AI Assisted Coding

Lab Assignment 6.5

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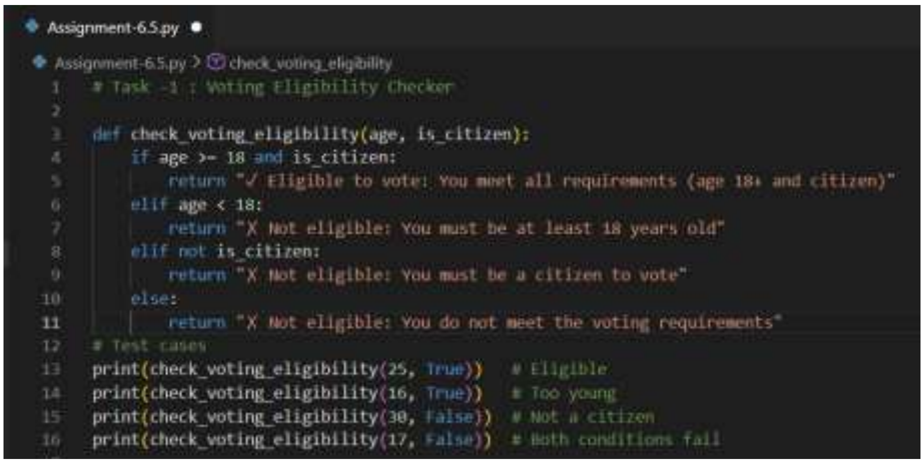
Batch No : 20

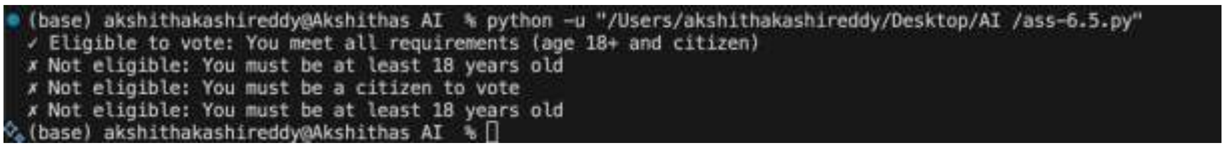
Task -1:

Prompt: Generate Python code to check voting eligibility based on age and citizenship



```python
Assignment-6.5.py
Assignment-6.5.py > check_voting_eligibility
# Task -1 : Voting Eligibility Checker

def check_voting_eligibility(age, is_citizen):
    if age >= 18 and is_citizen:
        return "✓ Eligible to vote: You meet all requirements (age 18+ and citizen)"
    elif age < 18:
        return "X Not eligible: You must be at least 18 years old"
    elif not is_citizen:
        return "X Not eligible: You must be a citizen to vote"
    else:
        return "X Not eligible: You do not meet the voting requirements"
# Test cases
print(check_voting_eligibility(25, True))   # Eligible
print(check_voting_eligibility(16, True))   # Too young
print(check_voting_eligibility(30, False))  # Not a citizen
print(check_voting_eligibility(17, False))  # Both conditions fail
```

OUTPUT :



