Lab Assignment-5.1

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Batch: 02

Task 1:

Employee Data:

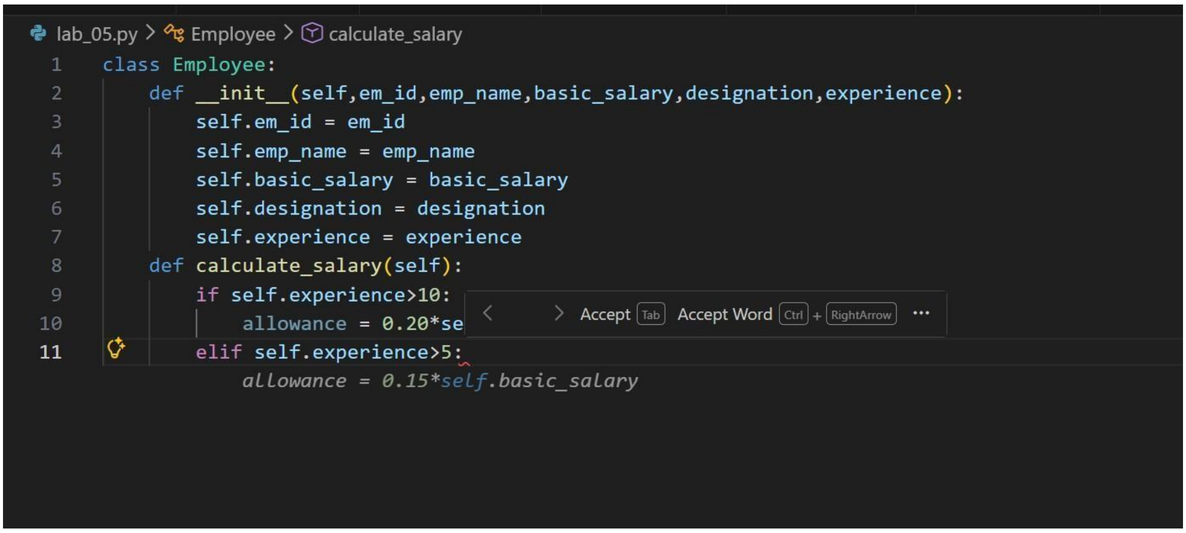
Create Python code that defines a class named `Employee` with the following attributes: `empid`, `empname`, `designation`, `basic_salary`, and `exp`. Implement a method `display_details()` to print all employee details. Implement another method `calculate_allowance()` to determine additional allowance based on experience:

- If `exp > 10 years` → allowance = 20% of `basic_salary`

- If `5 ≤ exp ≤ 10 years` → allowance = 10% of `basic_salary`

- If `exp < 5 years` → allowance = 5% of `basic_salary`

Finally, create at least one instance of the `Employee` class, call the `display_details()` method, and print the calculated allowance.


lab_05.py > Employee > calculate_salary
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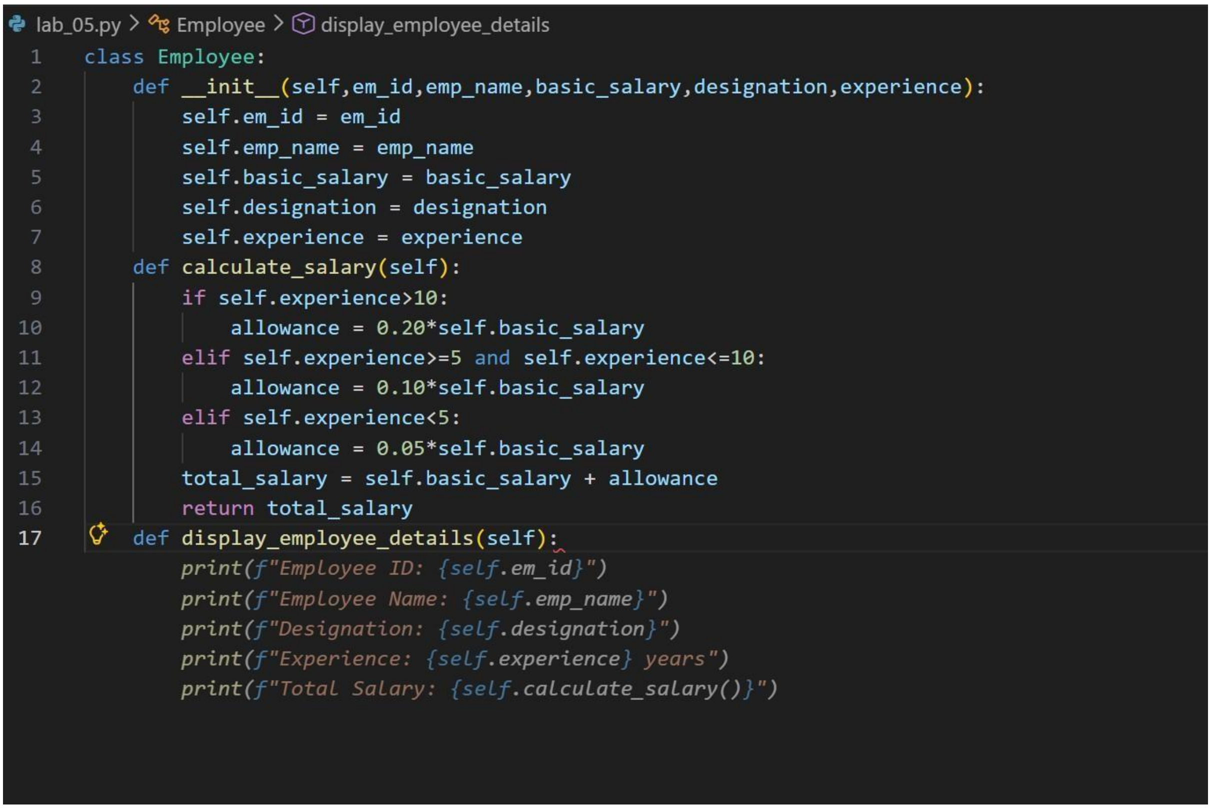
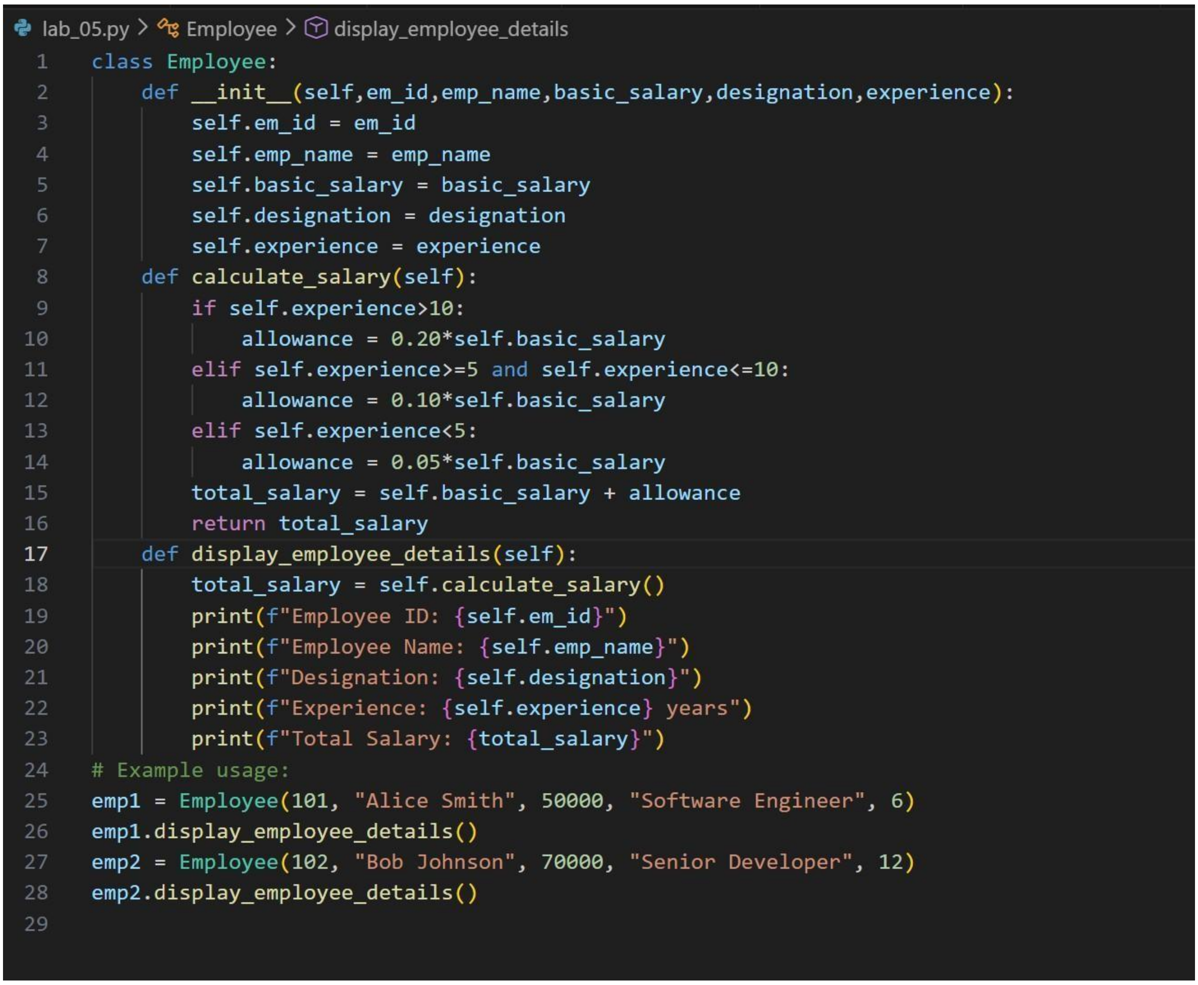
Accept Word Ctrl + RightArrow
...

```
class Employee:
    def __init__(self,em_id,emp_name,basic_salary,designation,experience):
        self.em_id = em_id
        self.emp_name = emp_name
        self.basic_salary = basic_salary
        self.designation = designation
        self.experience = experience
    def calculate_salary(self):
        if self.experience>10:
            allowance = 0.20*se
        elif self.experience>5:
            allowance = 0.15*self.basic_salary
```

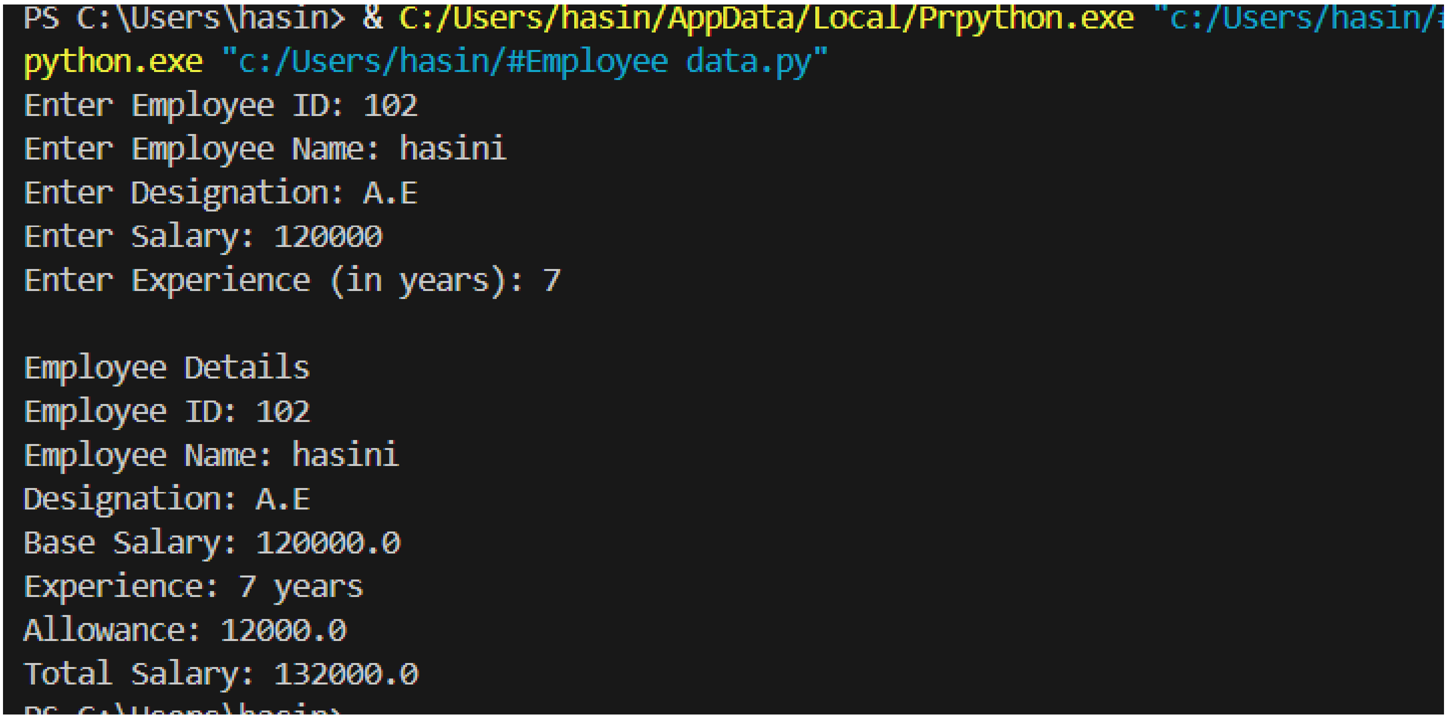


```python
class Employee:
    def __init__(self,em_id,emp_name,basic_salary,designation,experience):
        self.em_id = em_id
        self.emp_name = emp_name
        self.basic_salary = basic_salary
        self.designation = designation
        self.experience = experience
    def calculate_salary(self):
        if self.experience>10:
            allowance = 0.20*self.basic_salary
        elif self.experience>=5 and self.experience<=10:
            allowance = 0.10*self.basic_salary
        elif self.experience<5:
            allowance = 0.05*self.basic_salary
        total_salary = self.basic_salary + allowance
        return total_salary
    def display_employee_details(self):
        print(f"Employee ID: {self.em_id}")
        print(f"Employee Name: {self.emp_name}")
        print(f"Designation: {self.designation}")
        print(f"Experience: {self.experience} years")
        print(f"Total Salary: {self.calculate_salary()}")
```



```python
class Employee:
    def __init__(self,em_id,emp_name,basic_salary,designation,experience):
        self.em_id = em_id
        self.emp_name = emp_name
        self.basic_salary = basic_salary
        self.designation = designation
        self.experience = experience
    def calculate_salary(self):
        if self.experience>10:
            allowance = 0.20*self.basic_salary
        elif self.experience>=5 and self.experience<=10:
            allowance = 0.10*self.basic_salary
        elif self.experience<5:
            allowance = 0.05*self.basic_salary
        total_salary = self.basic_salary + allowance
        return total_salary
    def display_employee_details(self):
        total_salary = self.calculate_salary()
        print(f"Employee ID: {self.em_id}")
        print(f"Employee Name: {self.emp_name}")
        print(f"Designation: {self.designation}")
        print(f"Experience: {self.experience} years")
        print(f"Total Salary: {total_salary}")
# Example usage:
emp1 = Employee(101, "Alice Smith", 50000, "Software Engineer", 6)
emp1.display_employee_details()
emp2 = Employee(102, "Bob Johnson", 70000, "Senior Developer", 12)
emp2.display_employee_details()
```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Prpython.exe "c:/Users/hasin/#
python.exe "c:/Users/hasin/#Employee data.py"
Enter Employee ID: 102
Enter Employee Name: hasini
Enter Designation: A.E
Enter Salary: 120000
Enter Experience (in years): 7

