ASSIGNMENT – 6.4

2303A51197

Batch-10

Task-1

Prompt: Create a Python class named Student that includes attributes for name, roll number, and marks. Add one method to show student details and another method to determine, using if-else, whether the student's marks are higher than the class average. Accept input from the user.

Code :

```
class Student:     def __init__(self, name,
roll_number, marks):
        self.name = name
self.roll_number = roll_number
self.marks = marks     def
display_details(self):
        print(f"Name: {self.name}")
print(f"Roll Number: {self.roll_number}")
print(f"Marks: {self.marks}")     def
is_above_average(self, average_marks):
if self.marks > average_marks:
            return f"{self.name} is above the class average."
else:
            return f"{self.name} is not above the class
average." students = [] num_students = int(input("Enter the
number of students: ")) for _ in range(num_students):
    name = input("Enter student's name: ")
roll_number = input("Enter student's roll number: ")
marks = float(input("Enter student's marks: "))
students.append(Student(name, roll_number, marks))
total_marks = sum(student.marks for student in
students) average_marks = total_marks / num_students
print(f"\nClass Average Marks: {average_marks:.2f}\n")
for student in students:
    student.display_details()
print(student.is_above_average(average_marks))
print()   Output :
```

```python
class Student:
    def __init__(self, name, roll_number, marks):
        self.name = name
        self.roll_number = roll_number
        self.marks = marks

    def show_details(self):
        print(f"Name: {self.name}")
```

```
PROBLEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS

PS C:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig> & C:/Users/PRAKASH/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/
Enter username: prakash
Enter password: 12345
Login successful: False
PS C:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig> & C:/Users/PRAKASH/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/
Enter the student's name: prakash
Enter the student's roll number: 2303A51197
Enter the student's marks: 99
Enter the class average marks: 85
Name: prakash
Roll Number: 2303A51197
Marks: 99.0
PS C:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig>
```

Code Analysis :

- Defines a Student class with name, roll number, and marks as attributes.
- Uses methods to display student details and compare marks with class average.
- Takes user input to create multiple student objects and stores them in a list.
- Calculates class average using total marks and number of students.
- Uses if-else to check whether a student is above average

Task-2

Prompt: Write a Python program that takes sensor readings from the user, loops through them using a for loop, checks for even values with the modulus operator, computes their squares, and displays the output clearly.

Code :

```
sensor_readings = list(map(int, input("Enter sensor readings separated by spaces: ").split())) for reading in sensor_readings:     if reading % 2 == 0:
        square = reading ** 2
        print(f"Sensor Reading: {reading}, Square: {square}")
```

Output :

```python
#Write a Python program that takes sensor readings from the user, loops through them using a for loop, checks for even values with t
# Accept sensor readings from the user
sensor_readings = input("Enter sensor readings separated by commas: ")
# Split the input into a list of readings
readings_list = sensor_readings.split(",")
# Loop through the readings and check for even values
for reading in readings_list:
    try:
        value = float(reading.strip())
        if value % 2 == 0:
            square = value ** 2
            print(f"Even value: {value}, Square: {square}")
    except ValueError:
        print(f"Invalid input: {reading.strip()} is not a number.")
#example input: 10, 15, 20, 25, 30
```

```
LEMS  OUTPUT  DEBUG CONSOLE  TERMINAL  PORTS
lid input:  is not a number.
lid input:  is not a number.
:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig> & C:/Users/PRAKASH/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/PR
r the student's name: Traceback (most recent call last):
le "c:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig\lab_6.4.py", line 19, in <module>
# name = input("Enter the student's name: ")
       ^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^^
oardInterrupt
:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig> & C:/Users/PRAKASH/AppData/Local/Microsoft/WindowsApps/python3.11.exe "c:/Users/PR
r sensor readings separated by commas: 10,20,30,40,50
 value: 10.0, Square: 100.0
 value: 20.0, Square: 400.0
 value: 30.0, Square: 900.0
 value: 40.0, Square: 1600.0
 value: 50.0, Square: 2500.0
:\Users\PRAKASH\OneDrive\Desktop\Ai assisted codig>
```

Code Analysis :

- Takes multiple sensor readings as user input in a list format.
- Uses a for loop to iterate through each sensor reading.
- Applies the modulus operator (%) to identify even numbers.
- Calculates the square of even readings using the exponent operator.
- Prints the reading and its square in a clear format.