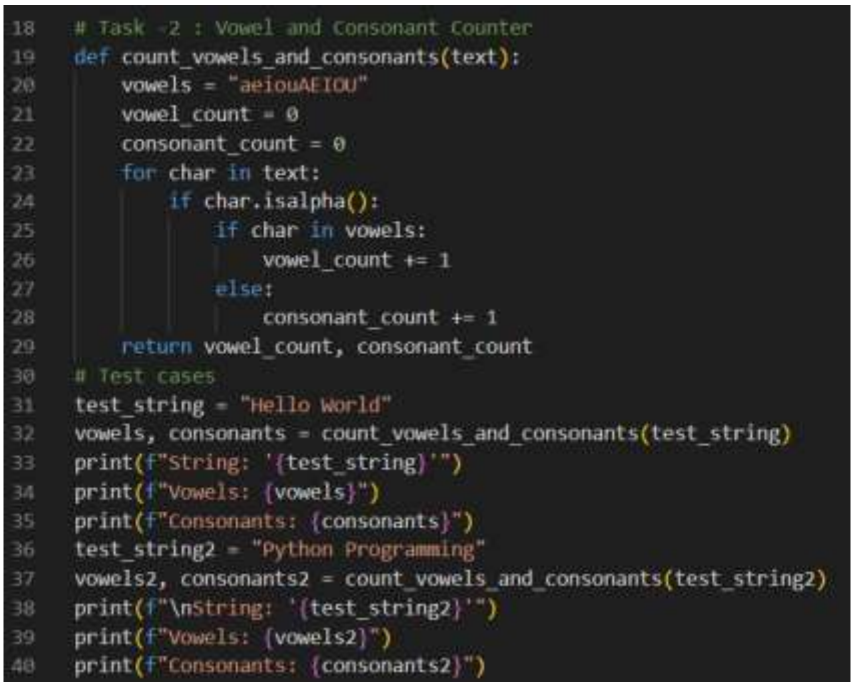
```
(base) akshithakashireddy@Akshithas AI  % python -u "/Users/akshithakashireddy/Desktop/AI /ass-6.5.py"
✓ Eligible to vote: You meet all requirements (age 18+ and citizen)
✗ Not eligible: You must be at least 18 years old
✗ Not eligible: You must be a citizen to vote
✗ Not eligible: You must be at least 18 years old
(base) akshithakashireddy@Akshithas AI  % 
```

Justification:

This program checks voting eligibility based on **age** and **citizenship** using conditional statements.
If the person is **18 or older and a citizen**, they are eligible to vote; otherwise, the program clearly states the reason for ineligibility.
It ensures correct decision-making with simple and readable logic.

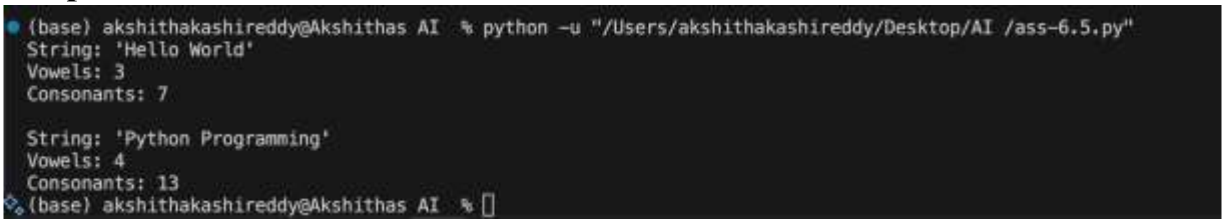
Task 2:

Prompt: Generate Python code to count vowels and consonants in a string using a loop



```python
# Task -2 : Vowel and Consonant Counter
def count_vowels_and_consonants(text):
    vowels = "aeiouAEIOU"
    vowel_count = 0
    consonant_count = 0
    for char in text:
        if char.isalpha():
            if char in vowels:
                vowel_count += 1
            else:
                consonant_count += 1
    return vowel_count, consonant_count
# Test cases
test_string = "Hello World"
vowels, consonants = count_vowels_and_consonants(test_string)
print(f"String: '{test_string}'")
print(f"Vowels: {vowels}")
print(f"Consonants: {consonants}")
test_string2 = "Python Programming"
vowels2, consonants2 = count_vowels_and_consonants(test_string2)
print(f"\nString: '{test_string2}'")
print(f"Vowels: {vowels2}")
print(f"Consonants: {consonants2}")
```

Output:

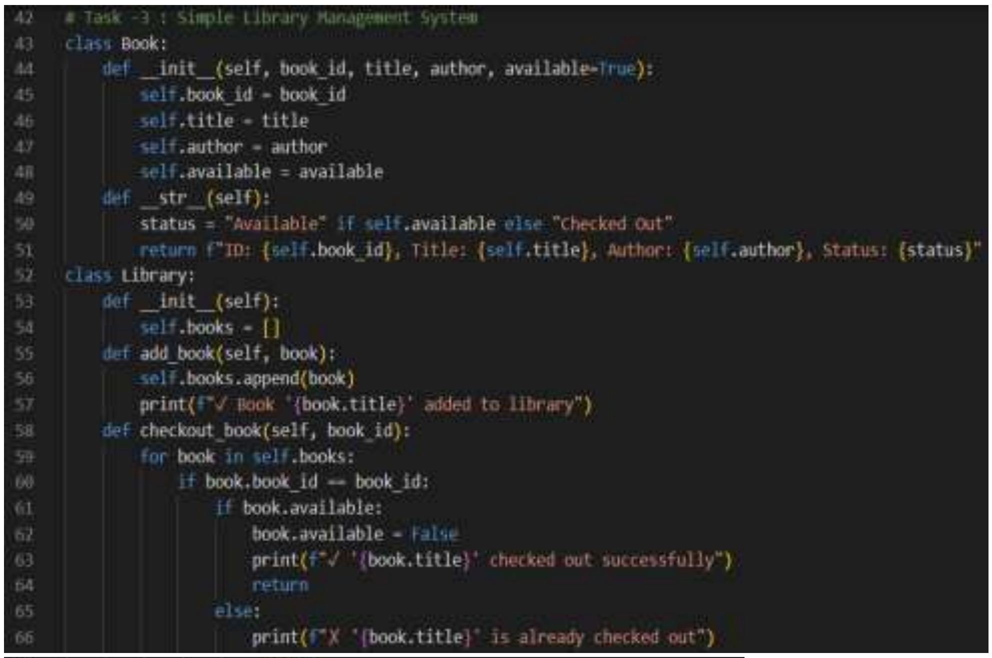


```
(base) akshithakashireddy@Akshithas AI  % python -u "/Users/akshithakashireddy/Desktop/AI /ass-6.5.py"
String: 'Hello World'
Vowels: 3
Consonants: 7

String: 'Python Programming'
Vowels: 4
Consonants: 13
(base) akshithakashireddy@Akshithas AI  %
```

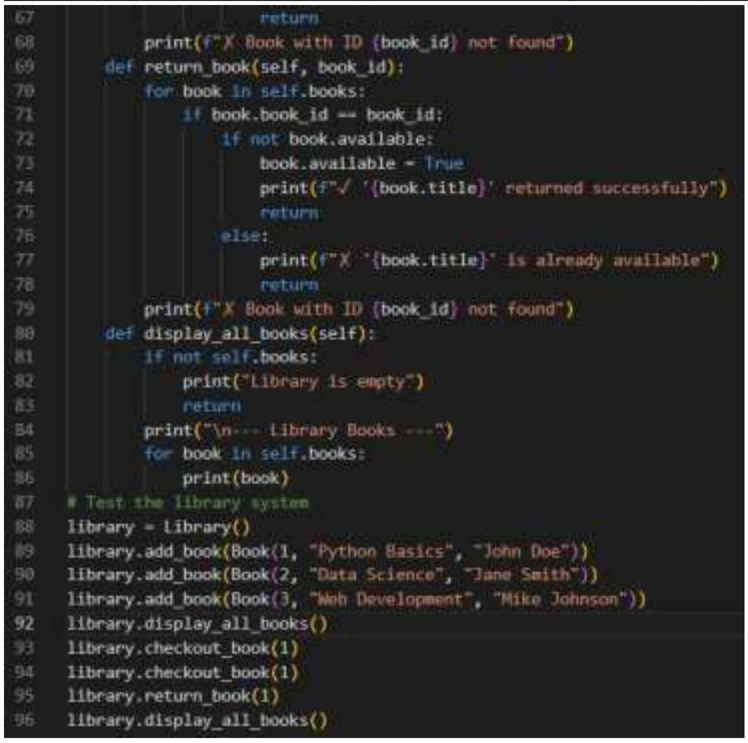
Justification:

This program counts **vowels and consonants** in a given text by iterating through each character.
It checks only **alphabetic characters** and classifies them as vowels or consonants using conditional logic.
The function returns accurate counts, ignoring spaces and special characters. **Task 3:**

Prompt : Generate a Python program for a library management system using classes, loops, and conditional statements

