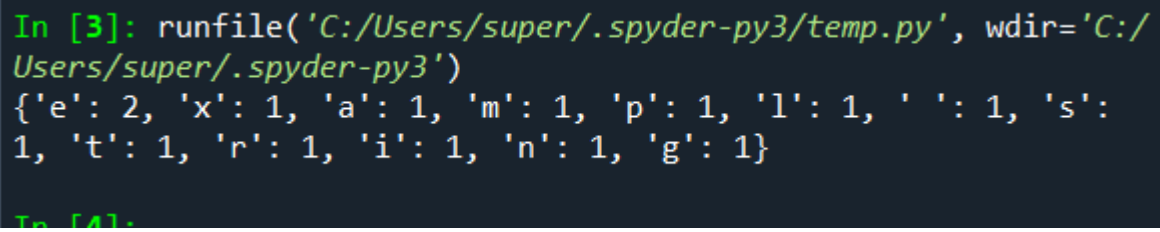**NAME: Om Arun Thombre**

1.

```python
def char_count(s):
    d = {}
    for c in s:
        d[c] = d.get(c, 0) + 1
    return d

s = "example string"
print(char_count(s))
```

OUTPUT:

```
In [3]: runfile('C:/Users/super/.spyder-py3/temp.py', wdir='C:/
Users/super/.spyder-py3')
{'e': 2, 'x': 1, 'a': 1, 'm': 1, 'p': 1, 'l': 1, ' ': 1, 's':
1, 't': 1, 'r': 1, 'i': 1, 'n': 1, 'g': 1}

In [4]:
```

2.

```python
def trace_birthday(name):
    bdays = {"Alice": "01-01-1990", "Bob": "12-05-1985"}
    return bdays.get(name, "Birthday not found")

s = "this is a test string"
split_s = s.split()
joined_s = "-".join(split_s)

print(split_s)
print(joined_s)
print(trace_birthday("Alice"))
```

OUTPUT:

```
In [4]: runfile('C:/Users/super/.spyder-py3/temp.py', wdir='C:/
Users/super/.spyder-py3')
['this', 'is', 'a', 'test', 'string']
this-is-a-test-string
01-01-1990

In [5]:
```

3.

```python
def gcd(a, b):
    while b:
        a, b = b, a % b
    return a

def lcm(a, b):
    return abs(a * b) // gcd(a, b)

a, b = 12, 18
print(gcd(a, b))
print(lcm(a, b))
```

OUTPUT:

```
Console 1/A X

Python 3.8.10 (tags/v3.8.10:3d8993a, May  3 2021, 11:48:03)
[MSC v.1928 64 bit (AMD64)]
Type "copyright", "credits" or "license" for more information.

IPython 8.12.3 -- An enhanced Interactive Python.

In [1]: runfile('C:/Users/super/.spyder-py3/temp.py', wdir='C:/
Users/super/.spyder-py3')
6
36
```

4.
```python
def ball_collide(b1, b2):
    dist = ((b1[0] - b2[0]) ** 2 + (b1[1] - b2[1]) ** 2) ** 0.5
    return dist <= (b1[2] + b2[2])

ball1 = (0, 0, 5)
ball2 = (3, 4, 3)

collision = ball_collide(ball1, ball2)
print(collision)
```

OUTPUT:

```
In [7]: runfile('C:/Users/super/.spyder-py3/temp.py', wdir='C:/
Users/super/.spyder-py3')
True
```

5.

```python
from statistics import mean, median, mode

nums = [1, 2, 3, 4, 4, 5, 5, 5, 6]

mean_val = mean(nums)
median_val = median(nums)
mode_val = mode(nums)

print(f"Mean: {mean_val}")
print(f"Median: {median_val}")
print(f"Mode: {mode_val}")
```

OUTPUT:

```
In [2]: runfile('C:/Users/super/.spyder-py3/temp.py', wdir='C:/
Users/super/.spyder-py3')
Mean: 3.888888888888889
Median: 4
Mode: 5
```

6.

```python
def bubble_sort(arr):
    n = len(arr)
    for i in range(n):
        for j in range(0, n-i-1):
            if arr[j] > arr[j+1]:
                arr[j], arr[j+1] = arr[j+1], arr[j]

def merge_sort(arr):
    if len(arr) > 1:
        mid = len(arr) // 2
        L = arr[:mid]
        R = arr[mid:]
        merge_sort(L)
        merge_sort(R)
        i = j = k = 0
        while i < len(L) and j < len(R):
            if L[i] < R[j]:
                arr[k] = L[i]
                i += 1
            else:
                arr[k] = R[j]
                j += 1
            k += 1
        while i < len(L):
            arr[k] = L[i]
            i += 1
            k += 1
        while j < len(R):
            arr[k] = R[j]
            j += 1
            k += 1

def selection_sort(arr):
    for i in range(len(arr)):
        min_idx = i
        for j in range(i+1, len(arr)):
            if arr[j] < arr[min_idx]:
                min_idx = j
        arr[i], arr[min_idx] = arr[min_idx], arr[i]

def insertion_sort(arr):
    for i in range(1, len(arr)):
```

```python
        key = arr[i]
        j = i-1
        while j >= 0 and key < arr[j]:
            arr[j+1] = arr[j]
            j -= 1
        arr[j+1] = key

def sort_switch_case(choice, arr):
    if choice == 1:
        bubble_sort(arr)
    elif choice == 2:
        merge_sort(arr)
    elif choice == 3:
        selection_sort(arr)
    elif choice == 4:
        insertion_sort(arr)
    return arr

arr = [64, 25, 12, 22, 11]
print('''
    1. Bubble sort
    2. Merge sort
    3. Selection sort
    4. Insertion sort
    ''')
choice = int(input("Enter choice:"))
sorted_arr = sort_switch_case(choice, arr)
print(sorted_arr)
```

OUTPUT:

```
In [6]: runfile('C:/Users/super/.spyder-py3/temp.py', wdir='C:/
Users/super/.spyder-py3')

    1. Bubble sort
    2. Merge sort
    3. Selection sort
    4. Insertion sort

Enter choice:1
[11, 12, 22, 25, 64]
```