Employee Details
Employee ID: 102
Employee Name: hasini
Designation: A.E
Base Salary: 120000.0
Experience: 7 years
Allowance: 12000.0
Total Salary: 132000.0
PS C:\Users\hasin>
```

TASK 2:

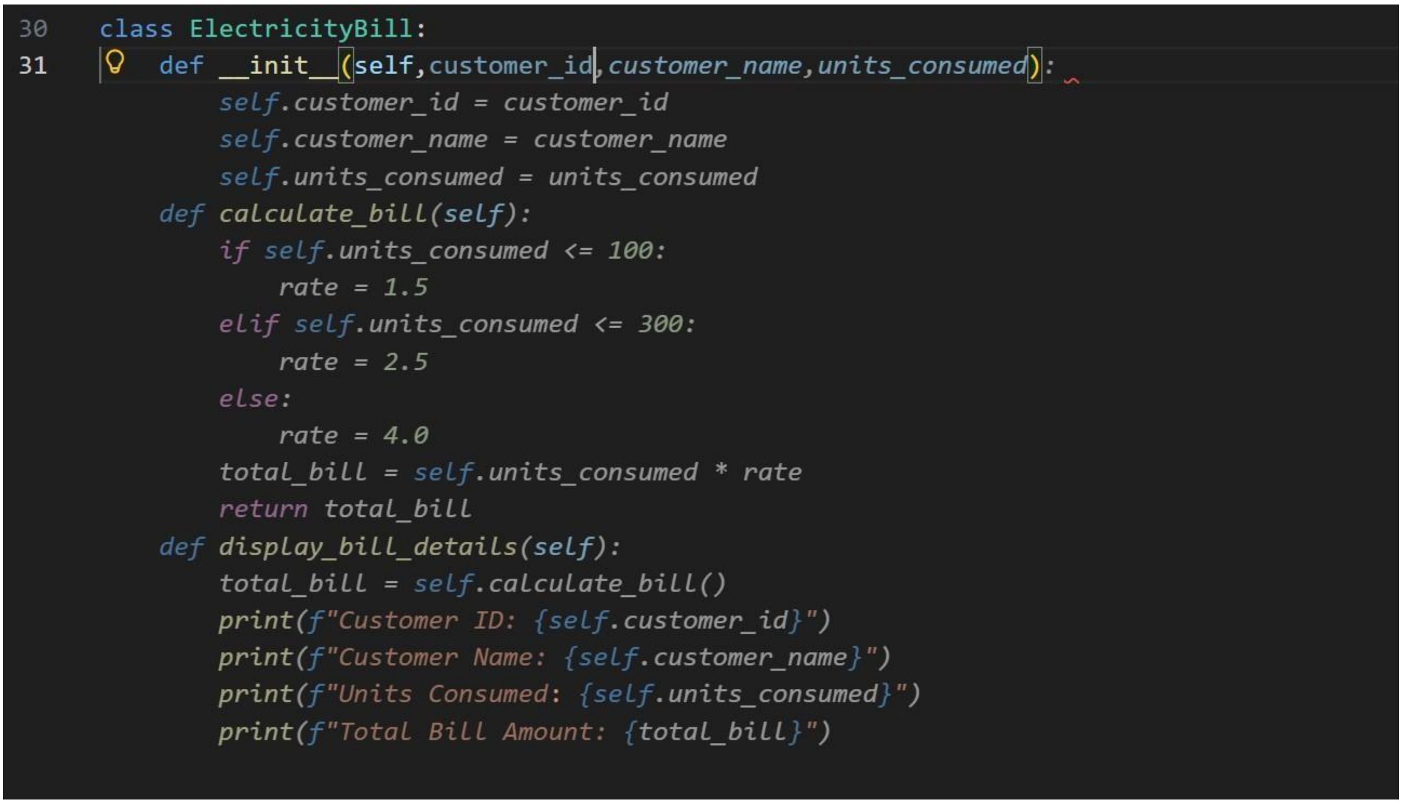
Electricity Bill Calculation- Create Python code that defines a class named `ElectricityBill` with attributes: `customer_id`, `name`, and `units_consumed`. Implement a method `display_details()` to print customer details, and a method `calculate_bill()` where:

- Units ≤ 100 → ₹5 per unit

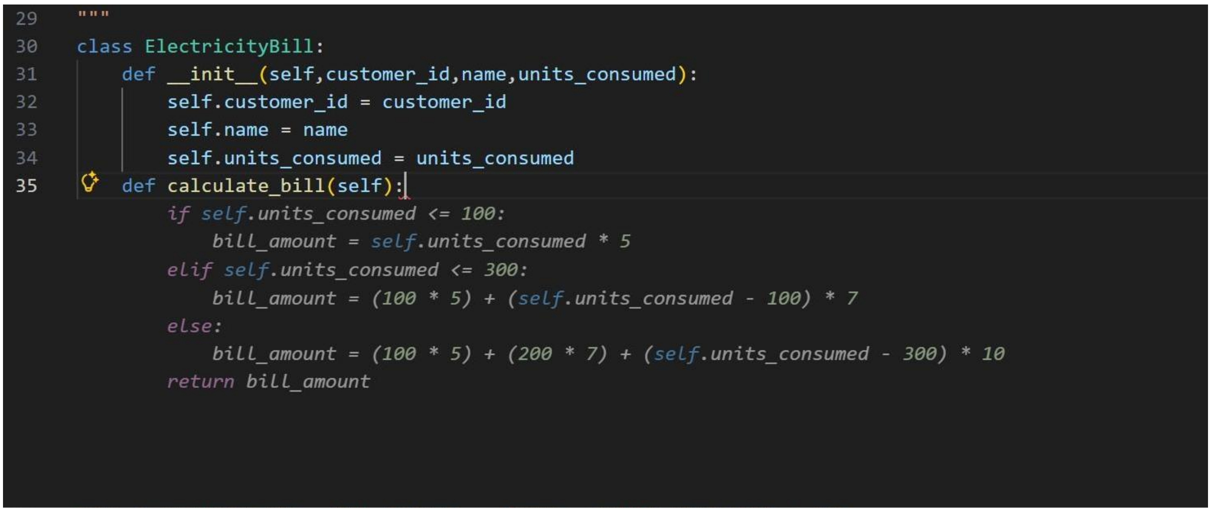
- 101 to 300 units → ₹7 per unit

- More than 300 units → ₹10 per unit

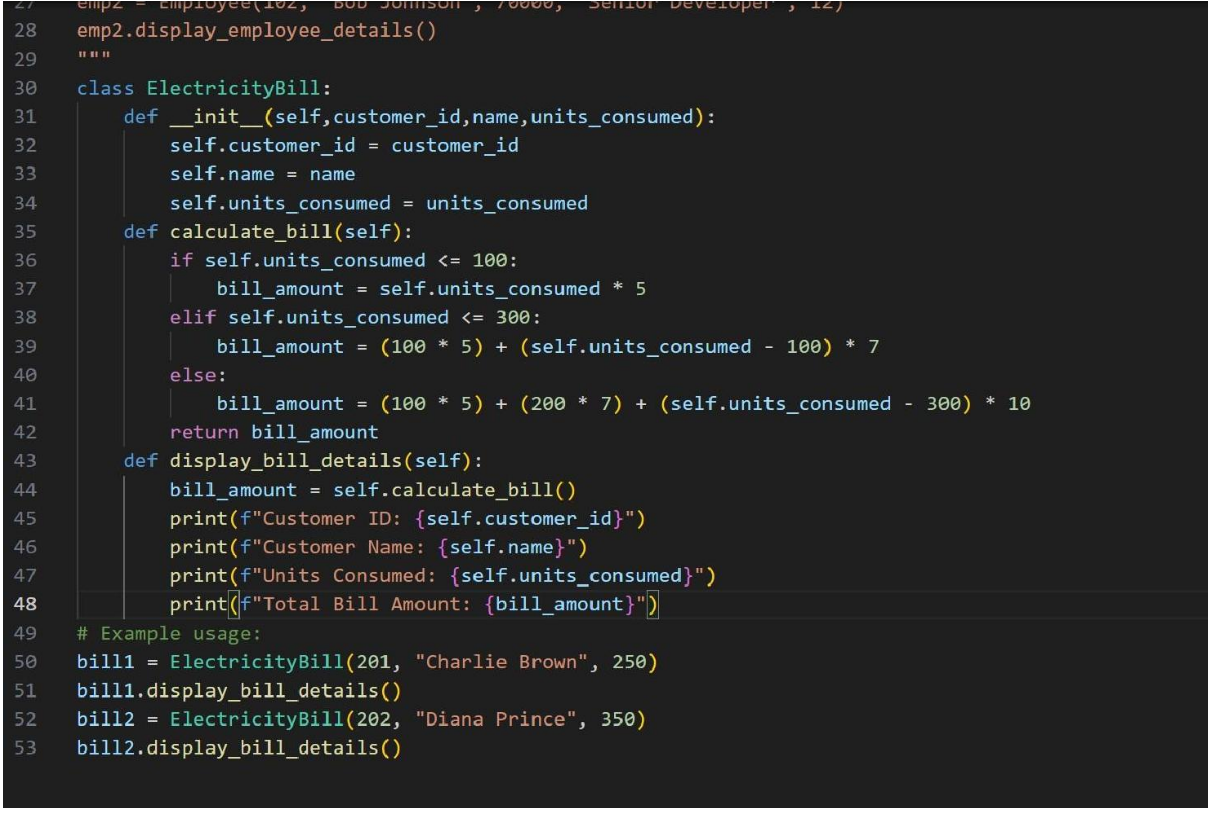
Create a bill object, display details, and print the total bill amount.