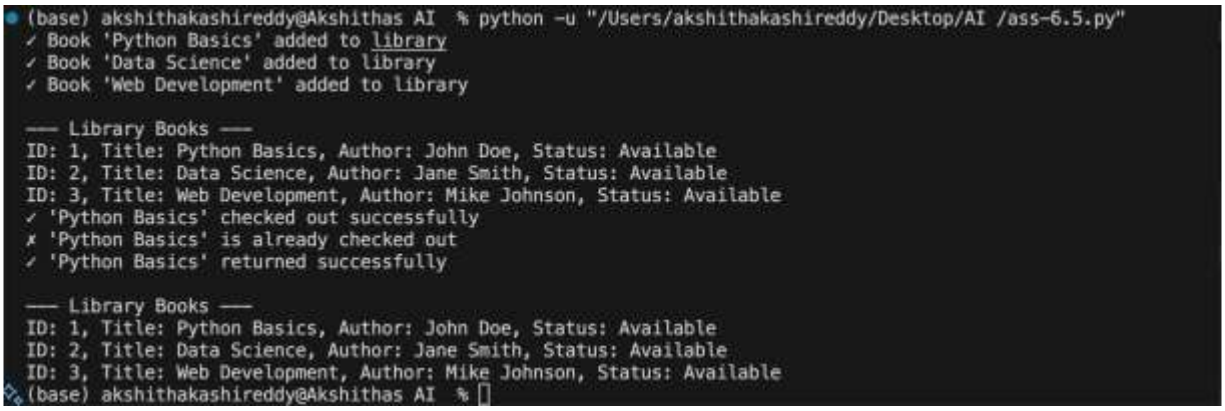


```python
# Task -3 : Simple Library Management System
class Book:
    def __init__(self, book_id, title, author, available=True):
        self.book_id = book_id
        self.title = title
        self.author = author
        self.available = available
    def __str__(self):
        status = "Available" if self.available else "Checked Out"
        return f"ID: {self.book_id}, Title: {self.title}, Author: {self.author}, Status: {status}"
class Library:
    def __init__(self):
        self.books = []
    def add_book(self, book):
        self.books.append(book)
        print(f"✓ Book '{book.title}' added to library")
    def checkout_book(self, book_id):
        for book in self.books:
            if book.book_id == book_id:
                if book.available:
                    book.available = False
                    print(f"✓ '{book.title}' checked out successfully")
                    return
                else:
                    print(f"X '{book.title}' is already checked out")
```



```python
                    return
        print(f"X Book with ID {book_id} not found")
    def return_book(self, book_id):
        for book in self.books:
            if book.book_id == book_id:
                if not book.available:
                    book.available = True
                    print(f"✓ '{book.title}' returned successfully")
                    return
                else:
                    print(f"X '{book.title}' is already available")
                    return
        print(f"X Book with ID {book_id} not found")
    def display_all_books(self):
        if not self.books:
            print("Library is empty")
            return
        print("\n--- Library Books ---")
        for book in self.books:
            print(book)
# Test the library system
library = Library()
library.add_book(Book(1, "Python Basics", "John Doe"))
library.add_book(Book(2, "Data Science", "Jane Smith"))
library.add_book(Book(3, "Web Development", "Mike Johnson"))
library.display_all_books()
library.checkout_book(1)
library.checkout_book(1)
library.return_book(1)
library.display_all_books()
```

Output :



```
(base) akshithakashireddy@Akshithas AI  % python -u "/Users/akshithakashireddy/Desktop/AI /ass-6.5.py"
 ✓ Book 'Python Basics' added to library
 ✓ Book 'Data Science' added to library
 ✓ Book 'Web Development' added to library

 --- Library Books ---
 ID: 1, Title: Python Basics, Author: John Doe, Status: Available
 ID: 2, Title: Data Science, Author: Jane Smith, Status: Available
 ID: 3, Title: Web Development, Author: Mike Johnson, Status: Available
 ✓ 'Python Basics' checked out successfully
 ✗ 'Python Basics' is already checked out
 ✓ 'Python Basics' returned successfully

 --- Library Books ---
 ID: 1, Title: Python Basics, Author: John Doe, Status: Available
 ID: 2, Title: Data Science, Author: Jane Smith, Status: Available
 ID: 3, Title: Web Development, Author: Mike Johnson, Status: Available
(base) akshithakashireddy@Akshithas AI  %
```

Justification:

This program implements a simple Library Management System using object-oriented programming concepts.
The Book class stores book details and availability, while the Library class manages adding, issuing, returning, and displaying books.
It ensures proper tracking of book status with clear messages for each operation.

