PYTHON CASE STUDY

1. Case Study: ATM Simulation System

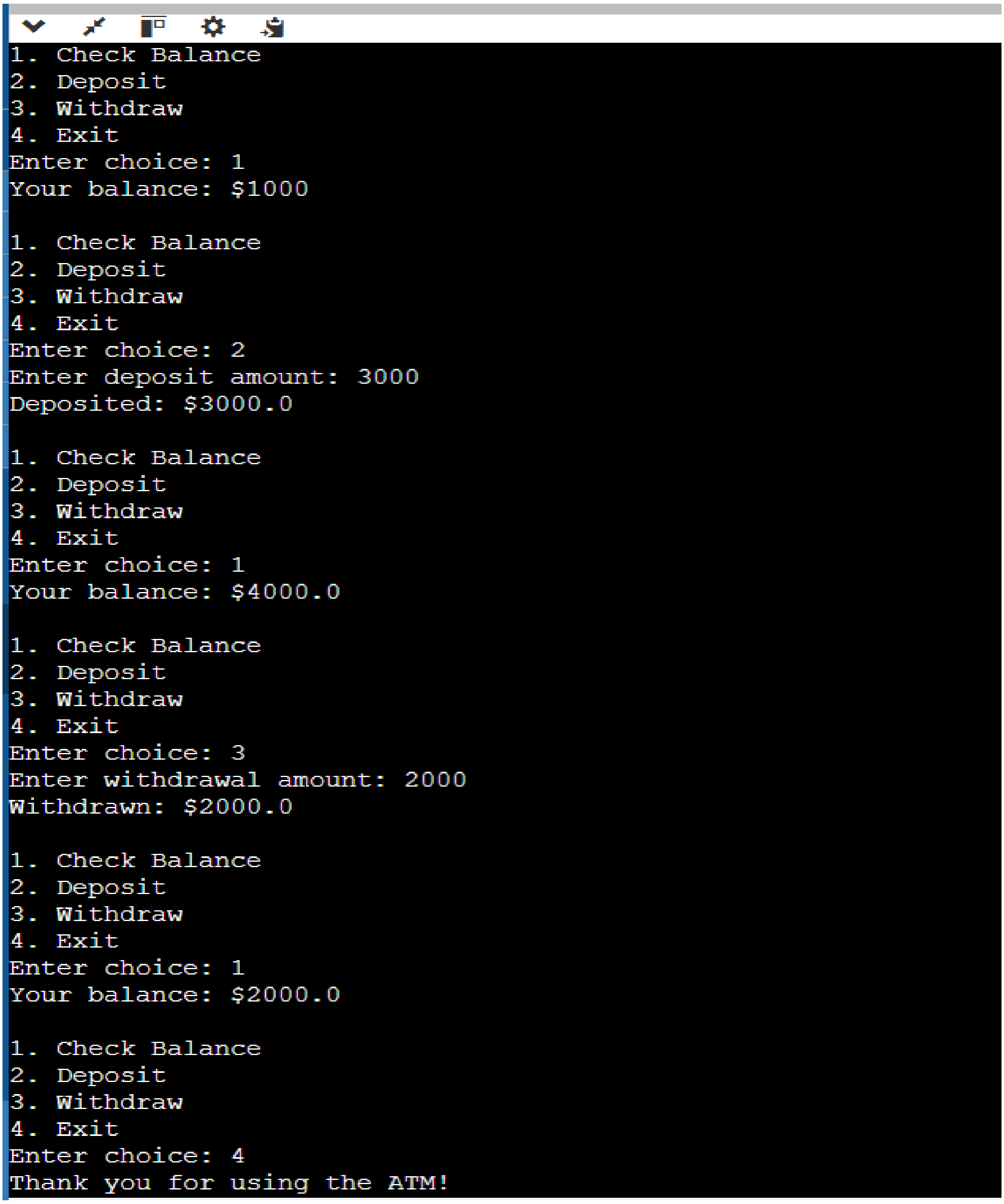
Problem Statement - Develop an ATM simulation that allows users to:

- **Check balance**
- **Deposit money**
- **Withdraw money**
- **Exit**

CODE

```
class ATM:
    def __init__(self, balance=1000):
        self.balance = balance
    def check_balance(self):
        print(f"Your balance: ${self.balance}")
    def deposit(self, amount):
        self.balance += amount
        print(f"Deposited: ${amount}")
    def withdraw(self, amount):
        if amount > self.balance:
            print("Insufficient funds!")
        else:
            self.balance -= amount
            print(f"Withdrawn: ${amount}")
def main():
    atm = ATM()
    while True:
        print("\n1. Check Balance\n2. Deposit\n3. Withdraw\n4. Exit")
        choice = input("Enter choice: ")
        if choice == "1":
            atm.check_balance()
        elif choice == "2":
            amt = float(input("Enter deposit amount: "))
            atm.deposit(amt)
        elif choice == "3":
            amt = float(input("Enter withdrawal amount: "))
            atm.withdraw(amt)
        elif choice == "4":
            print("Thank you for using the ATM!")
            break
        else:
            print("Invalid choice! Try again.")
main()
```

OUTPUT



```
1. Check Balance
2. Deposit
3. Withdraw
4. Exit
Enter choice: 1
Your balance: $1000

1. Check Balance
2. Deposit
3. Withdraw
4. Exit
Enter choice: 2
Enter deposit amount: 3000
Deposited: $3000.0

1. Check Balance
2. Deposit
3. Withdraw
4. Exit
Enter choice: 1
Your balance: $4000.0

1. Check Balance
2. Deposit
3. Withdraw
4. Exit
Enter choice: 3
Enter withdrawal amount: 2000
Withdrawn: $2000.0

1. Check Balance
2. Deposit
3. Withdraw
4. Exit
Enter choice: 1
Your balance: $2000.0

1. Check Balance
2. Deposit
3. Withdraw
4. Exit
Enter choice: 4
Thank you for using the ATM!
```

2. Case Study: E-commerce Order Management

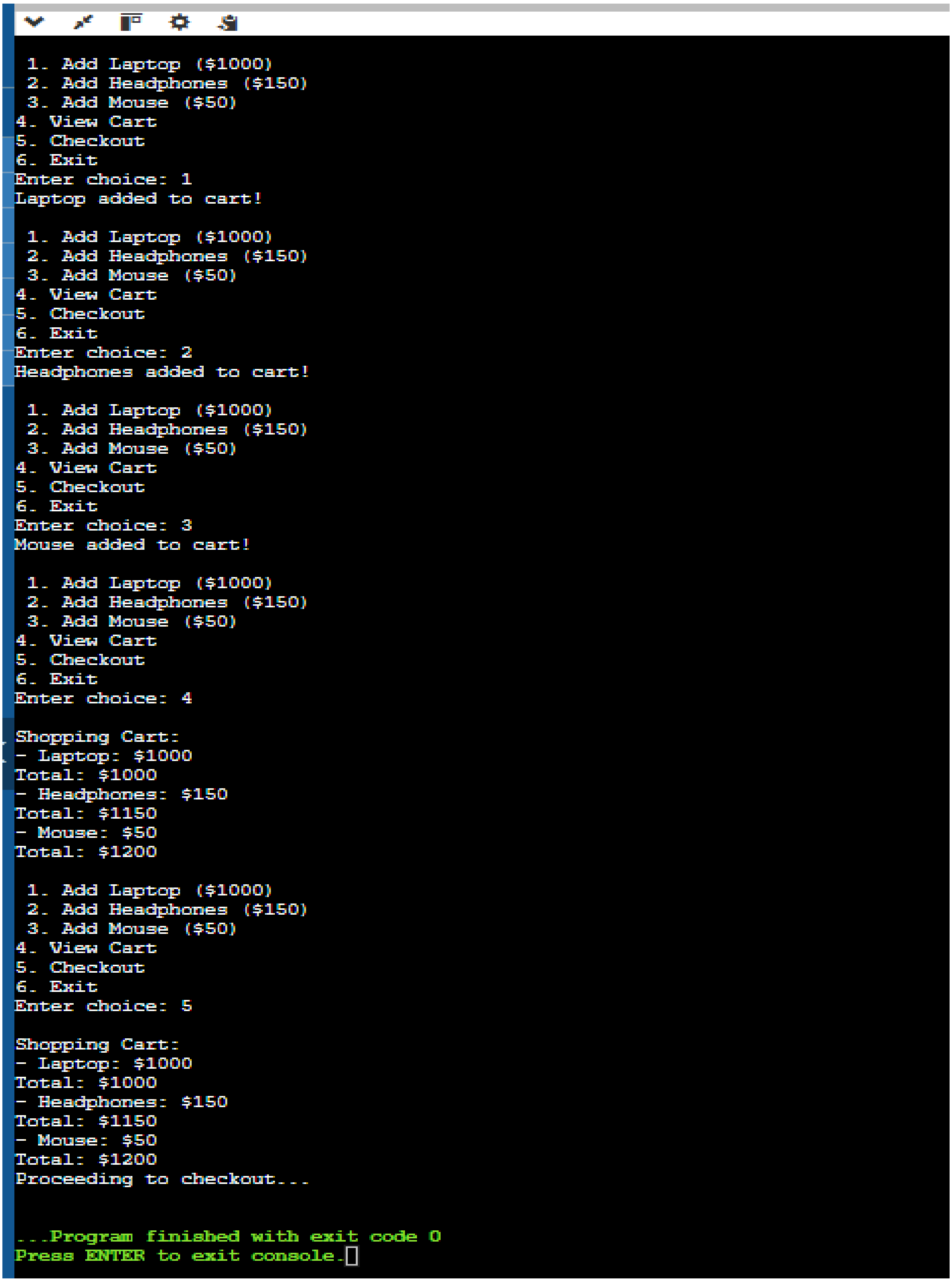
Problem Statement Create an Order Management System for an e-commerce platform. The system should allow:

- **Adding products to a cart**
- **Viewing the cart**
- **Checking out (calculating total price)**

CODE

```
class Product:
    def __init__(self, name, price):
        self.name = name
        self.price = price
class ShoppingCart:
    def __init__(self):
        self.cart = []
    def add_product(self, product):
        self.cart.append(product)
        print(f"{product.name} added to cart!")
    def view_cart(self):
        if not self.cart:
            print("Cart is empty!")
        else:
            print("\nShopping Cart:")
            total = 0
            for p in self.cart:
                print(f"- {p.name}: ${p.price}")
                total += p.price
                print(f"Total: ${total}")
    def checkout(self):
        if not self.cart:
            print("Cart is empty!")
        else:
            self.view_cart()
            print("Proceeding to checkout...")
def main():
    cart = ShoppingCart()
    products = {
        "1": Product("Laptop", 1000),
        "2": Product("Headphones", 150),
        "3": Product("Mouse", 50),
    }
    while True:
        print("\n 1. Add Laptop ($1000)\n 2. Add Headphones ($150)\n 3. Add Mouse ($50)\n4. View Cart\n5. Checkout\n6. Exit")
        choice = input("Enter choice: ")
        if choice in products:
            cart.add_product(products[choice])
        elif choice == "4":
            cart.view_cart()
        elif choice == "5":
            cart.checkout()
            break
        elif choice == "6":
            print("Thank you for shopping!")
            break
        else:
            print("Invalid choice!")
main()
```

OUTPUT



```
 1. Add Laptop ($1000)
 2. Add Headphones ($150)
 3. Add Mouse ($50)
4. View Cart
5. Checkout
6. Exit
Enter choice: 1
Laptop added to cart!

 1. Add Laptop ($1000)
 2. Add Headphones ($150)
 3. Add Mouse ($50)
4. View Cart
5. Checkout
6. Exit
Enter choice: 2
Headphones added to cart!

 1. Add Laptop ($1000)
 2. Add Headphones ($150)
 3. Add Mouse ($50)
4. View Cart
5. Checkout
6. Exit
Enter choice: 3
Mouse added to cart!

 1. Add Laptop ($1000)
 2. Add Headphones ($150)
 3. Add Mouse ($50)
4. View Cart
5. Checkout
6. Exit
Enter choice: 4

Shopping Cart:
- Laptop: $1000
Total: $1000
- Headphones: $150
Total: $1150
- Mouse: $50
Total: $1200

 1. Add Laptop ($1000)
 2. Add Headphones ($150)
 3. Add Mouse ($50)
4. View Cart
5. Checkout
6. Exit
Enter choice: 5

Shopping Cart:
- Laptop: $1000
Total: $1000
- Headphones: $150
Total: $1150
- Mouse: $50
Total: $1200
Proceeding to checkout...


...Program finished with exit code 0
Press ENTER to exit console.
```