```
class ElectricityBill:
    def __init__(self,customer_id,customer_name,units_consumed):
        self.customer_id = customer_id
        self.customer_name = customer_name
        self.units_consumed = units_consumed
    def calculate_bill(self):
        if self.units_consumed <= 100:
            rate = 1.5
        elif self.units_consumed <= 300:
            rate = 2.5
        else:
            rate = 4.0
        total_bill = self.units_consumed * rate
        return total_bill
    def display_bill_details(self):
        total_bill = self.calculate_bill()
        print(f"Customer ID: {self.customer_id}")
        print(f"Customer Name: {self.customer_name}")
        print(f"Units Consumed: {self.units_consumed}")
        print(f"Total Bill Amount: {total_bill}")
```

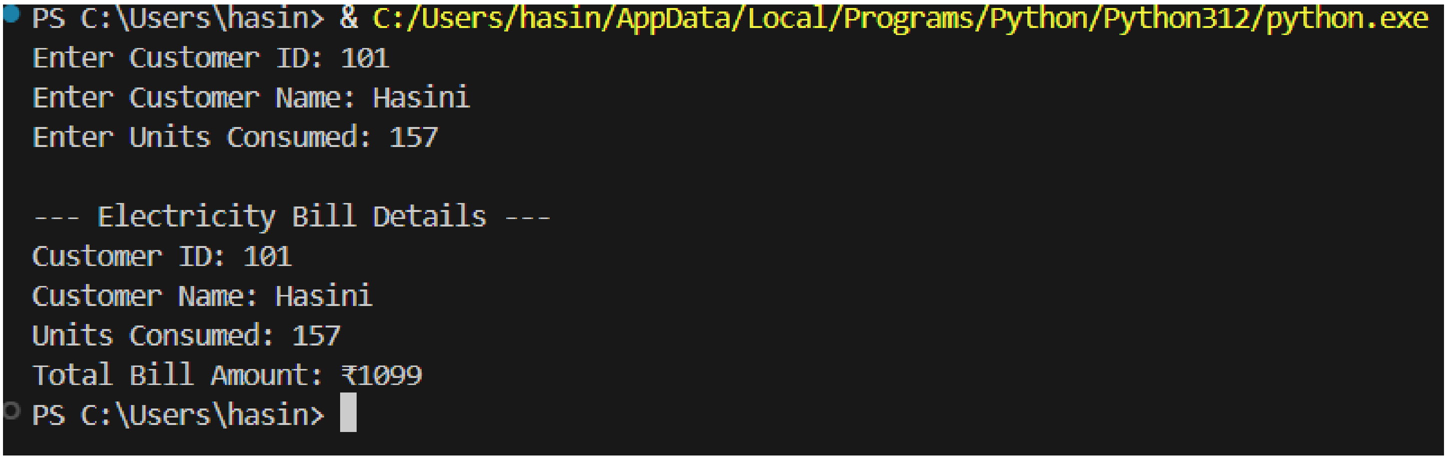


```python
"""
class ElectricityBill:
    def __init__(self,customer_id,name,units_consumed):
        self.customer_id = customer_id
        self.name = name
        self.units_consumed = units_consumed
    def calculate_bill(self):
        if self.units_consumed <= 100:
            bill_amount = self.units_consumed * 5
        elif self.units_consumed <= 300:
            bill_amount = (100 * 5) + (self.units_consumed - 100) * 7
        else:
            bill_amount = (100 * 5) + (200 * 7) + (self.units_consumed - 300) * 10
        return bill_amount
```



```python
emp2 = Employee(102, "Bob Johnson", 70000, "Senior Developer", 12)
emp2.display_employee_details()
"""
class ElectricityBill:
    def __init__(self,customer_id,name,units_consumed):
        self.customer_id = customer_id
        self.name = name
        self.units_consumed = units_consumed
    def calculate_bill(self):
        if self.units_consumed <= 100:
            bill_amount = self.units_consumed * 5
        elif self.units_consumed <= 300:
            bill_amount = (100 * 5) + (self.units_consumed - 100) * 7
        else:
            bill_amount = (100 * 5) + (200 * 7) + (self.units_consumed - 300) * 10
        return bill_amount
    def display_bill_details(self):
        bill_amount = self.calculate_bill()
        print(f"Customer ID: {self.customer_id}")
        print(f"Customer Name: {self.name}")
        print(f"Units Consumed: {self.units_consumed}")
        print(f"Total Bill Amount: {bill_amount}")
# Example usage:
bill1 = ElectricityBill(201, "Charlie Brown", 250)
bill1.display_bill_details()
bill2 = ElectricityBill(202, "Diana Prince", 350)
bill2.display_bill_details()
```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python/Python312/python.exe
Enter Customer ID: 101
Enter Customer Name: Hasini
Enter Units Consumed: 157

--- Electricity Bill Details ---
Customer ID: 101
Customer Name: Hasini
Units Consumed: 157
Total Bill Amount: ₹1099
PS C:\Users\hasin>
```

TASK 3:

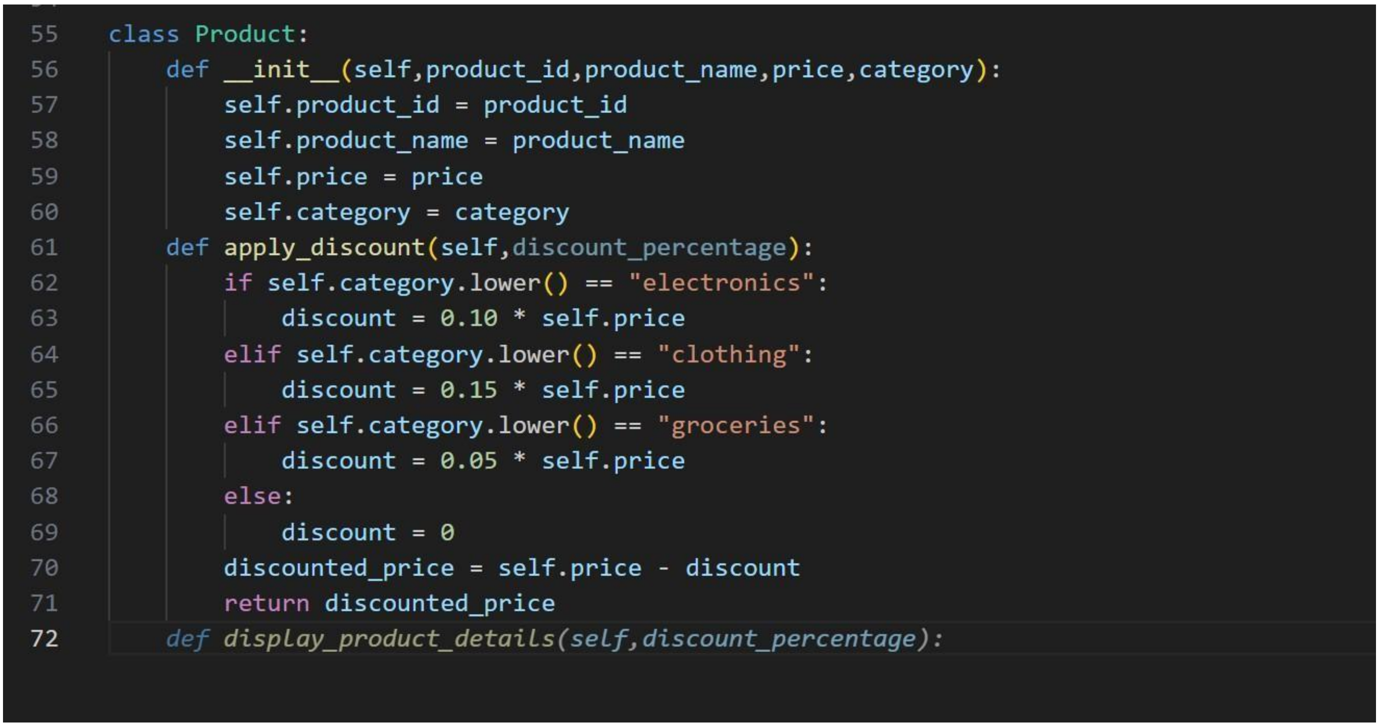
Product Discount Calculation- Create Python code that defines a class named `Product` with attributes: `product_id`, `product_name`, `price`, and `category`. Implement a method `display_details()` to print product details. Implement another method `calculate_discount()` where:

- Electronics → 10% discount

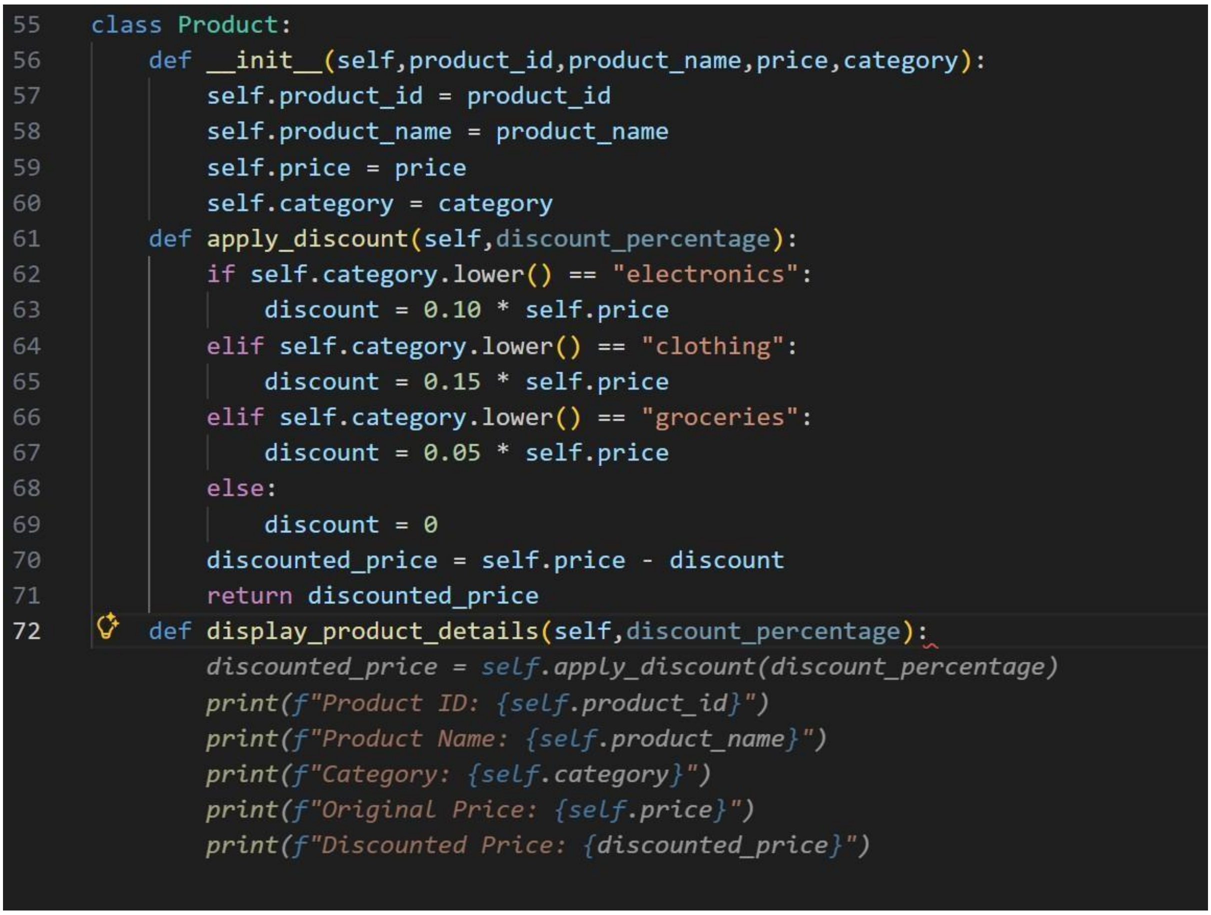
- Clothing → 15% discount

- Grocery → 5% discount

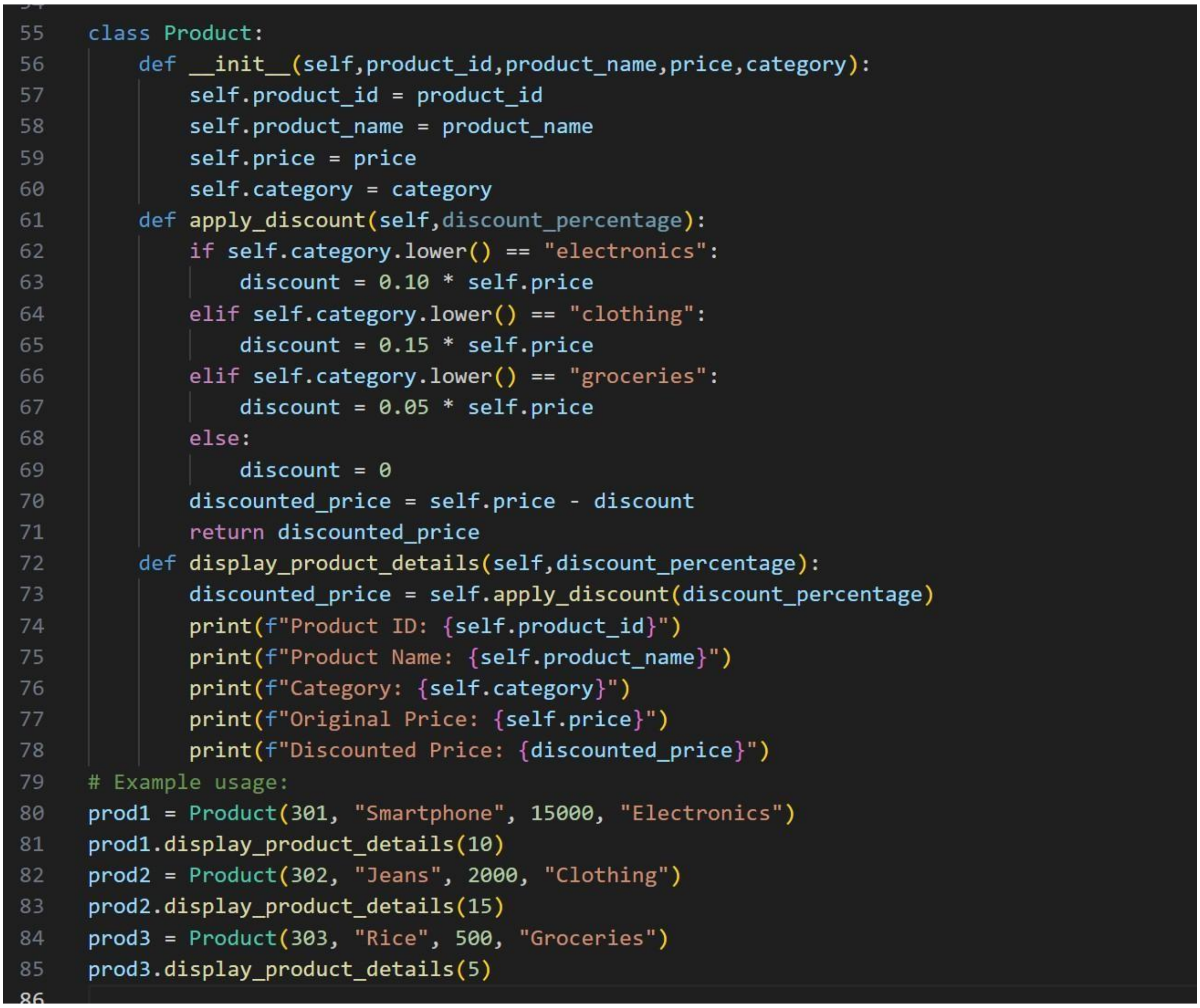
Create at least one product object, display details, and print the final price after discount.



```python
class Product:
    def __init__(self,product_id,product_name,price,category):
        self.product_id = product_id
        self.product_name = product_name
        self.price = price
        self.category = category
    def apply_discount(self,discount_percentage):
        if self.category.lower() == "electronics":
            discount = 0.10 * self.price
        elif self.category.lower() == "clothing":
            discount = 0.15 * self.price
        elif self.category.lower() == "groceries":
            discount = 0.05 * self.price
        else:
            discount = 0
        discounted_price = self.price - discount
        return discounted_price
    def display_product_details(self,discount_percentage):
```