Task 4 :

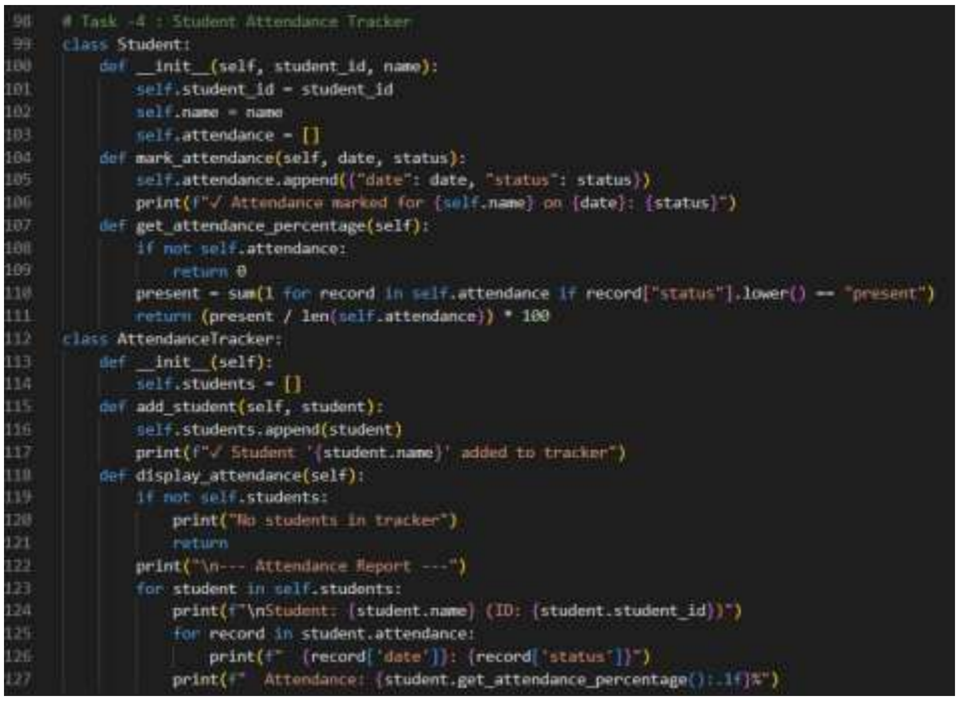
Prompt : Generate a Python class to mark and display student attendance using loops."

Expected Output:

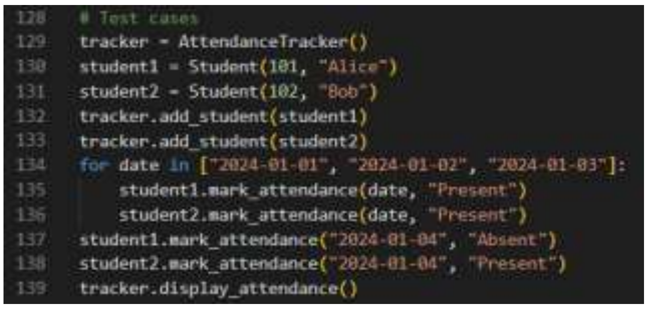
• AI-generated attendance logic.

• Correct display of attendance.

