GURUDEV ARTS AND SCIENCE COLLEGE

MATHIL, PAYYANUR, KANNUR DIST.

(Affiliated to Kannur University)

BACHELOR OF COMPUTER APPLICATION

PYTHON PROGRAMMING

PRACTICAL RECORD

Name :

Register No :

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DEPARTMENT OF COMPUTER SCIENCE

Certified that this is the bonafide record of practical work done by ___________________________ of III BCA at Gurudev Arts and College, Mathil for the year 2024 to 2025.

Lecture Charge:

Head Of Dept. Computer Science

Submitted for University Examinations 2025

Examiner: 1.

2.

TABLE OF CONTENTS

Q: Write a program to find the largest from a list of numbers:

```
def find_largest(numbers):
    if not numbers:
        return None  # Return None if the list is empty

    largest = numbers[0]  # Assume the first number is the largest

    for number in numbers:
        if number > largest:
            largest = number  # Update largest if the current number is bigger

    return largest

# Example usage:
numbers = [10, 24, 5, 37, 42, 18, 4]
largest_number = find_largest(numbers)
print("The largest number is:", largest_number)
```

OUTPUT:

```
The largest number is: 42
```

Q:Write a program to generate first n perfect numbers

```
def is_perfect_number(number):
    if number < 2:
        return False
    divisors_sum = sum(divisor for divisor in range(1, number) if number %
divisor == 0)
    return divisors_sum == number

def generate_perfect_numbers(n):
    perfect_numbers = []
    candidate = 2  # Start checking from 2
    while len(perfect_numbers) < n:
        if is_perfect_number(candidate):
            perfect_numbers.append(candidate)
        candidate += 1
    return perfect_numbers

# Example usage:
n = 4
perfect_numbers = generate_perfect_numbers(n)
print(f"The first {n} perfect numbers are:", perfect_numbers)
```

OUTPUT:

```
The first 4 perfect numbers are: [6, 28, 496, 8128]
```

Q: Write a program to perform the binary search

```
def binary_search(sorted_list, target):
    left = 0
    right = len(sorted_list) - 1

    while left <= right:
        mid = (left + right) // 2
        mid_value = sorted_list[mid]

        if mid_value == target:
            return mid  # Target found, return its index
        elif mid_value < target:
            left = mid + 1  # Continue search in the right half
        else:
            right = mid - 1  # Continue search in the left half

    return -1  # Target not found

# Example usage:
sorted_list = [1, 3, 5, 7, 9, 11, 13, 15, 17, 19]
target = 7
result = binary_search(sorted_list, target)

if result != -1:
    print(f"Target {target} found at index {result}.")
else:
    print(f"Target {target} not found in the list.")
```

OUTPUT:

```
Target 7 found at index 3.
```

Q: Write a program to find the square root of a number using bisection search method

```
def bisection_sqrt(x, epsilon=1e-10):
    if x < 0:
        raise ValueError("Cannot compute the square root of a negative number.")

    if x == 0 or x == 1:
        return x

    low = 0
    high = max(1, x)
    guess = (low + high) / 2.0

    while abs(guess**2 - x) > epsilon:
        if guess**2 < x:
            low = guess
        else:
            high = guess
        guess = (low + high) / 2.0

    return guess

# Example usage:
number = 25
result = bisection_sqrt(number)
print(f"The square root of {number} is approximately {result}.")
```

OUTPUT:

```
The square root of 25 is approximately 4.9999999999954525.
```

Q: Write a program to generate Fibonacci series using recursion

```
def fibonacci(n):
    if n <= 0:
        raise ValueError("The input number must be a positive integer.")
    if n == 1:
        return 0
    if n == 2:
        return 1
    return fibonacci(n - 1) + fibonacci(n - 2)

def generate_fibonacci_series(length):
    if length <= 0:
        raise ValueError("The length of the series must be a positive integer.")
    series = []
    for i in range(1, length + 1):
        series.append(fibonacci(i))
    return series

# Example usage:
length = 10
series = generate_fibonacci_series(length)
print(f"The first {length} numbers in the Fibonacci series are: {series}")
```

OUTPUT:

```
The first 10 numbers in the Fibonacci series are: [0, 1, 1, 2, 3, 5, 8, 13, 21, 34]
```

Q: Write a program to find the LCM and GCD of 2 numbers

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

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

# Example usage:
num1 = 12
num2 = 18

gcd_result = gcd(num1, num2)
lcm_result = lcm(num1, num2)

print(f"The GCD of {num1} and {num2} is {gcd_result}.")
print(f"The LCM of {num1} and {num2} is {lcm_result}.")
```

OUTPUT:

```
The GCD of 12 and 18 is 6.
The LCM of 12 and 18 is 36.
```

Q: Write a program to perform merge sort