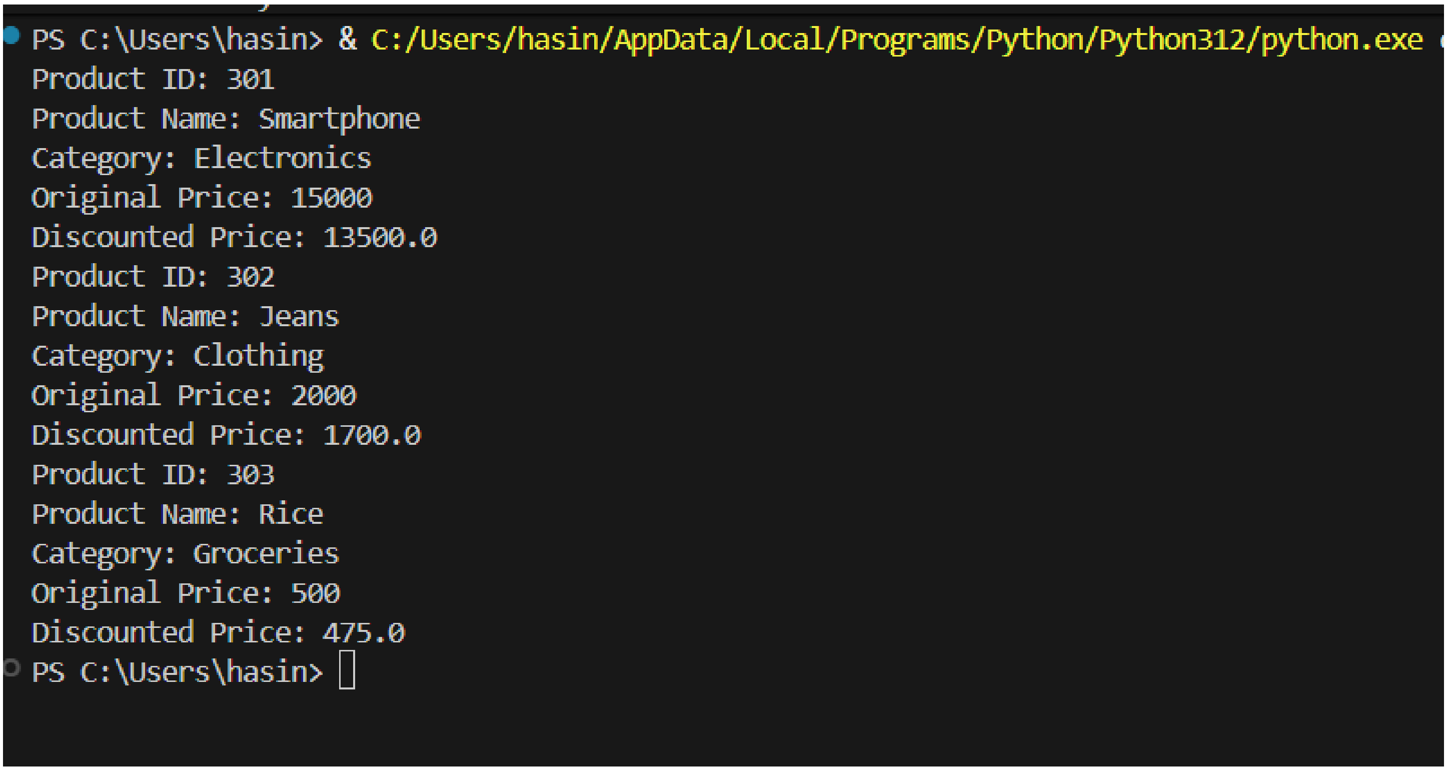


```python
class Product:
    def __init__(self,product_id,product_name,price,category):
        self.product_id = product_id
        self.product_name = product_name
        self.price = price
        self.category = category
    def apply_discount(self,discount_percentage):
        if self.category.lower() == "electronics":
            discount = 0.10 * self.price
        elif self.category.lower() == "clothing":
            discount = 0.15 * self.price
        elif self.category.lower() == "groceries":
            discount = 0.05 * self.price
        else:
            discount = 0
        discounted_price = self.price - discount
        return discounted_price
    def display_product_details(self,discount_percentage):
        discounted_price = self.apply_discount(discount_percentage)
        print(f"Product ID: {self.product_id}")
        print(f"Product Name: {self.product_name}")
        print(f"Category: {self.category}")
        print(f"Original Price: {self.price}")
        print(f"Discounted Price: {discounted_price}")
```



```python
class Product:
    def __init__(self,product_id,product_name,price,category):
        self.product_id = product_id
        self.product_name = product_name
        self.price = price
        self.category = category
    def apply_discount(self,discount_percentage):
        if self.category.lower() == "electronics":
            discount = 0.10 * self.price
        elif self.category.lower() == "clothing":
            discount = 0.15 * self.price
        elif self.category.lower() == "groceries":
            discount = 0.05 * self.price
        else:
            discount = 0
        discounted_price = self.price - discount
        return discounted_price
    def display_product_details(self,discount_percentage):
        discounted_price = self.apply_discount(discount_percentage)
        print(f"Product ID: {self.product_id}")
        print(f"Product Name: {self.product_name}")
        print(f"Category: {self.category}")
        print(f"Original Price: {self.price}")
        print(f"Discounted Price: {discounted_price}")
# Example usage:
prod1 = Product(301, "Smartphone", 15000, "Electronics")
prod1.display_product_details(10)
prod2 = Product(302, "Jeans", 2000, "Clothing")
prod2.display_product_details(15)
prod3 = Product(303, "Rice", 500, "Groceries")
prod3.display_product_details(5)
```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python/Python312/python.exe
Product ID: 301
Product Name: Smartphone
Category: Electronics
Original Price: 15000
Discounted Price: 13500.0
Product ID: 302
Product Name: Jeans
Category: Clothing
Original Price: 2000
Discounted Price: 1700.0
Product ID: 303
Product Name: Rice
Category: Groceries
Original Price: 500
Discounted Price: 475.0
PS C:\Users\hasin> 
```

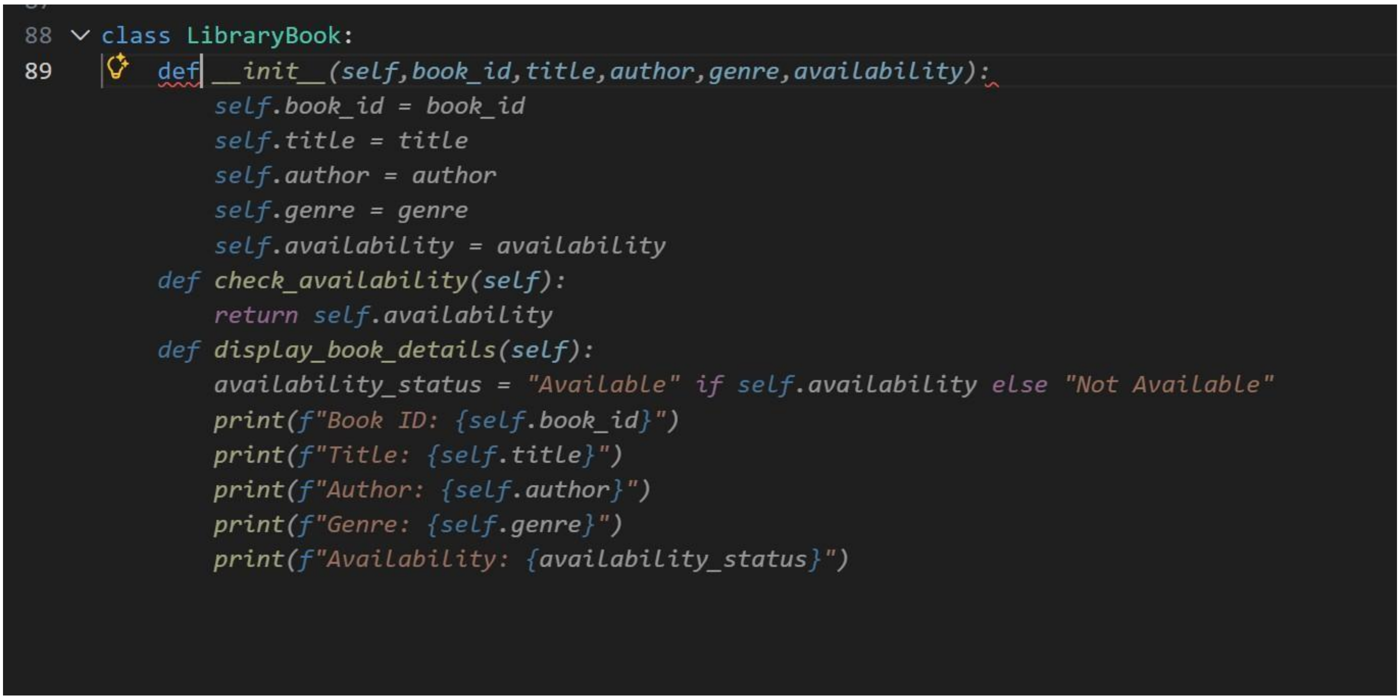
TASK 4:

Book Late Fee Calculation- Create Python code that defines a class named `LibraryBook` with attributes: `book_id`, `title`, `author`, `borrower`, and `days_late`. Implement a method `display_details()` to print book details, and a method `calculate_late_fee()` where:

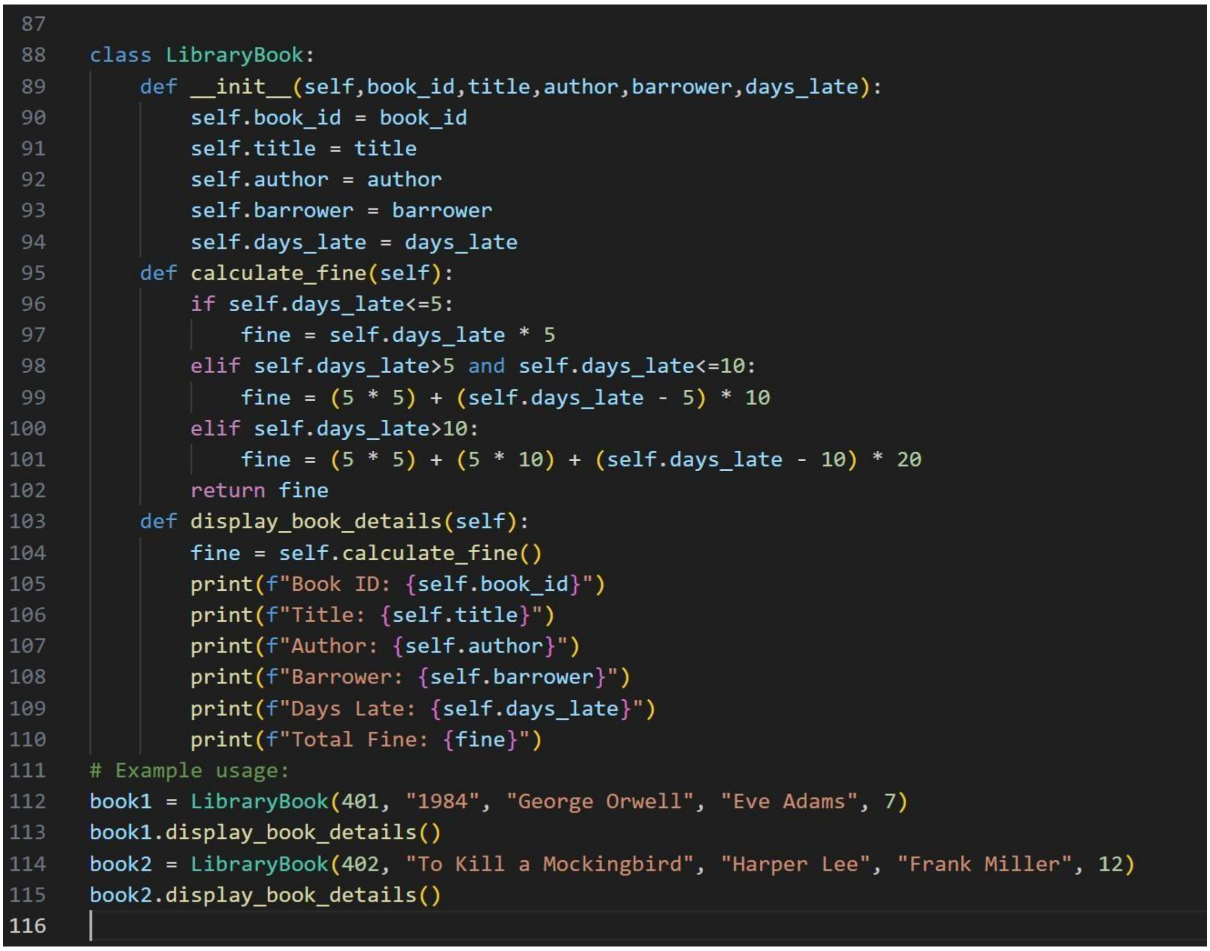
- Days late ≤ 5 → ₹5 per day

- 6 to 10 days late → ₹7 per day

- More than 10 days late → ₹10 per day
- Create a book object, display details, and print the late fee.