• Test cases

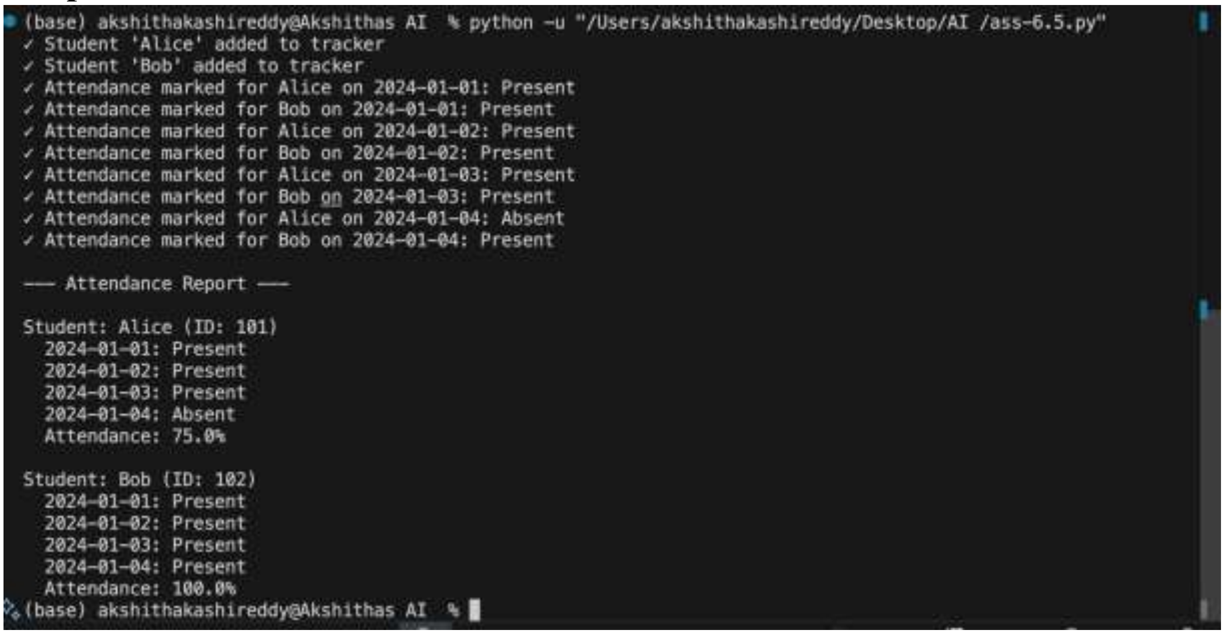


```python
# Task -4 : Student Attendance Tracker
class Student:
    def __init__(self, student_id, name):
        self.student_id = student_id
        self.name = name
        self.attendance = []
    def mark_attendance(self, date, status):
        self.attendance.append({"date": date, "status": status})
        print(f"✓ Attendance marked for {self.name} on {date}: {status}")
    def get_attendance_percentage(self):
        if not self.attendance:
            return 0
        present = sum(1 for record in self.attendance if record["status"].lower() == "present")
        return (present / len(self.attendance)) * 100
class AttendanceTracker:
    def __init__(self):
        self.students = []
    def add_student(self, student):
        self.students.append(student)
        print(f"✓ Student '{student.name}' added to tracker")
    def display_attendance(self):
        if not self.students:
            print("No students in tracker")
            return
        print("\n--- Attendance Report ---")
        for student in self.students:
            print(f"\nStudent: {student.name} (ID: {student.student_id})")
            for record in student.attendance:
                print(f"  {record['date']}: {record['status']}")
            print(f"  Attendance: {student.get_attendance_percentage():.1f}%")
```



```python
# Test cases
tracker = AttendanceTracker()
student1 = Student(101, "Alice")
student2 = Student(102, "Bob")
tracker.add_student(student1)
tracker.add_student(student2)
for date in ["2024-01-01", "2024-01-02", "2024-01-03"]:
    student1.mark_attendance(date, "Present")
    student2.mark_attendance(date, "Present")
student1.mark_attendance("2024-01-04", "Absent")
student2.mark_attendance("2024-01-04", "Present")
tracker.display_attendance()
```

Output :