```
def merge_sort(arr):
    if len(arr) <= 1:
        return arr

    # Find the middle point to divide the array into two halves
    mid = len(arr) // 2

    # Call merge_sort for the first half
    left_half = merge_sort(arr[:mid])

    # Call merge_sort for the second half
    right_half = merge_sort(arr[mid:])

    # Merge the two halves sorted in step 2 and 3
    return merge(left_half, right_half)

def merge(left, right):
    merged = []
    left_index, right_index = 0, 0

    # Traverse both arrays and insert smaller of both elements in merged array
    while left_index < len(left) and right_index < len(right):
        if left[left_index] < right[right_index]:
            merged.append(left[left_index])
            left_index += 1
        else:
            merged.append(right[right_index])
            right_index += 1

    # Collect remaining elements (if any)
    merged.extend(left[left_index:])
    merged.extend(right[right_index:])

    return merged

# Example usage:
arr = [38, 27, 43, 3, 9, 82, 10]
sorted_arr = merge_sort(arr)
print(f"Sorted array: {sorted_arr}")
```

OUTPUT:

```
Sorted array: [3, 9, 10, 27, 38, 43, 82]
```

Q: Write a program which reads the contents of a file and copy the contents to another file after changing all the letter to upper case. Exceptions should be handled.

```
try:
    # Open the source file in read mode
    with open("input.txt", "r") as f1:
        # Read the contents of the source file
        content = f1.read()

    # Convert content to uppercase
    upper_content = content.upper()

    # Open the destination file in append mode and write the uppercase content
    with open("output.txt", "a") as f2:
        f2.write(upper_content)

    # Open the destination file in read mode and print its contents
    with open("output.txt", "r") as f2:
        for x in f2.read():
            print(x, end="")

except IOError:
    print("Error: can't find file or read data")
```

<u>OUTPUT:</u>

```
THE THINGS WE COULD HAVE SHARED,BECAUSE IN THAT MOMENT
I KNEW THAT OF ALL THE PEOPLE IN THE WORLD,
THERE WAS ONLY ONE I WANTED TO BE WITH, AND IT WAS HER.
```

Q: Write a program to find the prime numbers in a list of numbers

```
numberList = [0, 1, 2, 3, 4, 5, 6, 7, 8, 9, 10]
ansList = []

for num in numberList:
    # Check for numbers less than 2
    if num <= 1:
        continue

    # Assume num is prime until proven otherwise
    is_prime = True

    # Check for factors from 2 to sqrt(num)
    for i in range(2, int(num**0.5) + 1):
        if num % i == 0:
            is_prime = False
            break

    # If no factors were found, num is prime
    if is_prime:
        ansList.append(num)

# Print the result
if ansList:
    print("Prime Numbers:")
    for ans in ansList:
        print(ans)
else:
    print("No number in the given list is Prime")
```

OUTPUT:

```
Prime Numbers:
2
3
5
7
```

Q: Write a python program to perform the following

- **a) Create table students with fields name,sex,rollno,marks.**
- **b) Insert some rows into the table**
- **c) Update the marks of all students by adding 2 marks.**
- **d) Delete a student with a given rollno.**
- **e) Display the details of a student with a given rollno.**

```
import mysql.connector

# Establish a connection to the database
mydb = mysql.connector.connect(
    host="localhost",
    user="yourusername",
    password="yourpassword",
    database="mydatabase"
)

mycursor = mydb.cursor()

# a) Create table students with fields name, sex, rollno, marks
mycursor.execute("""
CREATE TABLE IF NOT EXISTS students (
    rollno INT PRIMARY KEY,
    name VARCHAR(30),
    sex VARCHAR(1),
    marks INT
)
""")

# b) Insert some rows into the table
sql = "INSERT INTO students (rollno, name, sex, marks) VALUES (%s, %s,
%s, %s)"
val = [
    (1, 'Peter', 'M', 49),
    (2, 'Diya', 'F', 40),
    (3, 'Manu', 'M', 39),
    (4, 'Anjali', 'F', 45),
    (5, 'Manas', 'M', 48)
]
mycursor.executemany(sql, val)
mydb.commit()
print(mycursor.rowcount, "record(s) inserted.")
```

```
# c) Update the marks of all students by adding 2 marks
sql = "UPDATE students SET marks = marks + 2"
mycursor.execute(sql)
mydb.commit()
print(mycursor.rowcount, "record(s) updated.")

# Display all records after the update
mycursor.execute("SELECT * FROM students")
myresult = mycursor.fetchall()
print("Students after update:")
for x in myresult:
    print(x)

#d) Delete a student with a given rollno
rno = int(input('Enter the roll number of student to delete: '))
sql = "DELETE FROM students WHERE rollno = %s"
mycursor.execute(sql, (rno,))
mydb.commit()
print(mycursor.rowcount, "record(s) deleted.")

# e) Display the details of a student with a given rollno
rno = int(input('Enter the roll number of student to display the details: '))
sql = "SELECT * FROM students WHERE rollno = %s"
mycursor.execute(sql, (rno,))
myresult = mycursor.fetchall()
print("Student details:")
if myresult:
    for x in myresult:
        print(x)
else:
    print("No student found with the given roll number.")