```python
class LibraryBook:
    def __init__(self,book_id,title,author,genre,availability):
        self.book_id = book_id
        self.title = title
        self.author = author
        self.genre = genre
        self.availability = availability
    def check_availability(self):
        return self.availability
    def display_book_details(self):
        availability_status = "Available" if self.availability else "Not Available"
        print(f"Book ID: {self.book_id}")
        print(f"Title: {self.title}")
        print(f"Author: {self.author}")
        print(f"Genre: {self.genre}")
        print(f"Availability: {availability_status}")
```

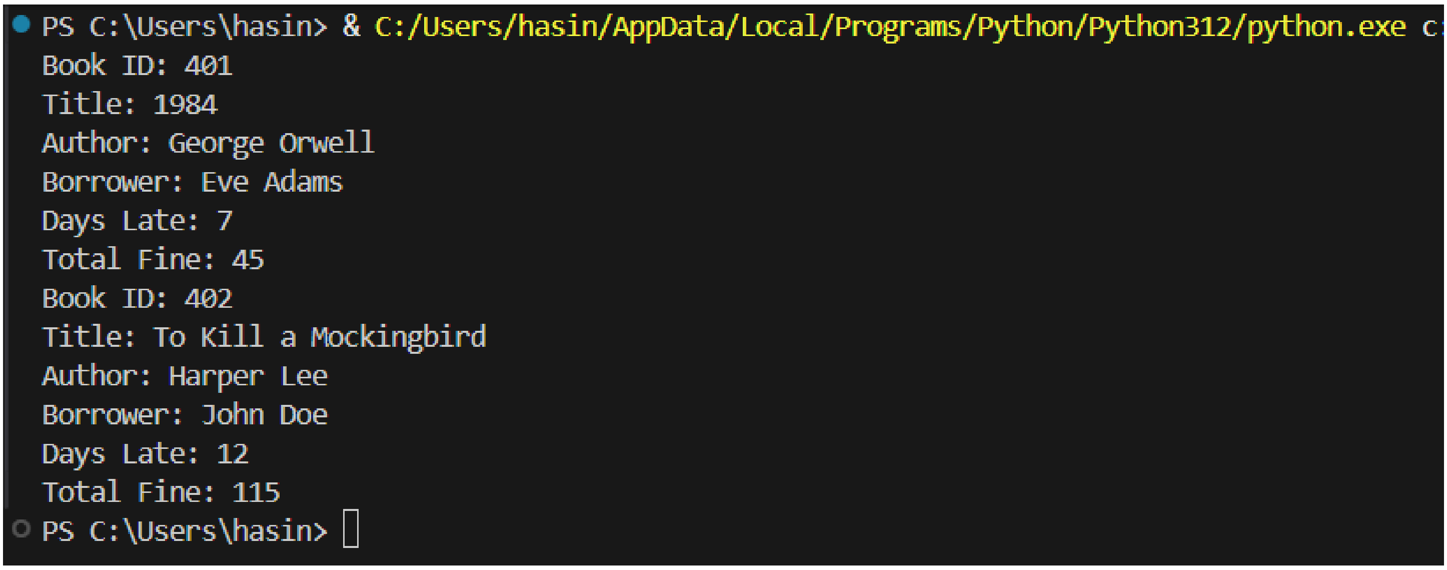


```python

class LibraryBook:
    def __init__(self,book_id,title,author,barrower,days_late):
        self.book_id = book_id
        self.title = title
        self.author = author
        self.barrower = barrower
        self.days_late = days_late
    def calculate_fine(self):
        if self.days_late<=5:
            fine = self.days_late * 5
        elif self.days_late>5 and self.days_late<=10:
            fine = (5 * 5) + (self.days_late - 5) * 10
        elif self.days_late>10:
            fine = (5 * 5) + (5 * 10) + (self.days_late - 10) * 20
        return fine
    def display_book_details(self):
        fine = self.calculate_fine()
        print(f"Book ID: {self.book_id}")
        print(f"Title: {self.title}")
        print(f"Author: {self.author}")
        print(f"Barrower: {self.barrower}")
        print(f"Days Late: {self.days_late}")
        print(f"Total Fine: {fine}")
# Example usage:
book1 = LibraryBook(401, "1984", "George Orwell", "Eve Adams", 7)
book1.display_book_details()
book2 = LibraryBook(402, "To Kill a Mockingbird", "Harper Lee", "Frank Miller", 12)
book2.display_book_details()

```

Output:



```
● PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python/Python312/python.exe c:
  Book ID: 401
  Title: 1984
  Author: George Orwell
  Borrower: Eve Adams
  Days Late: 7
  Total Fine: 45
  Book ID: 402
  Title: To Kill a Mockingbird
  Author: Harper Lee
  Borrower: John Doe
  Days Late: 12
  Total Fine: 115
○ PS C:\Users\hasin> 
```

TASK 5:

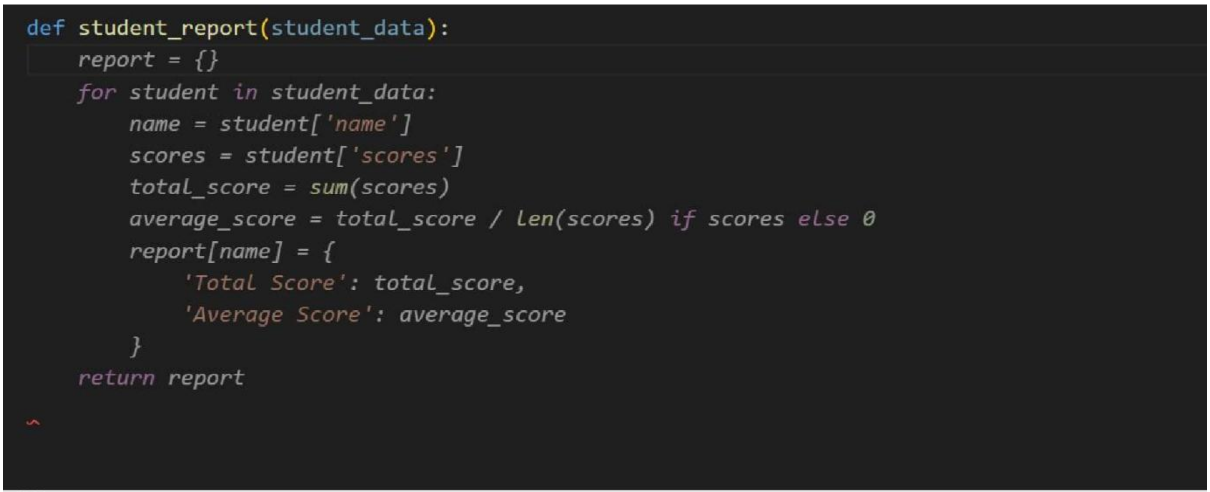
`student_report(student_data)` that accepts a dictionary containing student names and their marks. The function should:

- Calculate the average score for each student

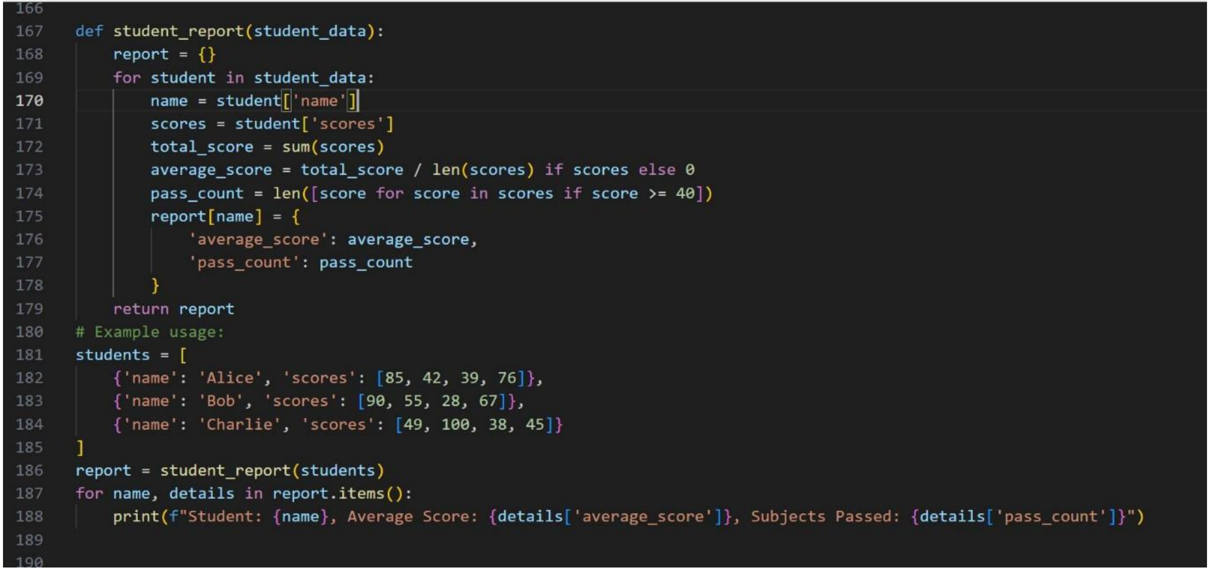
- Determine pass/fail status (pass ≥ 40)

- Return a summary report as a list of dictionaries

Use Copilot suggestions as you build the function and format the output.



```python
def student_report(student_data):
    report = {}
    for student in student_data:
        name = student['name']
        scores = student['scores']
        total_score = sum(scores)
        average_score = total_score / len(scores) if scores else 0
        report[name] = {
            'Total Score': total_score,
            'Average Score': average_score
        }
    return report
```

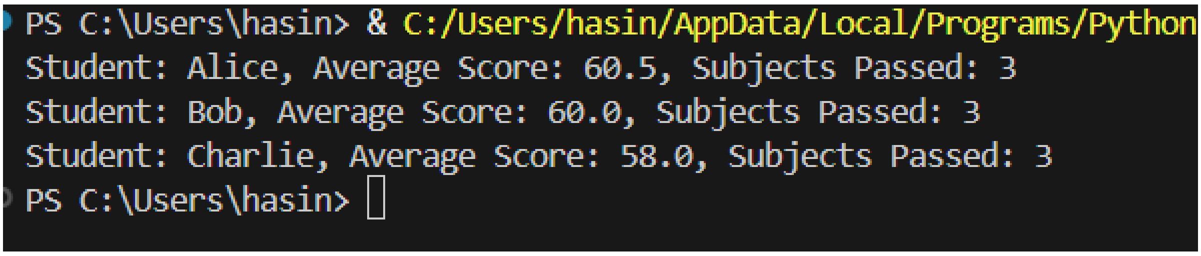


```python

def student_report(student_data):
    report = {}
    for student in student_data:
        name = student['name']
        scores = student['scores']
        total_score = sum(scores)
        average_score = total_score / len(scores) if scores else 0
        pass_count = len([score for score in scores if score >= 40])
        report[name] = {
            'average_score': average_score,
            'pass_count': pass_count
        }
    return report
# Example usage:
students = [
    {'name': 'Alice', 'scores': [85, 42, 39, 76]},
    {'name': 'Bob', 'scores': [90, 55, 28, 67]},
    {'name': 'Charlie', 'scores': [49, 100, 38, 45]}
]
report = student_report(students)
for name, details in report.items():
    print(f"Student: {name}, Average Score: {details['average_score']}, Subjects Passed: {details['pass_count']}")

```

OUTPUT:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python
Student: Alice, Average Score: 60.5, Subjects Passed: 3
Student: Bob, Average Score: 60.0, Subjects Passed: 3
Student: Charlie, Average Score: 58.0, Subjects Passed: 3
PS C:\Users\hasin> 
```

Task 6:

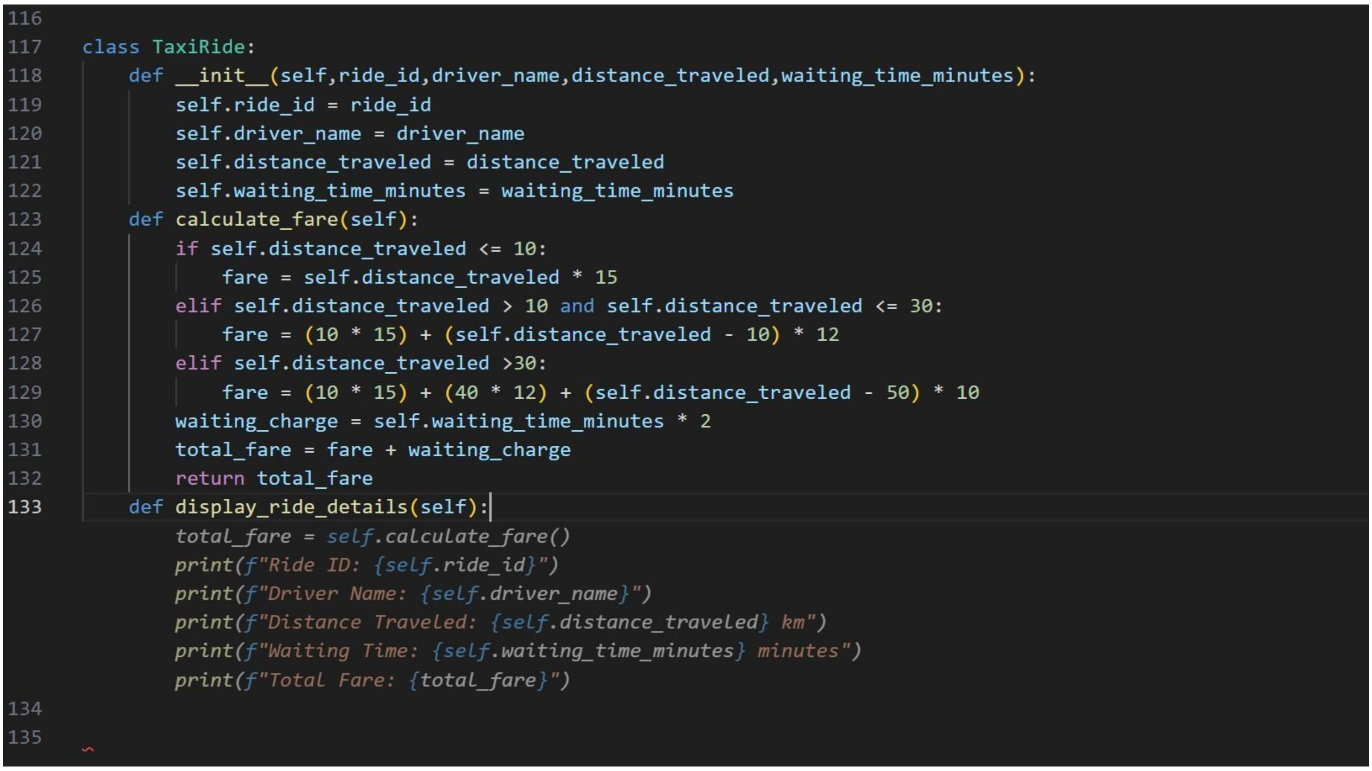
Taxi Fare Calculation-Create Python code that defines a class named `TaxiRide` with attributes: `ride_id`, `driver_name`, `distance_km`, and `waiting_time_min`. Implement a method `display_details()` to print ride details, and a method `calculate_fare()` where:

- ₹15 per km for the first 10 km

- ₹12 per km for the next 20 km - ₹10 per km above 30 km

- Waiting charge: ₹2 per minute

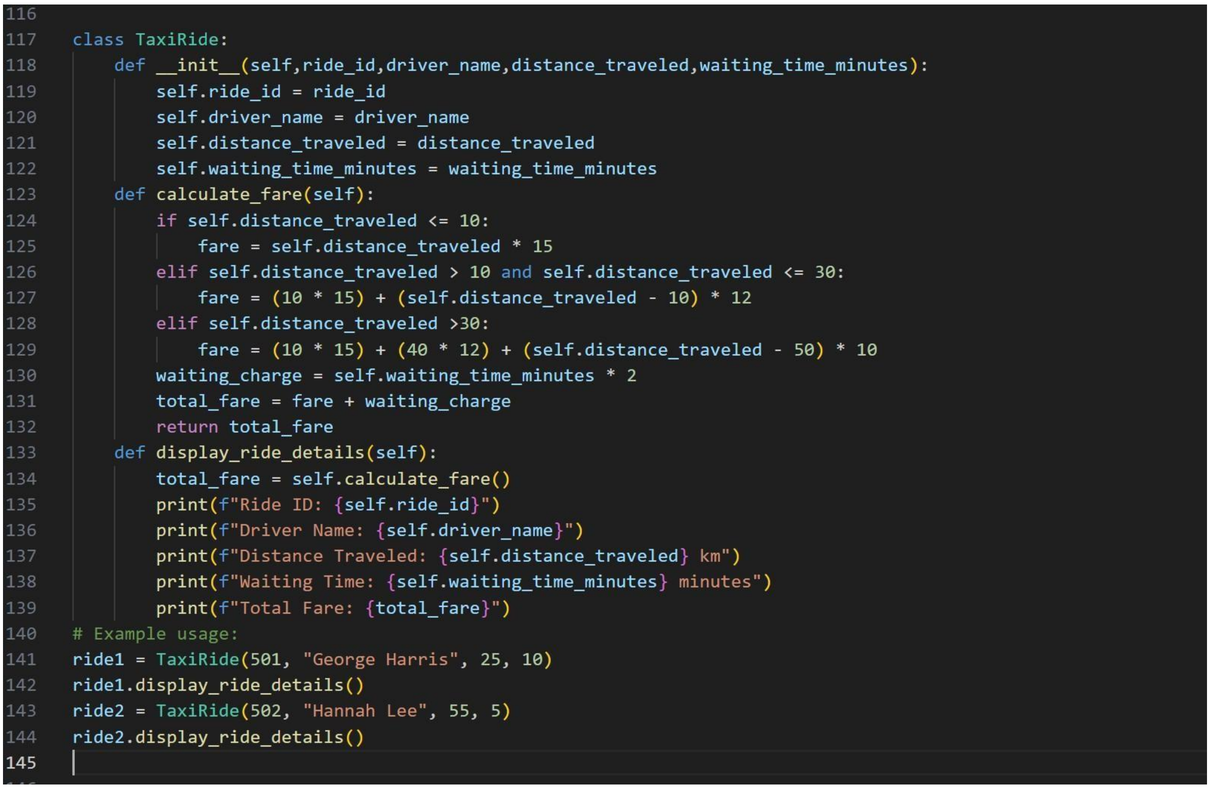
Create a ride object, display details, and print the total fare.



```python

class TaxiRide:
    def __init__(self,ride_id,driver_name,distance_traveled,waiting_time_minutes):
        self.ride_id = ride_id
        self.driver_name = driver_name
        self.distance_traveled = distance_traveled
        self.waiting_time_minutes = waiting_time_minutes
    def calculate_fare(self):
        if self.distance_traveled <= 10:
            fare = self.distance_traveled * 15
        elif self.distance_traveled > 10 and self.distance_traveled <= 30:
            fare = (10 * 15) + (self.distance_traveled - 10) * 12
        elif self.distance_traveled >30:
            fare = (10 * 15) + (40 * 12) + (self.distance_traveled - 50) * 10
        waiting_charge = self.waiting_time_minutes * 2
        total_fare = fare + waiting_charge
        return total_fare
    def display_ride_details(self):
        total_fare = self.calculate_fare()
        print(f"Ride ID: {self.ride_id}")
        print(f"Driver Name: {self.driver_name}")
        print(f"Distance Traveled: {self.distance_traveled} km")
        print(f"Waiting Time: {self.waiting_time_minutes} minutes")
        print(f"Total Fare: {total_fare}")


```

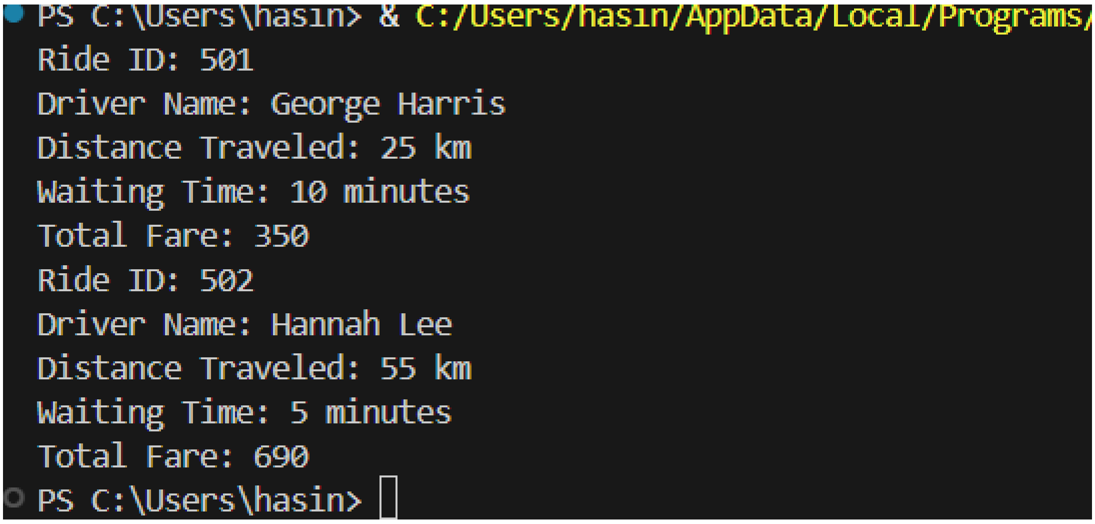


```python

class TaxiRide:
    def __init__(self,ride_id,driver_name,distance_traveled,waiting_time_minutes):
        self.ride_id = ride_id
        self.driver_name = driver_name
        self.distance_traveled = distance_traveled
        self.waiting_time_minutes = waiting_time_minutes
    def calculate_fare(self):
        if self.distance_traveled <= 10:
            fare = self.distance_traveled * 15
        elif self.distance_traveled > 10 and self.distance_traveled <= 30:
            fare = (10 * 15) + (self.distance_traveled - 10) * 12
        elif self.distance_traveled >30:
            fare = (10 * 15) + (40 * 12) + (self.distance_traveled - 50) * 10
        waiting_charge = self.waiting_time_minutes * 2
        total_fare = fare + waiting_charge
        return total_fare
    def display_ride_details(self):
        total_fare = self.calculate_fare()
        print(f"Ride ID: {self.ride_id}")
        print(f"Driver Name: {self.driver_name}")
        print(f"Distance Traveled: {self.distance_traveled} km")
        print(f"Waiting Time: {self.waiting_time_minutes} minutes")
        print(f"Total Fare: {total_fare}")
# Example usage:
ride1 = TaxiRide(501, "George Harris", 25, 10)
ride1.display_ride_details()
ride2 = TaxiRide(502, "Hannah Lee", 55, 5)
ride2.display_ride_details()

```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/
Ride ID: 501
Driver Name: George Harris
Distance Traveled: 25 km
Waiting Time: 10 minutes
Total Fare: 350
Ride ID: 502
Driver Name: Hannah Lee
Distance Traveled: 55 km
Waiting Time: 5 minutes
Total Fare: 690
PS C:\Users\hasin>
```

Task 7:

Statistics Subject Performance - Create a Python function statistics_subject(scores_list)` that accepts a list of 60 student scores and computes key performance statistics. The function should return the following:

- Highest score in the class

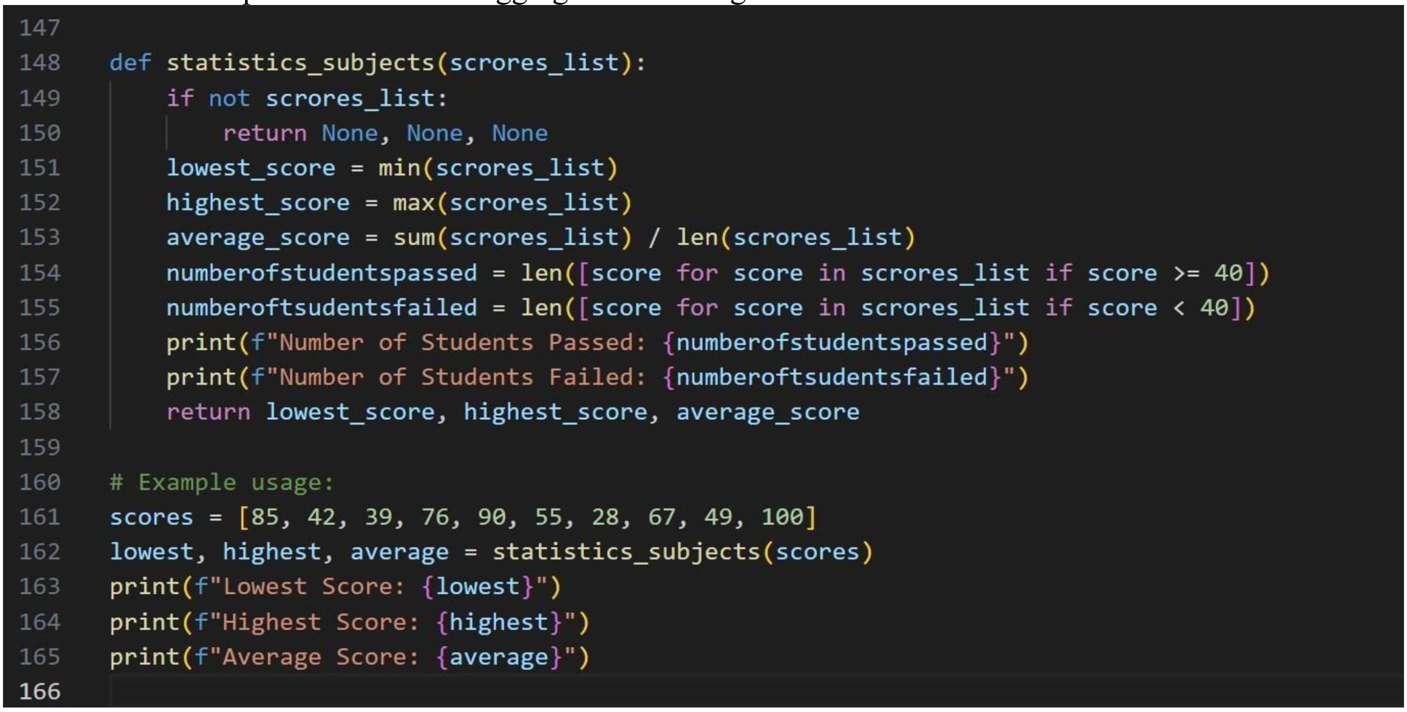
- Lowest score in the class

- Class average score

- Number of students passed (score ≥ 40)

- Number of students failed (score < 40)

Allow Copilot to assist with aggregations and logic



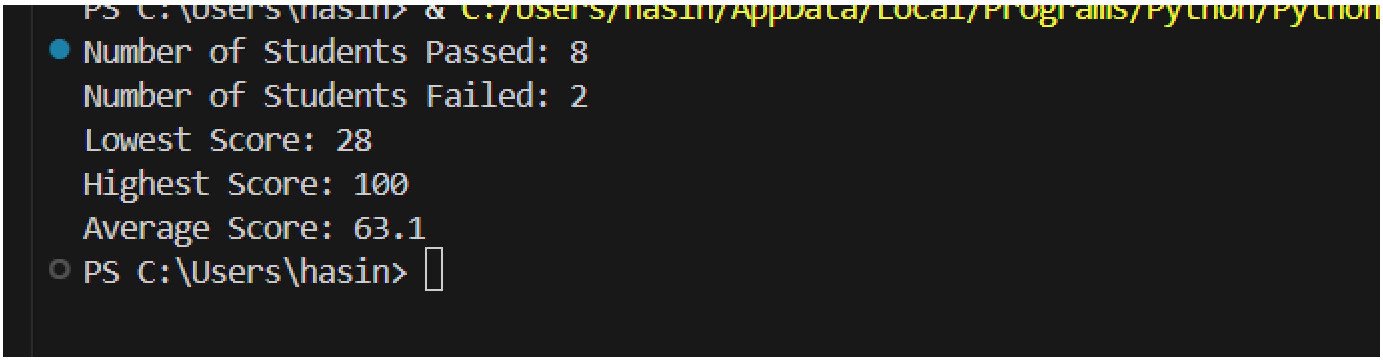
```python