3. Case Study: Student Grade Management System

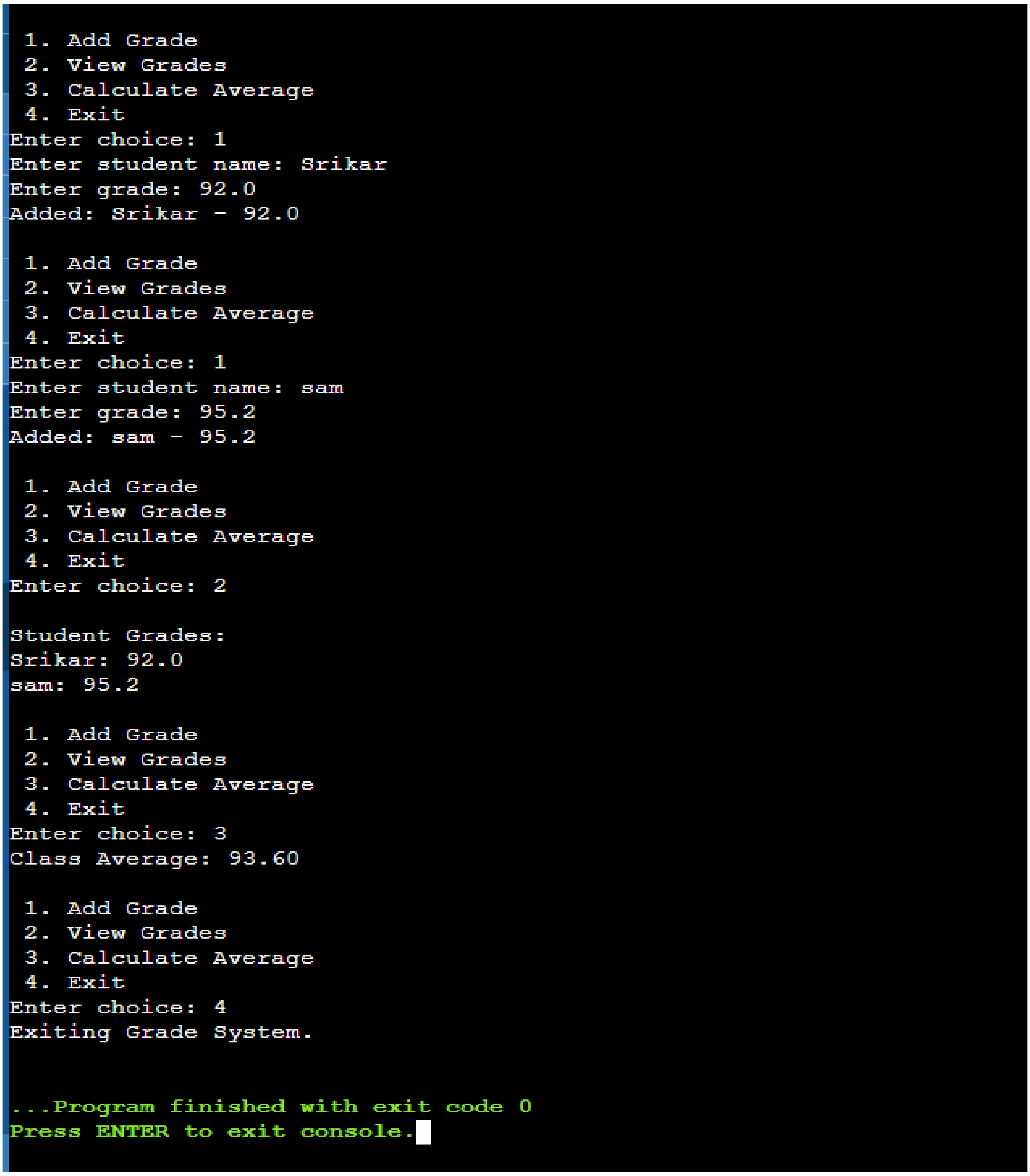
Problem Statement Develop a system to manage student grades:

- **Add student grades**
- **View student grades**
- **Calculate the average grade**