# Close the cursor and connection
mycursor.close()
mydb.close()
```

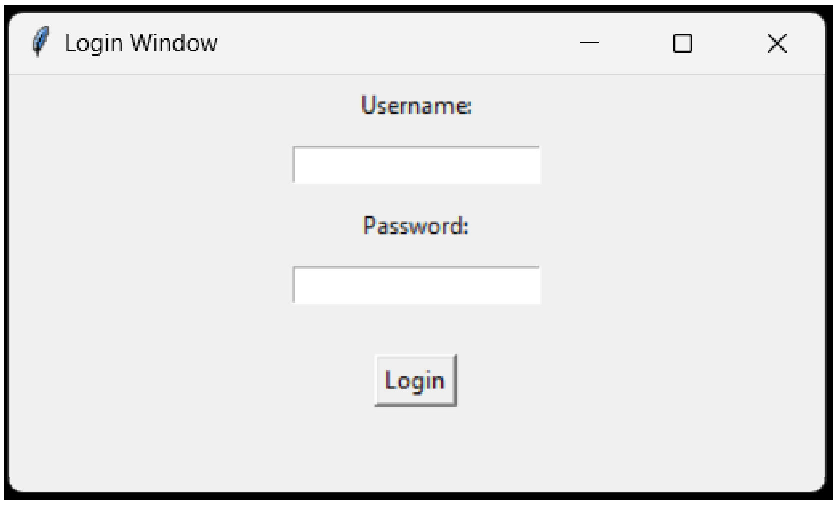
OUTPUT:

```
5 record(s) inserted.
5 record(s) updated.
Students after update:
(1, 'Peter', 'M', 51)
(2, 'Diya', 'F', 42)
(3, 'Manu', 'M', 41)
(4, 'Anjali', 'F', 47)
(5, 'Manas', 'M', 50)
Enter the roll number of student to delete: 3
1 record(s) deleted.
Enter the roll number of student to display the details: 2
Student details:
(2, 'Diya', 'F', 42)
```

Q: Create a simple Login window using Tkinter

```
import tkinter as tk
from tkinter import messagebox

# Function to handle the login logic
def login():
    username = entry_username.get()
    password = entry_password.get()

    # Simple validation logic (you can replace this with actual authentication)
    if username == "user" and password == "password":
        messagebox.showinfo("Login Successful", "Welcome, " + username + "!")
    else:
        messagebox.showerror("Login Failed", "Invalid username or password")

# Create the main application window
root = tk.Tk()
root.title("Login Window")

# Set window size
root.geometry("300x150")

# Create and place the username label and entry field
label_username = tk.Label(root, text="Username:")
label_username.pack(pady=5)

entry_username = tk.Entry(root)
entry_username.pack(pady=5)

# Create and place the password label and entry field
label_password = tk.Label(root, text="Password:")
label_password.pack(pady=5)

entry_password = tk.Entry(root, show="*")
entry_password.pack(pady=5)

# Create and place the login button
login_button = tk.Button(root, text="Login", command=login)
login_button.pack(pady=20)

# Run the application
root.mainloop()
```

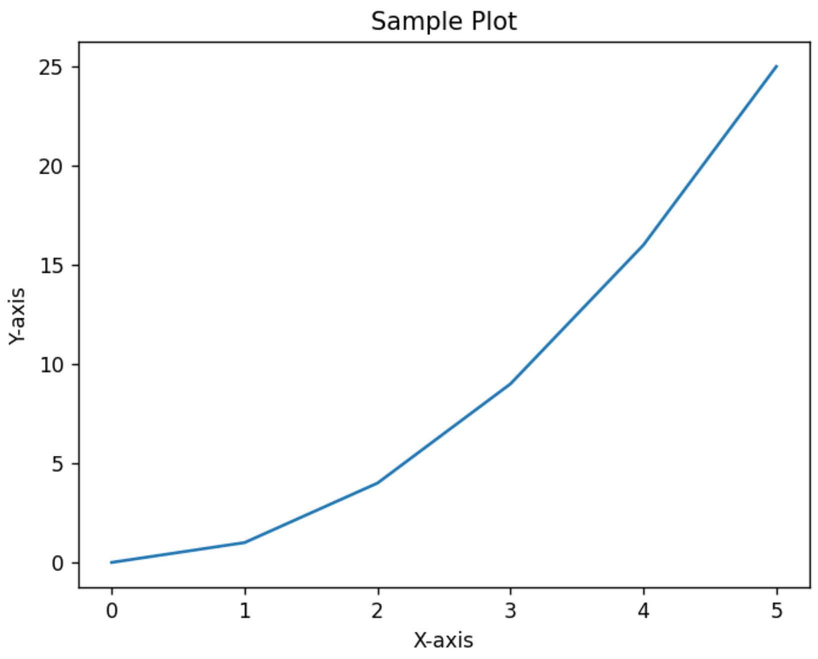
OUTPUT:



Q: Create a plot in Python. The title of the plot and the axes should be labelled.

```
import matplotlib.pyplot as plt

# Sample data
x = [0, 1, 2, 3, 4, 5]
y = [0, 1, 4, 9, 16, 25]

# Create a plot
plt.plot(x, y)

# Add title and labels
plt.title("Sample Plot")
plt.xlabel("X-axis")
plt.ylabel("Y-axis")

# Show the plot
plt.show()
```

<u>OUTPUT:</u>


Sample Plot
Y-axis
X-axis