def statistics_subjects(scrores_list):
    if not scrores_list:
        return None, None, None
    lowest_score = min(scrores_list)
    highest_score = max(scrores_list)
    average_score = sum(scrores_list) / len(scrores_list)
    numberofstudentspassed = len([score for score in scrores_list if score >= 40])
    numberoftsudentsfailed = len([score for score in scrores_list if score < 40])
    print(f"Number of Students Passed: {numberofstudentspassed}")
    print(f"Number of Students Failed: {numberoftsudentsfailed}")
    return lowest_score, highest_score, average_score

# Example usage:
scores = [85, 42, 39, 76, 90, 55, 28, 67, 49, 100]
lowest, highest, average = statistics_subjects(scores)
print(f"Lowest Score: {lowest}")
print(f"Highest Score: {highest}")
print(f"Average Score: {average}")

```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python/Python
Number of Students Passed: 8
Number of Students Failed: 2
Lowest Score: 28
Highest Score: 100
Average Score: 63.1
PS C:\Users\hasin>
```

Task 8 (Transparency in Algorithm Optimization)

Task: Use AI to generate two solutions for checking prime numbers:

- Naive approach(basic)
- Optimized approach

Prompt:

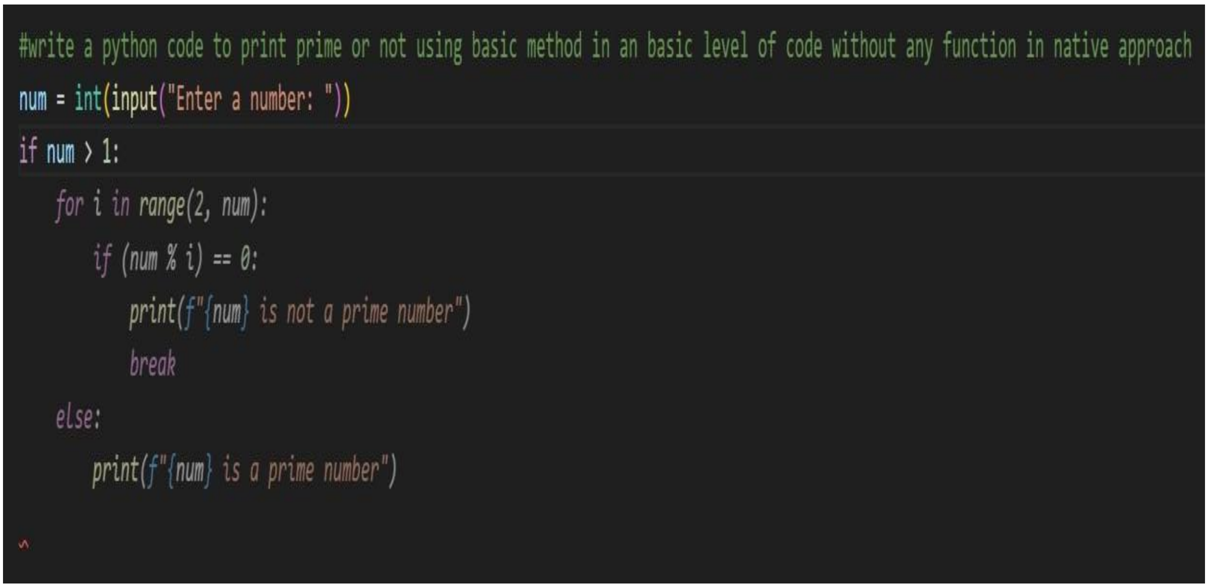
"Generate Python code for two prime-checking methods and explain how the optimized version improves performance."

Expected Output:

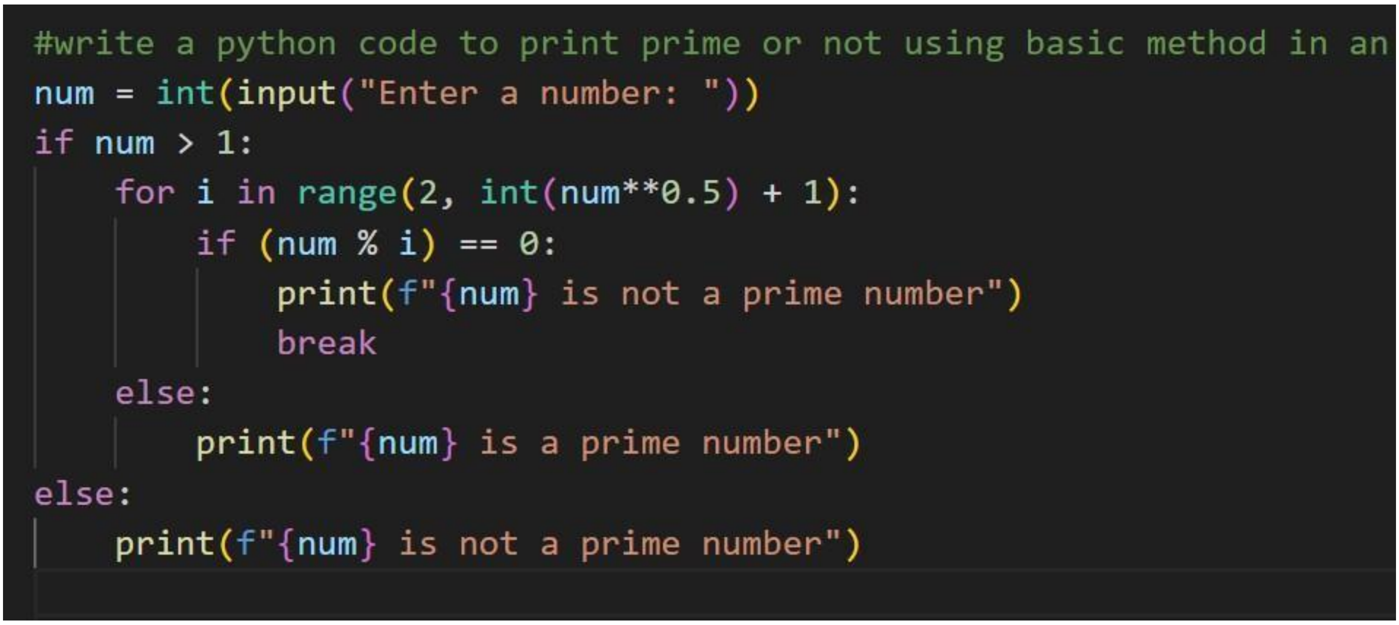
- Code for both methods.
- Transparent explanation of time complexity.
- Comparison highlighting efficiency improvements.

Prompt:

#write a python code to print prime or not using basic method in an basic level of code without any function in native approach

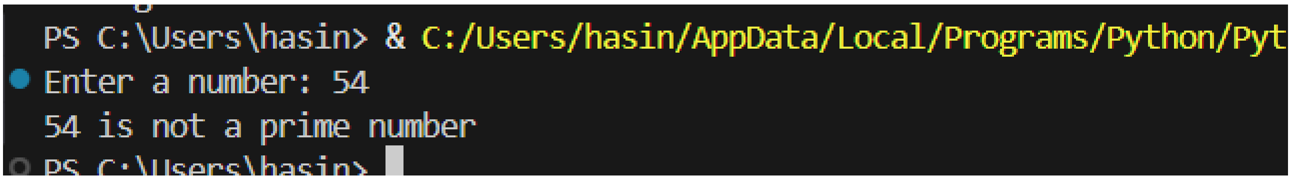


```python
#write a python code to print prime or not using basic method in an basic level of code without any function in native approach
num = int(input("Enter a number: "))
if num > 1:
    for i in range(2, num):
        if (num % i) == 0:
            print(f"{num} is not a prime number")
            break
    else:
        print(f"{num} is a prime number")
```



```
#write a python code to print prime or not using basic method in an
num = int(input("Enter a number: "))
if num > 1:
    for i in range(2, int(num**0.5) + 1):
        if (num % i) == 0:
            print(f"{num} is not a prime number")
            break
    else:
        print(f"{num} is a prime number")
else:
    print(f"{num} is not a prime number")
```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python/Pyt
Enter a number: 54
54 is not a prime number
PS C:\Users\hasin>
```

Task 9 (Transparency in Recursive Algorithms)

Objective:

Use AI to generate a recursive function to calculate

Fibonacci numbers.

Instructions:

1. Ask AI to add clear comments explaining recursion.

2. Ask AI to explain base cases and recursive

calls. Expected Output:

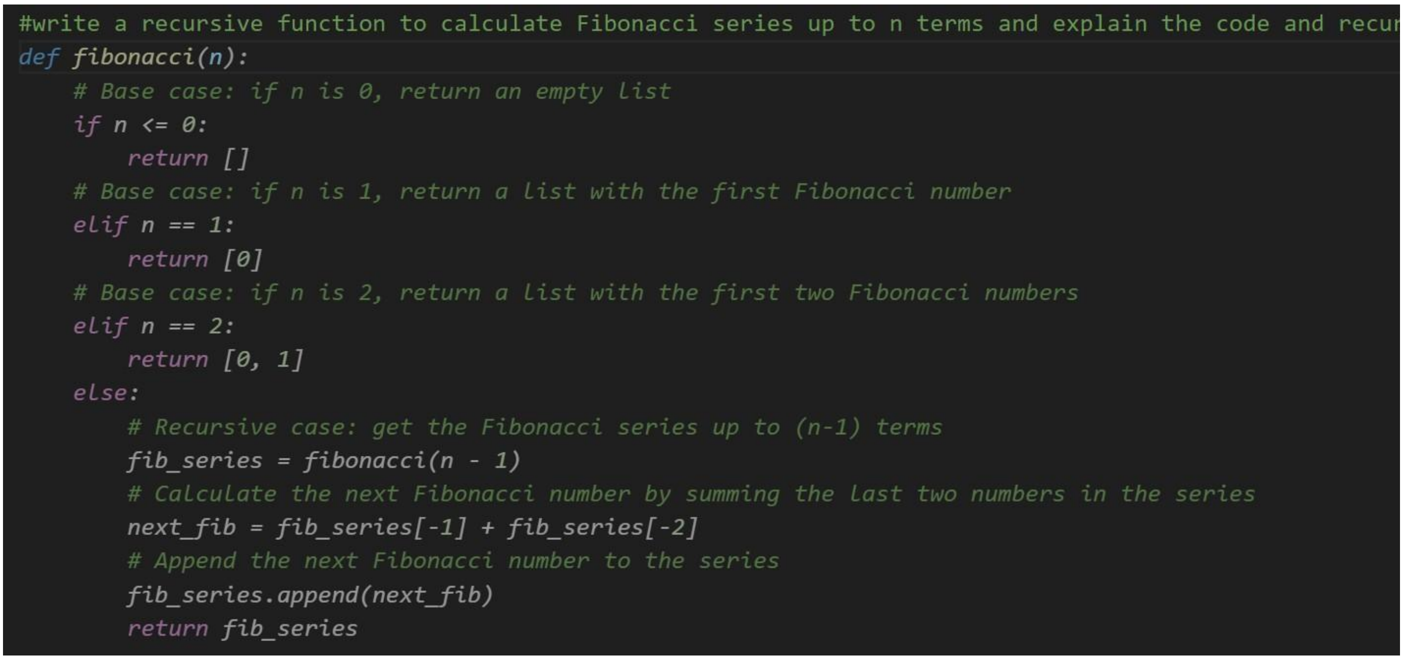
- Well-commented recursive code.

- Clear explanation of how recursion works.

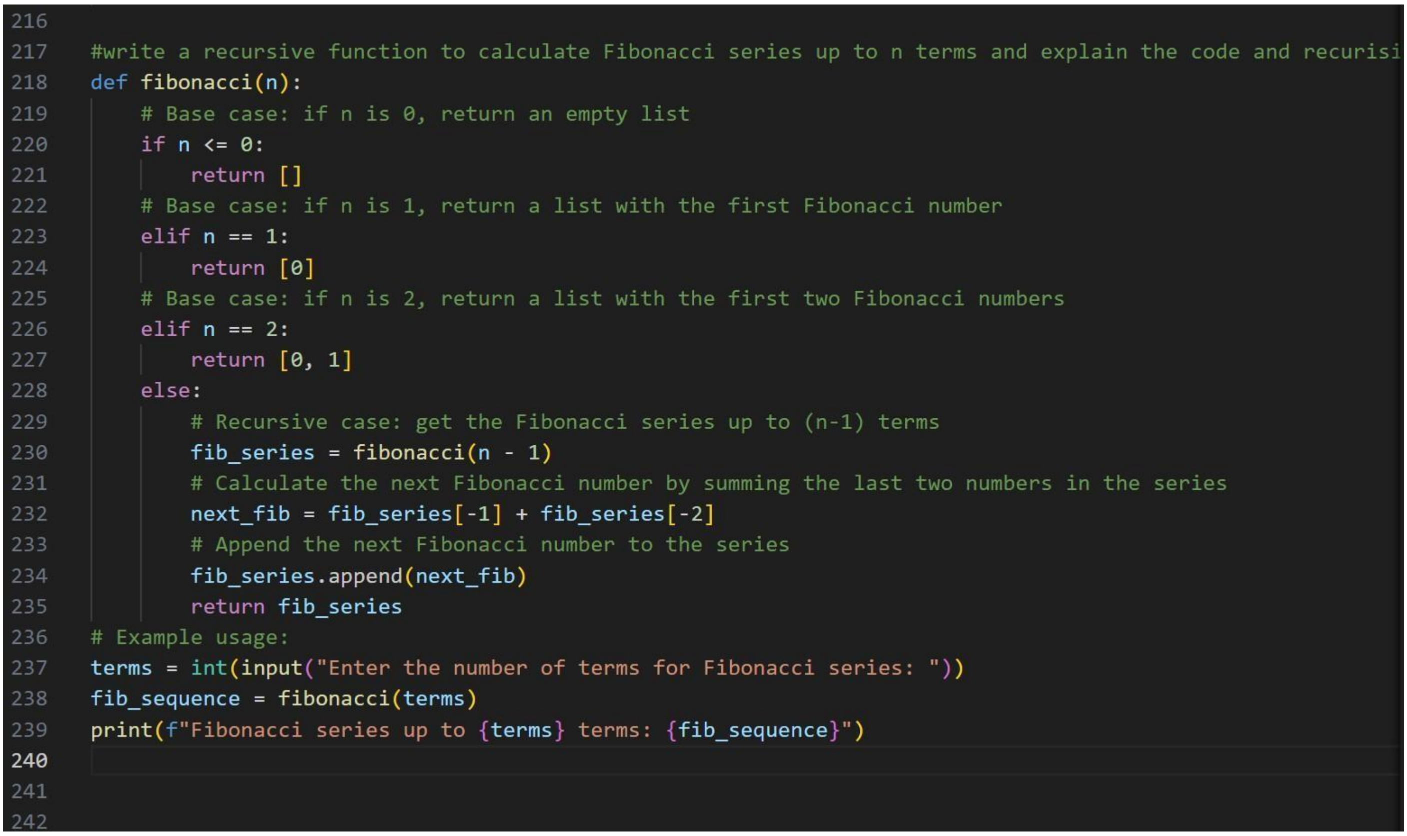
- Verification that explanation matches actual execution.

Prompt:

#write a recursive function to calculate Fibonacci series up to n terms and explain the code and recurision in comments



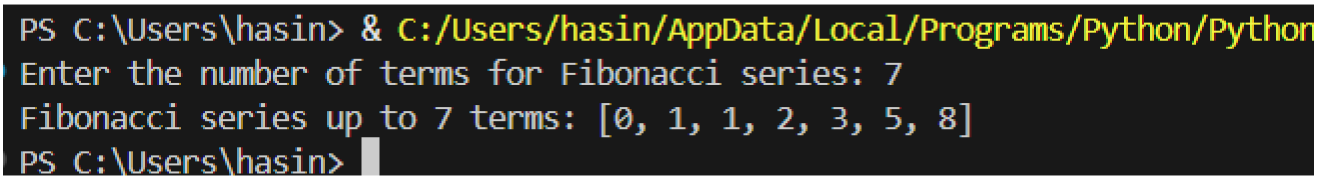
```python
#write a recursive function to calculate Fibonacci series up to n terms and explain the code and recur
def fibonacci(n):
    # Base case: if n is 0, return an empty list
    if n <= 0:
        return []
    # Base case: if n is 1, return a list with the first Fibonacci number
    elif n == 1:
        return [0]
    # Base case: if n is 2, return a list with the first two Fibonacci numbers
    elif n == 2:
        return [0, 1]
    else:
        # Recursive case: get the Fibonacci series up to (n-1) terms
        fib_series = fibonacci(n - 1)
        # Calculate the next Fibonacci number by summing the last two numbers in the series
        next_fib = fib_series[-1] + fib_series[-2]
        # Append the next Fibonacci number to the series
        fib_series.append(next_fib)
        return fib_series
```