CODE

```
class GradeSystem:
    def __init__(self):
        self.grades = {}
    def add_grade(self, name, grade):
        self.grades[name] = grade
        print(f"Added: {name} - {grade}")
    def view_grades(self):
        if not self.grades:
            print("No grades available!")
        else:
            print("\nStudent Grades:")
            for name, grade in self.grades.items():
                print(f"{name}: {grade}")
    def calculate_average(self):
        if not self.grades:
            print("No grades available!")
        else:
            avg = sum(self.grades.values()) / len(self.grades)
            print(f"Class Average: {avg:.2f}")
def main():
    system = GradeSystem()
    while True:
        print("\n 1. Add Grade\n 2. View Grades\n 3. Calculate Average\n 4. Exit")
        choice = input("Enter choice: ")
        if choice == "1":
            name = input("Enter student name: ")
            grade = float(input("Enter grade: "))
            system.add_grade(name, grade)
        elif choice == "2":
            system.view_grades()
        elif choice == "3":
            system.calculate_average()
        elif choice == "4":
            print("Exiting Grade System.")
            break
        else:
            print("Invalid choice!")
main()
```

OUTPUT



```
 1. Add Grade
 2. View Grades
 3. Calculate Average
 4. Exit
Enter choice: 1
Enter student name: Srikar
Enter grade: 92.0
Added: Srikar - 92.0

 1. Add Grade
 2. View Grades
 3. Calculate Average
 4. Exit
Enter choice: 1
Enter student name: sam
Enter grade: 95.2
Added: sam - 95.2

 1. Add Grade
 2. View Grades
 3. Calculate Average
 4. Exit
Enter choice: 2

Student Grades:
Srikar: 92.0
sam: 95.2

 1. Add Grade
 2. View Grades
 3. Calculate Average
 4. Exit
Enter choice: 3
Class Average: 93.60

 1. Add Grade
 2. View Grades
 3. Calculate Average
 4. Exit
Enter choice: 4
Exiting Grade System.


...Program finished with exit code 0
Press ENTER to exit console.
```

4. Case Study: Hospital Patient Management

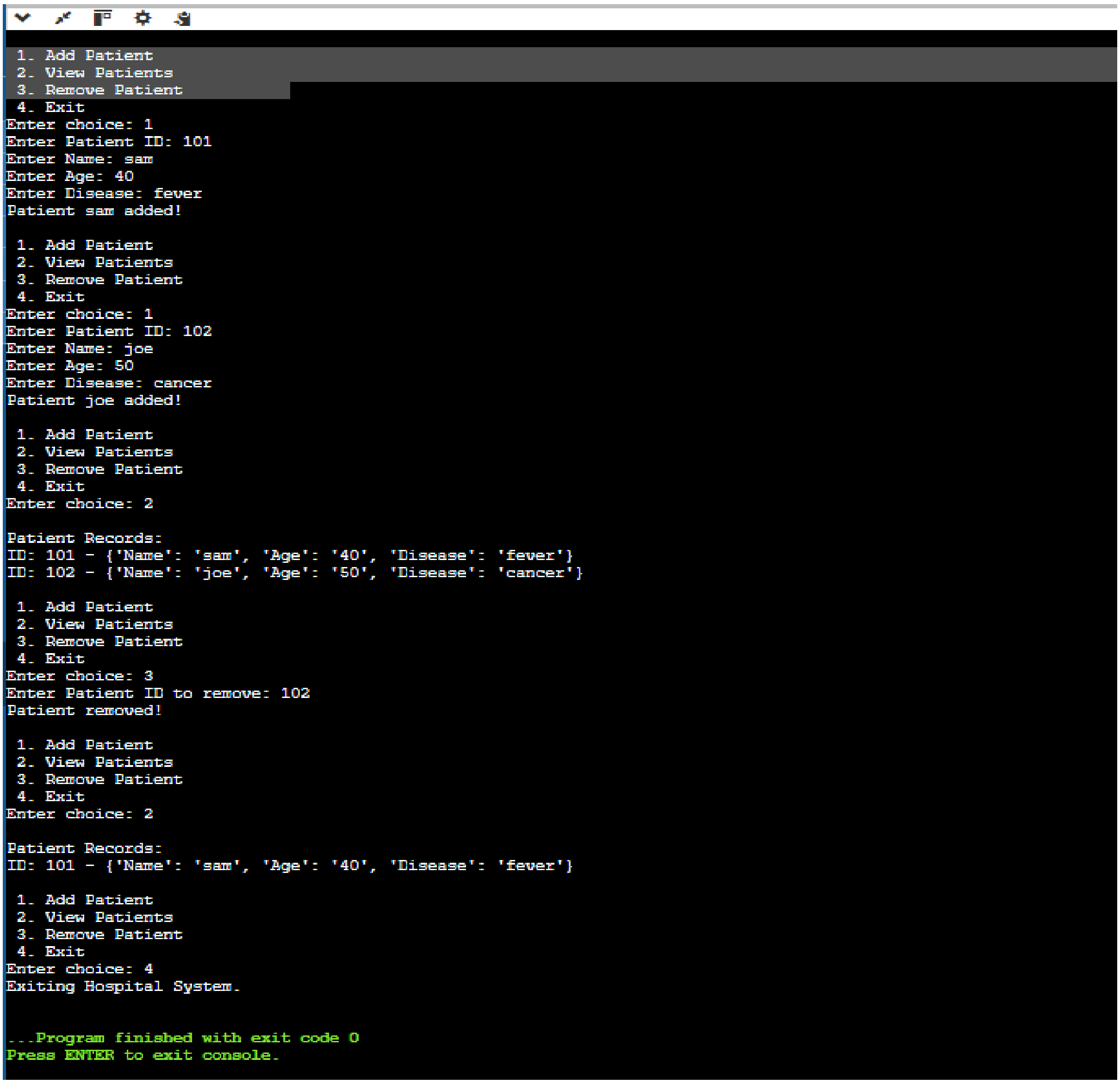
Problem Statement Create a hospital management system that:

- **Adds new patients**
- **Displays patient details**
- **Deletes patients**

CODE

```
class Hospital:
    def __init__(self):
        self.patients = {}
    def add_patient(self, id, name, age, disease):
        self.patients[id] = {"Name": name, "Age": age, "Disease": disease}
        print(f"Patient {name} added!")
    def view_patients(self):
        if not self.patients:
            print("No patients registered!")
        else:
            print("\nPatient Records:")
            for id, details in self.patients.items():
                print(f"ID: {id} - {details}")
    def remove_patient(self, id):
        if id in self.patients:
            del self.patients[id]
            print("Patient removed!")
        else:
            print("Patient not found!")
def main():
    hospital = Hospital()
    while True:
        print("\n 1. Add Patient\n 2. View Patients\n 3. Remove Patient\n 4. Exit")
        choice = input("Enter choice: ")
        if choice == "1":
            id = input("Enter Patient ID: ")
            name = input("Enter Name: ")
            age = input("Enter Age: ")
            disease = input("Enter Disease: ")
            hospital.add_patient(id, name, age, disease)
        elif choice == "2":
            hospital.view_patients()
        elif choice == "3":
            id = input("Enter Patient ID to remove: ")
            hospital.remove_patient(id)
        elif choice == "4":
            print("Exiting Hospital System.")
            break
        else:
            print("Invalid choice!")
main()
```

OUTPUT



```
 1. Add Patient
 2. View Patients
 3. Remove Patient
 4. Exit
Enter choice: 1
Enter Patient ID: 101
Enter Name: sam
Enter Age: 40
Enter Disease: fever
Patient sam added!

 1. Add Patient
 2. View Patients
 3. Remove Patient
 4. Exit
Enter choice: 1
Enter Patient ID: 102
Enter Name: joe
Enter Age: 50
Enter Disease: cancer
Patient joe added!

 1. Add Patient
 2. View Patients
 3. Remove Patient
 4. Exit
Enter choice: 2

Patient Records:
ID: 101 - {'Name': 'sam', 'Age': '40', 'Disease': 'fever'}
ID: 102 - {'Name': 'joe', 'Age': '50', 'Disease': 'cancer'}

 1. Add Patient
 2. View Patients
 3. Remove Patient
 4. Exit
Enter choice: 3
Enter Patient ID to remove: 102
Patient removed!

 1. Add Patient
 2. View Patients
 3. Remove Patient
 4. Exit
Enter choice: 2

Patient Records:
ID: 101 - {'Name': 'sam', 'Age': '40', 'Disease': 'fever'}

 1. Add Patient
 2. View Patients
 3. Remove Patient
 4. Exit
Enter choice: 4
Exiting Hospital System.


...Program finished with exit code 0
Press ENTER to exit console.
```