Task-3

Prompt: Develop a Python class called BankAccount with account holder name and balance as attributes. Include methods for depositing and withdrawing money, ensuring withdrawals are restricted when funds are insufficient using if-else conditions, and take user input.

Code :

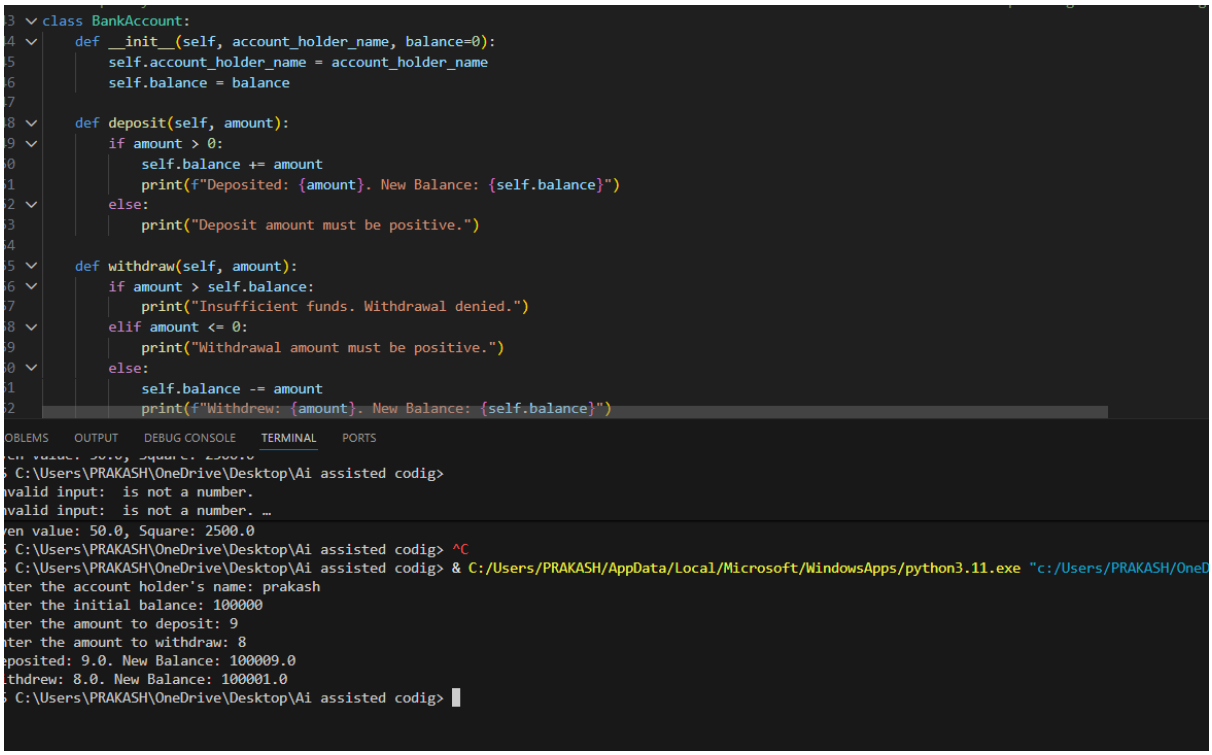
```
class BankAccount:    def __init__(self,
account_holder, initial_balance=0):
        self.account_holder =
account_holder        self.balance =
```

```
initial_balance     def deposit(self,
amount):         if amount > 0:
            self.balance += amount
print(f"Deposited: ${amount}")
        else:
            print("Deposit amount must be positive.")
def withdraw(self, amount):         if 0 < amount <=
self.balance:
            self.balance -= amount
print(f"Withdrew: ${amount}")
        else:
            print("Insufficient balance or invalid withdrawal amount.")
def check_balance(self):
        print(f"Current balance: ${self.balance}")
account_holder = input("Enter account holder's name: ")
initial_balance = float(input("Enter initial balance: "))
account = BankAccount(account_holder, initial_balance)
while True:
    action = input("Choose an action: deposit, withdraw, check balance, or exit: ").lower()
if action == "deposit":
        amount = float(input("Enter amount to deposit: "))
account.deposit(amount)     elif action == "withdraw":
amount = float(input("Enter amount to withdraw: "))
account.withdraw(amount)
    elif action == "check balance":
account.check_balance()     elif
action == "exit":
```

print("Exiting the program.") break

else: print("Invalid action. Please choose

again.") Output :



Code Analysis :

- Creates a BankAccount class with account holder name and balance.
- Includes methods for deposit, withdrawal, and balance checking.
- Uses if-else to prevent withdrawals with insufficient balance.
- Accepts user input through a menu-driven while loop.
- Ensures valid banking operations and safe program exit.