```python

#write a recursive function to calculate Fibonacci series up to n terms and explain the code and recurisi
def fibonacci(n):
    # Base case: if n is 0, return an empty list
    if n <= 0:
        return []
    # Base case: if n is 1, return a list with the first Fibonacci number
    elif n == 1:
        return [0]
    # Base case: if n is 2, return a list with the first two Fibonacci numbers
    elif n == 2:
        return [0, 1]
    else:
        # Recursive case: get the Fibonacci series up to (n-1) terms
        fib_series = fibonacci(n - 1)
        # Calculate the next Fibonacci number by summing the last two numbers in the series
        next_fib = fib_series[-1] + fib_series[-2]
        # Append the next Fibonacci number to the series
        fib_series.append(next_fib)
        return fib_series
# Example usage:
terms = int(input("Enter the number of terms for Fibonacci series: "))
fib_sequence = fibonacci(terms)
print(f"Fibonacci series up to {terms} terms: {fib_sequence}")
```

Output:



```
PS C:\Users\hasin> & C:/Users/hasin/AppData/Local/Programs/Python/Python
Enter the number of terms for Fibonacci series: 7
Fibonacci series up to 7 terms: [0, 1, 1, 2, 3, 5, 8]
PS C:\Users\hasin>
```

Task Description 10 (Transparency in Error Handling)

Task: Use AI to generate a Python program that reads a file and processes data.

Prompt:

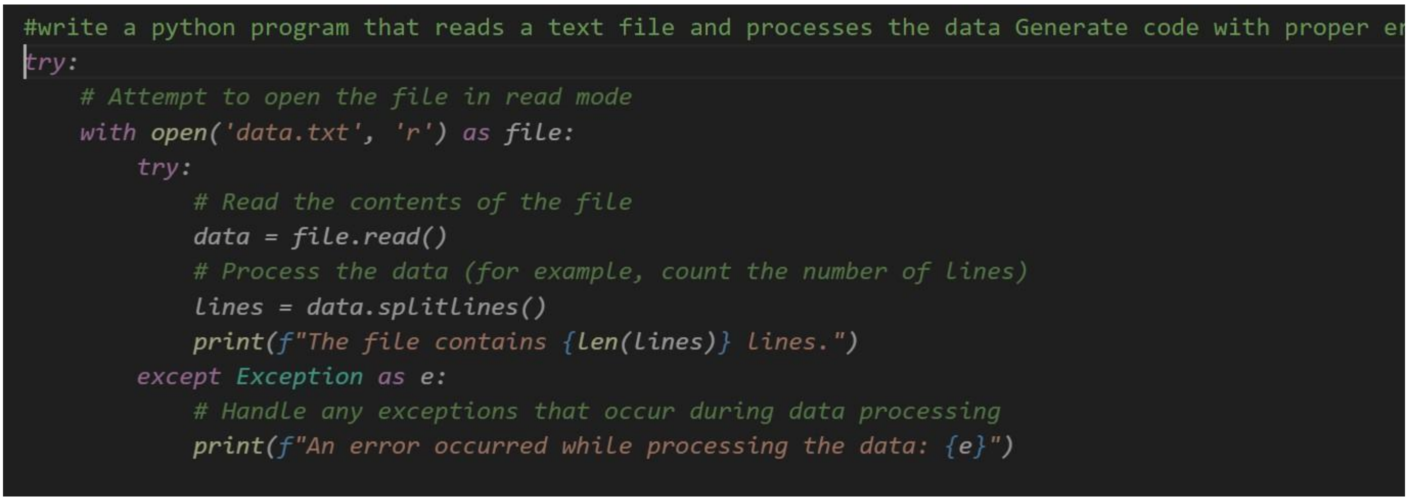
> “Generate code with proper error handling and clear explanations for each exception.”

Expected Output:

- Code with meaningful exception handling.
- Clear comments explaining each error scenario.
- Validation that explanations align with runtime behavior.

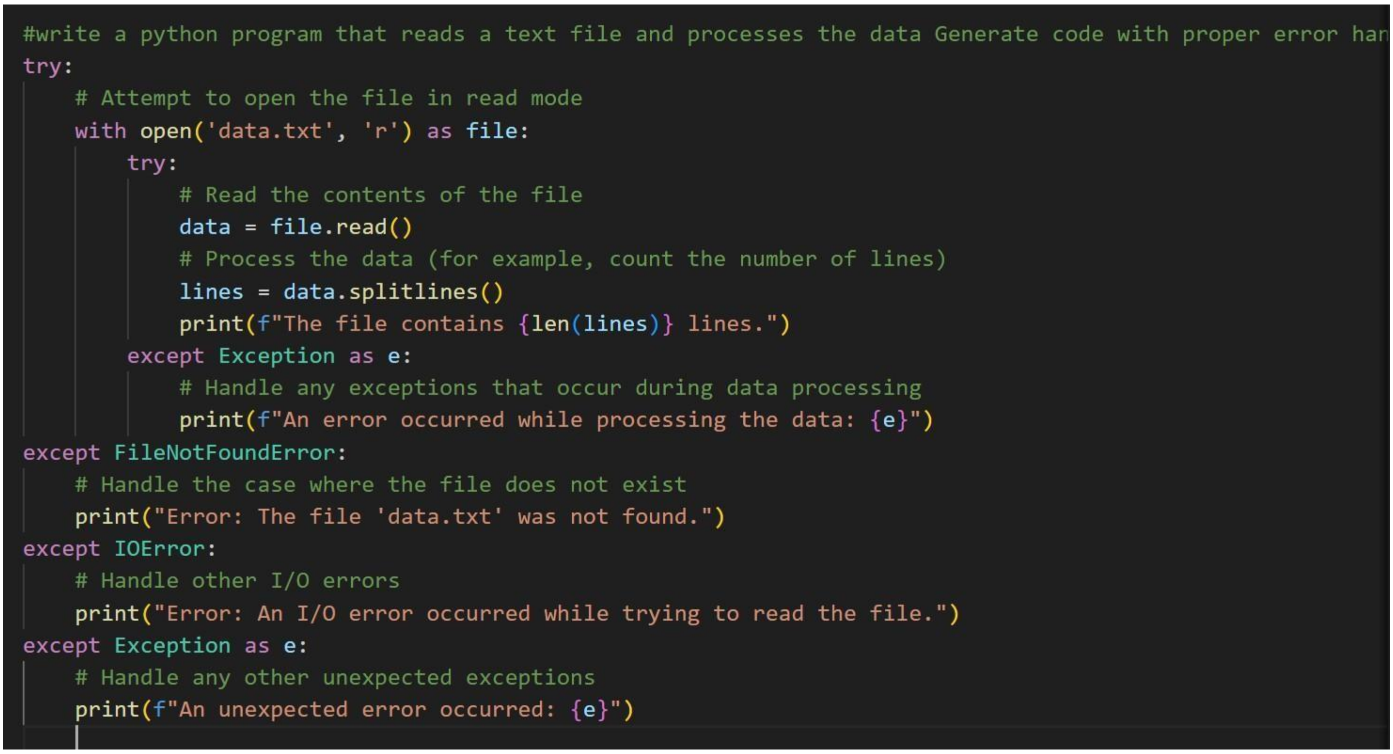
Prompt:

#write a python program that reads a text file and processes the data Generate code with proper error handling and clear explanations for each exception



```
#write a python program that reads a text file and processes the data Generate code with proper er
try:
    # Attempt to open the file in read mode
    with open('data.txt', 'r') as file:
        try:
            # Read the contents of the file
            data = file.read()
            # Process the data (for example, count the number of lines)
            lines = data.splitlines()
            print(f"The file contains {len(lines)} lines.")
        except Exception as e:
            # Handle any exceptions that occur during data processing
            print(f"An error occurred while processing the data: {e}")
```

-



```python
#write a python program that reads a text file and processes the data Generate code with proper error han
try:
    # Attempt to open the file in read mode
    with open('data.txt', 'r') as file:
        try:
            # Read the contents of the file
            data = file.read()
            # Process the data (for example, count the number of lines)
            lines = data.splitlines()
            print(f"The file contains {len(lines)} lines.")
        except Exception as e:
            # Handle any exceptions that occur during data processing
            print(f"An error occurred while processing the data: {e}")
except FileNotFoundError:
    # Handle the case where the file does not exist
    print("Error: The file 'data.txt' was not found.")
except IOError:
    # Handle other I/O errors
    print("Error: An I/O error occurred while trying to read the file.")
except Exception as e:
    # Handle any other unexpected exceptions
    print(f"An unexpected error occurred: {e}")
```

Explanation:
That error-handling block tries to open data.txt and read it safely: the outer try opens the file, and if it’s missing it catches FileNotFoundError, while other I/O problems are caught by IOError. Inside, a nested try handles problems that might occur while processing the file content (like splitting or counting), and any unexpected issues fall to the final generic Exception handler, so the program fails gracefully with clear messages instead of crashing.