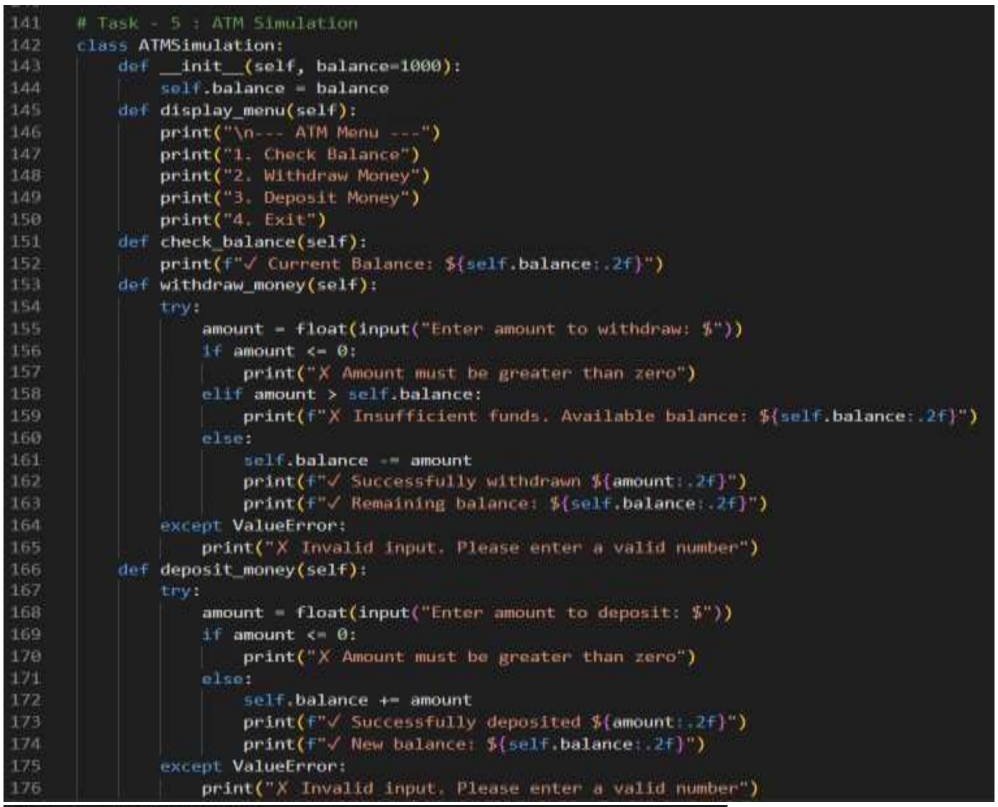
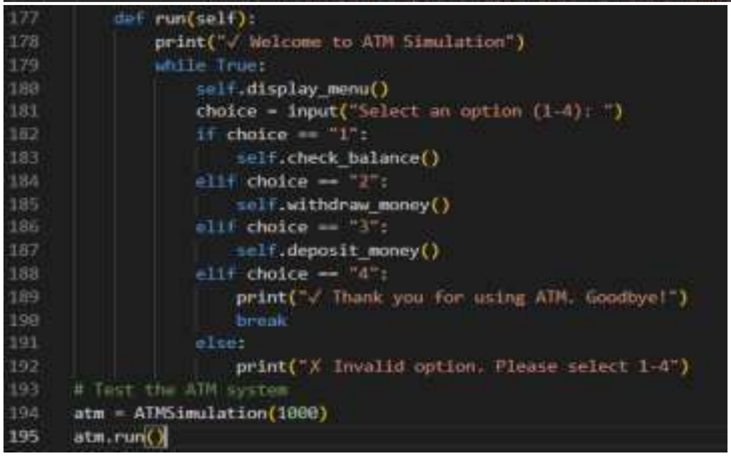
```
(base) akshithakashireddy@Akshithas AI  % python -u "/Users/akshithakashireddy/Desktop/AI /ass-6.5.py"
✓ Student 'Alice' added to tracker
✓ Student 'Bob' added to tracker
✓ Attendance marked for Alice on 2024-01-01: Present
✓ Attendance marked for Bob on 2024-01-01: Present
✓ Attendance marked for Alice on 2024-01-02: Present
✓ Attendance marked for Bob on 2024-01-02: Present
✓ Attendance marked for Alice on 2024-01-03: Present
✓ Attendance marked for Bob on 2024-01-03: Present
✓ Attendance marked for Alice on 2024-01-04: Absent
✓ Attendance marked for Bob on 2024-01-04: Present

--- Attendance Report ---

Student: Alice (ID: 101)
  2024-01-01: Present
  2024-01-02: Present
  2024-01-03: Present
  2024-01-04: Absent
  Attendance: 75.0%

Student: Bob (ID: 102)
  2024-01-01: Present
  2024-01-02: Present
  2024-01-03: Present
  2024-01-04: Present
  Attendance: 100.0%
(base) akshithakashireddy@Akshithas AI  %
```