Task-4

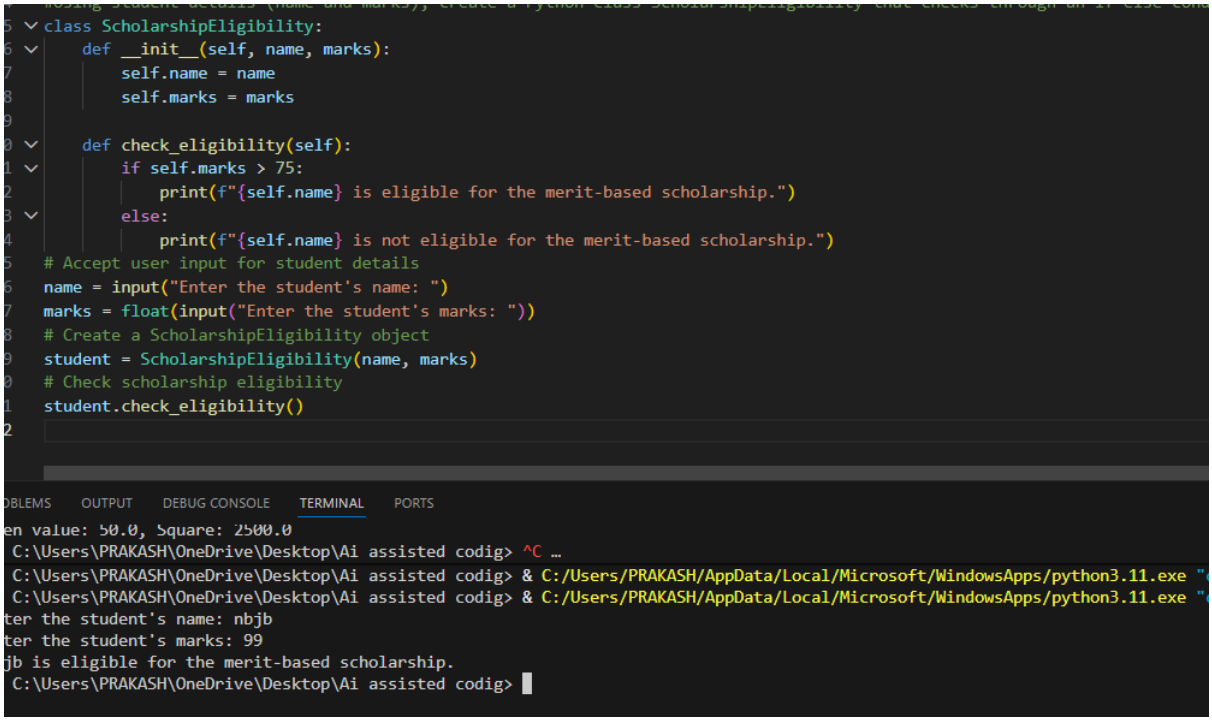
Prompt: Using student details (name and marks), create a Python class ScholarshipEligibility that checks through an if-else condition whether a student qualifies for a merit-based scholarship (marks above 75) and display the result based on user input.a

class ScholarshipEligibility: def __init__(self, name, marks):

```
        self.name = name
self.marks = marks


    def check_eligibility(self):
if self.marks > 75:
            return f"{self.name} is eligible for the merit-based scholarship."
        else:
            return f"{self.name} is not eligible for the merit-based scholarship."
# Taking user input for student name and
marks name = input("Enter student's name: ")
marks = float(input("Enter student's marks: "))
# Creating a ScholarshipEligibility object
student = ScholarshipEligibility(name, marks)
# Checking eligibility and printing the result
eligibility_result = student.check_eligibility()
print(eligibility_result)
```

Output :



Code Analysis :

- Defines a class to store student name and marks.
- Takes user input for student details.
- Uses an if-else condition to check marks greater than 75.
- Determines eligibility for a merit-based scholarship.
- Displays the eligibility result clearly.

