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batch:06

SCHOOL OF COMPUTER SCIENCE AND ARTIFICIAL INTELLIGENCE		DEPARTMENT OF COMPUTER SCIENCE ENGINEERING	
ProgramName:B. Tech		Assignment Type: Lab	AcademicYear:2025-2026
CourseCoordinatorName		Venkataramana Veeramsetty	
Instructor(s)Name		1. Dr. Mohammed Ali Shaik 2. Dr. T Sampath Kumar 3. Mr. S Naresh Kumar 4. Dr. V. Rajesh 5. Dr. Brij Kishore 6. Dr Pramoda Patro 7. Dr. Venkataramana 8. Dr. Ravi Chander 9. Dr. Jagjeeth Singh	
CourseCode	24CS002PC215	CourseTitle	AI Assisted Coding
Year/Sem	II/I	Regulation	R24
Date and Day of Assignment		Time(s)	
Duration	2 Hours	Applicableto Batches	
AssignmentNumber:3.3(Present assignment number)/24(Total number of assignments)			

Q.No.	Question	Expected Time to complete
1	<p>Lab 3: Prompt Engineering – Improving Prompts and Context Management</p> <p>Lab Objectives:</p> <ul style="list-style-type: none">To understand how prompt structure and wording influence AI-generated code.To explore how context (like comments and function names) helps AI generate relevant output.To evaluate the quality and accuracy of code based on prompt clarity.To develop effective prompting strategies for AI-assisted programming. <p>Lab Outcomes (LOs): After completing this lab, students will be able to:</p> <ul style="list-style-type: none">Generate Python code using Google Gemini in Google Colab.Analyze the effectiveness of code explanations and suggestions by Gemini.Set up and use Cursor AI for AI-powered coding assistance.Evaluate and refactor code using Cursor AI features.Compare AI tool behavior and code quality across different platforms.	03.08.2025 EOD

Task Description#1

- Try 3 different prompts to generate a factorial function.

Expected Output#1

- Comparison of AI-generated code styles

Prompt:

Write a program to calculate the factorial of a number using functions

Code:

```
def factorial(n):  
    if n < 0:  
        return None # Factorial is not defined for negative numbers  
    elif n == 0 or n == 1:  
        return 1  
    else:  
        result = 1  
        for i in range(2, n + 1):  
            result *= i  
        return result  
  
# Input from user  
num = int(input("Enter a number to find its factorial: "))  
  
fact = factorial(num)  
if fact is None:  
    print("Factorial is not defined for negative numbers.")  
else:  
    print(f"The factorial of {num} is: {fact}")
```

Output:

Enter a number to find its factorial: 5
The factorial of 5 is: 120

Prompt:

Write a recursive function in Python to find the factorial of a number.

Code:

```
def factorial(n):
    if n < 0:
        return None # Factorial is not defined for negative numbers
    elif n == 0 or n == 1:
        return 1
    else:
        return n * factorial(n - 1)

# Input from user
num = int(input("Enter a number to find its factorial: "))

fact = factorial(num)
if fact is None:
    print("Factorial is not defined for negative numbers.")
else:
    print(f"The factorial of {num} is: {fact}")
```

Output:

```
Enter a number to find its factorial: 6
The factorial of 6 is: 720
```

Prompt:

Write a Python function to calculate factorial, and handle edge cases like 0, negative numbers, and non-integers.

Code:

```
def factorial(n):
    if not isinstance(n, int):
        raise TypeError("Input must be an integer.")
    if n < 0:
        raise ValueError("Factorial is not defined for negative numbers.")
    if n == 0 or n == 1:
        return 1
    return n * factorial(n - 1)

# Input from user
try:
    num = float(input("Enter a number to find its factorial: "))
    if not num.is_integer():
        raise ValueError("Input must be an integer.")
    num = int(num)
    fact = factorial(num)
    print(f"The factorial of {num} is: {fact}")
except (ValueError, TypeError) as e:
    print(f"Error: {e}")
```

Output:

```
Enter a number to find its factorial: 0
The factorial of 0 is: 1
Enter a number to find its factorial: -3
Error: Factorial is not defined for negative numbers.
```

Task Description#2

- Provide a clear example input-output prompt to generate a sorting function.

Expected Output#2

- Functional sorting code from AI

Prompt:

create a python code input-output to generate a sorting function

Code:

```
def sort_numbers(numbers):  
    """  
    Sorts a list of numbers in ascending order.  
    """  
    return sorted(numbers)  
  
# Input from user  
try:  
    user_input = input("Enter numbers separated by spaces: ")  
    num_list = [float(num) for num in user_input.strip().split()]  
    sorted_list = sort_numbers(num_list)  
    print("Sorted numbers:", sorted_list)  
except ValueError:  
    print("Error: Please enter valid numbers separated by spaces.")
```

Output:

```
Enter numbers separated by spaces: 1 2 4 5 6 3  
Sorted numbers: [1.0, 2.0, 3.0, 4.0, 5.0, 6.0]
```