Justification:

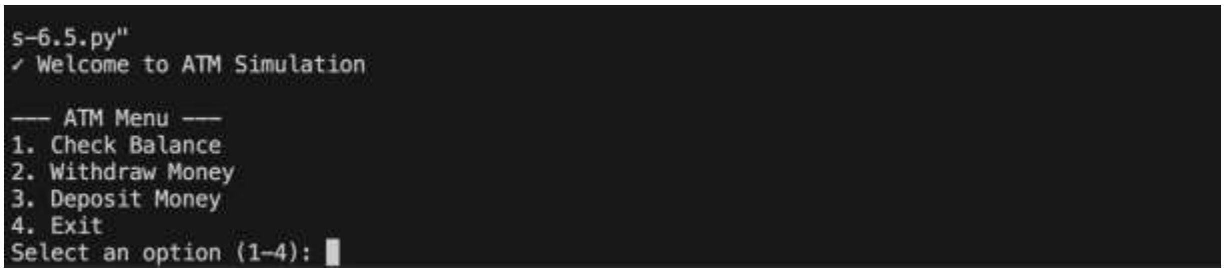
This program tracks **student attendance** using objectoriented principles.

The Student class records daily attendance and calculates attendance percentage, while the Attendance Tracker class manages multiple students and generates reports.
It provides a clear and structured way to monitor attendance efficiently **Task 5 :**

Prompt : Generate a Python program using loops and conditionals to simulate an ATM menu.


```python
# Task - 5 : ATM Simulation
class ATMSimulation:
    def __init__(self, balance=1000):
        self.balance = balance
    def display_menu(self):
        print("\n--- ATM Menu ---")
        print("1. Check Balance")
        print("2. Withdraw Money")
        print("3. Deposit Money")
        print("4. Exit")
    def check_balance(self):
        print(f"✓ Current Balance: ${self.balance:.2f}")
    def withdraw_money(self):
        try:
            amount = float(input("Enter amount to withdraw: $"))
            if amount <= 0:
                print("X Amount must be greater than zero")
            elif amount > self.balance:
                print(f"X Insufficient funds. Available balance: ${self.balance:.2f}")
            else:
                self.balance -= amount
                print(f"✓ Successfully withdrawn ${amount:.2f}")
                print(f"✓ Remaining balance: ${self.balance:.2f}")
        except ValueError:
            print("X Invalid input. Please enter a valid number")
    def deposit_money(self):
        try:
            amount = float(input("Enter amount to deposit: $"))
            if amount <= 0:
                print("X Amount must be greater than zero")
            else:
                self.balance += amount
                print(f"✓ Successfully deposited ${amount:.2f}")
                print(f"✓ New balance: ${self.balance:.2f}")
        except ValueError:
            print("X Invalid input. Please enter a valid number")
```

```python
    def run(self):
        print("✓ Welcome to ATM Simulation")
        while True:
            self.display_menu()
            choice = input("Select an option (1-4): ")
            if choice == "1":
                self.check_balance()
            elif choice == "2":
                self.withdraw_money()
            elif choice == "3":
                self.deposit_money()
            elif choice == "4":
                print("✓ Thank you for using ATM. Goodbye!")
                break
            else:
                print("X Invalid option. Please select 1-4")
# Test the ATM system
atm = ATMSimulation(1000)
atm.run()
```

Output :



```
s-6.5.py"
✓ Welcome to ATM Simulation

--- ATM Menu ---
1. Check Balance
2. Withdraw Money
3. Deposit Money
4. Exit
Select an option (1-4): █
```

Justification:

This program simulates an **ATM system** that allows users to check balance, withdraw, and deposit money.
It uses a menu-driven approach with input validation to handle invalid entries and insufficient funds.
The system ensures secure and user-friendly banking operations through clear prompts and messages.