Task 5

Prompt: #Create a Python class Shopping Cart that stores items. Add methods to add items, remove items, calculate total using a loop, and apply discount if total exceeds a limit user input.

class ShoppingCart: def __init__(self): self.items = [] def add_item(self, item_name, price):

self.items.append({"na

me": item_name, "price":

price})

print(f"Added

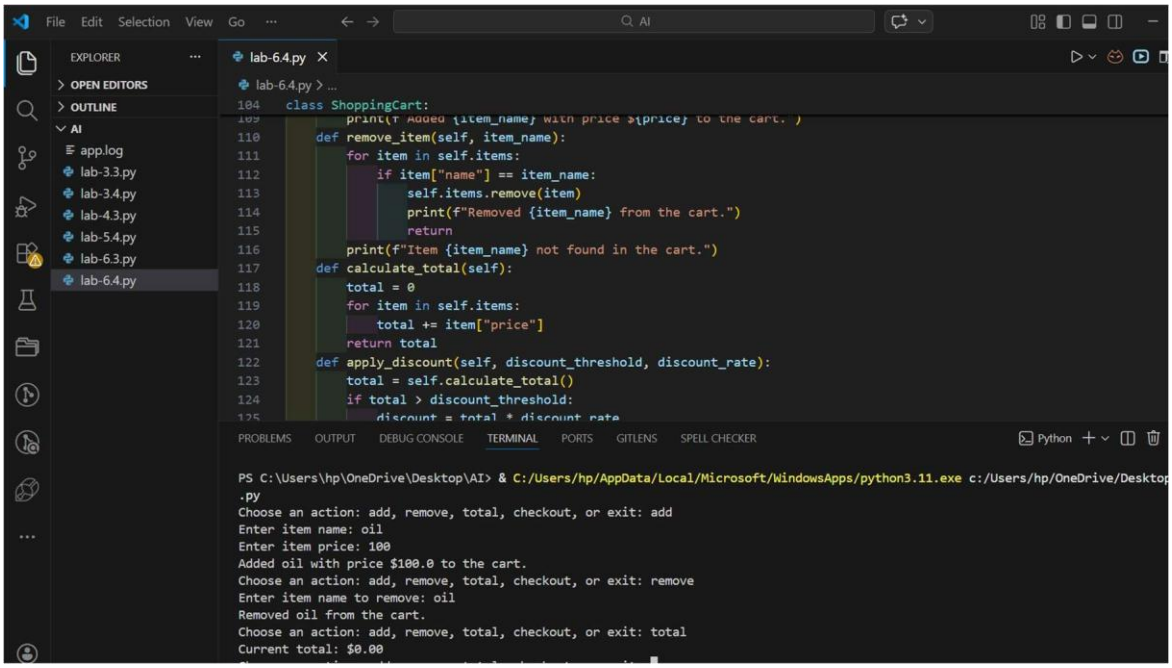
```
{item_name} with price
${price} to the cart.")
def remove_item(self,
item_name):
        for item in self.items:
            if item["name"] ==
item_name:

self.items.remove (item)
print(f"Removed
{item_name} from the
cart.")                return
print(f"Item
{item_name} not found
in
the cart.")     def
calculate_total(self):
total = 0         for item in
self.items:             total +=
item["price"]
        return total     def
apply_discount(self,
discount_threshold,
discount_rate):
        total =
self.calculate_total()         if
total >
discount_threshold:
```

```
            discount = total *
discount_rate
            total   -=   discount
print(f"Discount              of
${discount:.2f} applied.")
        return total
cart = ShoppingCart()
while True:     action =
input("Choose an action:
add, remove, total,
checkout, or exit:
").lower()     if action ==
"add":         item_name =
input("Enter item name:
")
        price =
float(input("Enter item
price: "))
cart.add_item(item_na me,
price)     elif action ==
"remove":         item_name
= input("Enter item name
to remove: ")
cart.remove_item(item
_name)
    elif action == "total":         total = cart.calculate_total()         print(f"Current total:
${total:.2f}")     elif action == "checkout":
        discount_threshold =
float(input("Enter discount
```

```
threshold: "))
discount_rate =
float(input("Enter discount
rate (as a decimal): "))
final_total =
cart.apply_discount(discou
nt_threshold,
discount_rate)
print(f"Final total after
discount (if applicable):
${final_total:.2f}")     elif
action == "exit":
print("Exiting the
program.")
        break     else:
print("Invalid action.
Please choose again.")
```

Output :



Code Analysis :

- Implements a ShoppingCart class to store items in a list.
- Provides methods to add and remove items from the cart.
- Uses a loop to calculate the total price of items.
- Applies a discount when total exceeds a user-defined threshold.
- Uses a while loop for continuous user interaction.