Task Description#3

- Start with the vague prompt "Generate python code to calculate power bill" and improve it step-by-step

Expected Output#3

- Enhanced AI output with clearer prompts

Prompt:

Generate python code to calculate power bill

Code:

```
def calculate_power_bill(units):
    """
    Calculates the power bill based on units consumed.
    Example slab:
    - First 100 units: Rs. 1.5/unit
    - Next 100 units (101-200): Rs. 2.5/unit
    - Above 200 units: Rs. 4/unit
    """
    if units < 0:
        raise ValueError("Units cannot be negative.")
    bill = 0
    if units <= 100:
        bill = units * 1.5
    elif units <= 200:
        bill = 100 * 1.5 + (units - 100) * 2.5
    else:
        bill = 100 * 1.5 + 100 * 2.5 + (units - 200) * 4
    return bill

# Input from user
try:
    units = float(input("Enter the number of units consumed: "))
    total_bill = calculate_power_bill(units)
    print(f"Total power bill for {units} units is: Rs. {total_bill:.2f}")
except ValueError as e:
    print(f"Error: {e}")
```

Output:

```
Enter the number of units consumed: -50
Error: Units cannot be negative.
Enter the number of units consumed: 60
Total power bill for 60.0 units is: Rs. 90.00
```

Task Description#4

- Write structured comments to help AI generate two linked functions (e.g., login_user() and register_user()).

Expected Output#4

- Consistent functions with shared logic

Prompt:

```
write a python code that will linked two functions (e.g.,
login_user() and register_user()) and get output
```

Code:

```

users_db = {}

def register_user():
    username = input("Enter a username to register: ")
    if username in users_db:
        print("Username already exists. Try logging in.")
        return False
    password = input("Enter a password: ")
    users_db[username] = password
    print("Registration successful!")
    return True

def login_user():
    username = input("Enter your username: ")
    password = input("Enter your password: ")
    if users_db.get(username) == password:
        print("Login successful!")
        return True
    else:
        print("Invalid username or password.")
        return False

def main():
    while True:
        print("\n1. Register\n2. Login\n3. Exit")
        choice = input("Choose an option: ")
        if choice == '1':
            register_user()
        elif choice == '2':
            login_user()
        elif choice == '3':
            print("Exiting program.")
            break
        else:
            print("Invalid choice. Try again.")

if __name__ == "__main__":
    main()

```

Output:

```
1. Register
2. Login
3. Exit
Choose an option: 1
Enter a username to register: sai
Enter a password: 1234
Registration successful!
```

```
1. Register
2. Login
3. Exit
Choose an option: 2
Enter your username: sai
Enter your password: 1234
Login successful!
```

```
1. Register
2. Login
3. Exit
Choose an option: 3
Exiting program.
```

Task Description#5

- Analyzing Prompt Specificity: Improving Temperature Conversion Function with Clear Instructions

Expected Output#5

- Code quality difference analysis for various prompts

Prompt:

```
write a python code that will do Conversion of
Temperature using Function
```

Code:

```

def celsius_to_fahrenheit(celsius):
    return (celsius * 9/5) + 32

def fahrenheit_to_celsius(fahrenheit):
    return (fahrenheit - 32) * 5/9

def main():
    while True:
        print("\nTemperature Conversion Menu:")
        print("1. Celsius to Fahrenheit")
        print("2. Fahrenheit to Celsius")
        print("3. Exit")
        choice = input("Choose an option: ")
        if choice == '1':
            c = float(input("Enter temperature in Celsius: "))
            f = celsius_to_fahrenheit(c)
            print(f"{c}°C = {f:.2f}°F")
        elif choice == '2':
            f = float(input("Enter temperature in Fahrenheit: "))
            c = fahrenheit_to_celsius(f)
            print(f"{f}°F = {c:.2f}°C")
        elif choice == '3':
            print("Exiting program.")
            break
        else:
            print("Invalid choice. Try again.")

if __name__ == "__main__":
    main()

```

Output:


```
Temperature Conversion Menu:
1. Celsius to Fahrenheit
2. Fahrenheit to Celsius
3. Exit
Choose an option: 1
Enter temperature in Celsius: 50
50.0°C = 122.00°F
```

```
Temperature Conversion Menu:
1. Celsius to Fahrenheit
2. Fahrenheit to Celsius
3. Exit
Choose an option: 2
Enter temperature in Fahrenheit: 130
130.0°F = 54.44°C
```

```
Temperature Conversion Menu:
1. Celsius to Fahrenheit
2. Fahrenheit to Celsius
3. Exit
Choose an option: 3
Exiting program.
```

Note: Report should be submitted a word document for all tasks in a single document with prompts, comments & code explanation, and output and if required, screenshots

Evaluation Criteria:

Criteria	Max Marks
Factorial Function (Task#1)	0.5
Sorting Function (Task#2)	0.5
Vogue Vs. Specific Prompting (Task #3)	0.5
Linked Functions (Task #4)	0.5
Temperature Conversion Function (Task #5)	0.5
Total	2.5 Marks