Question 1 :- Bridge Toll Management System

Problem Statement:

You are tasked with creating a Bridge Toll Management System using lists and dictionaries. The system will allow users to perform various operations related to toll collection on a bridge. Implement the following menu-based operations:

1. **Add Vehicle Entry:**
    - Collect vehicle details (Vehicle Number, Vehicle Type, and Toll Amount).
    - Add the entry to the toll management system.
2. **Display Vehicle Entries:**
    - Display details of all vehicles currently on the bridge.
3. **Calculate Total Toll Collection:**
    - Calculate and display the total toll collection.
4. **Search Vehicle by Number:**
    - Search for a vehicle entry based on its number.
5. **Exit:**
    - Exit the program.

Sample Input:

1. Add Vehicle Entry

2. Display Vehicle Entries

3. Calculate Total Toll Collection

4. Search Vehicle by Number

5. Exit

Enter your choice: 1

Enter Vehicle Number: ABC123

Enter Vehicle Type (Car/Truck/Bus): Car

Enter Toll Amount: 5.0

Enter your choice: 1

Enter Vehicle Number: XYZ456

Enter Vehicle Type (Car/Truck/Bus): Truck

Enter Toll Amount: 10.0

Enter your choice: 2

Sample Output:

Vehicle Entries:

Vehicle Number: ABC123

Vehicle Type: Car

Toll Amount: $5.0

Vehicle Number: XYZ456

Vehicle Type: Truck

Toll Amount: $10.0

Enter your choice: 3

Total Toll Collection: $15.0

Enter your choice: 4

Enter Vehicle Number to Search: XYZ456

Vehicle Details:

Vehicle Number: XYZ456

Vehicle Type: Truck

Toll Amount: $10.0

Enter your choice: 5

Solution:-

```
# Bridge Toll Management System
toll_records = []


while True:
    print("\n1. Record Toll Transaction\n2. Display Toll Records\n3. Calculate Total Revenue\n4. Search Toll Record by Vehicle Number\n5. Remove Toll Record by Vehicle Number\n6. Exit")
    choice = int(input("Enter your choice: "))


    if choice == 1:
        toll_record = {}
        toll_record['Vehicle Number'] = input("Enter Vehicle Number: ")
        toll_record['Date'] = input("Enter Date (MM/DD/YYYY): ")
        toll_record['Amount'] = float(input("Enter Toll Amount: "))
        toll_records.append(toll_record)
        print("Toll transaction recorded successfully.")
    elif choice == 2:
        print("\nToll Records:")
        for record in toll_records:
            print(f"Vehicle Number: {record['Vehicle Number']}")
            print(f"Date: {record['Date']}")
            print(f"Amount: ${record['Amount']:.2f}\n")
    elif choice == 3:
        total_revenue = 0
        for record in toll_records:
            total_revenue += record['Amount']
        print(f"\nTotal Revenue: ${total_revenue:.2f}")
    elif choice == 4:
        search_vehicle_number = input("\nEnter Vehicle Number to Search: ")
        found_record = None
```

```
    for record in toll_records:
        if record['Vehicle Number'] == search_vehicle_number:
            found_record = record
            break
    if found_record:
        print("\nToll Record:")
        print(f"Vehicle Number: {found_record['Vehicle Number']}")
        print(f"Date: {found_record['Date']}")
        print(f"Amount: ${found_record['Amount']:.2f}")
    else:
        print("Toll record not found.")
elif choice == 5:
    remove_vehicle_number = input("\nEnter Vehicle Number to Remove: ")
    found = False
    for i in range(len(toll_records)):
        if toll_records[i]['Vehicle Number'] == remove_vehicle_number:
            del toll_records[i]
            print("Toll record removed.")
            found = True
            break
    if not found:
        print("Toll record not found.")
elif choice == 6:
    print("\nExiting the Bridge Toll Management System.")
    break
else:
    print("\nInvalid choice. Please enter a valid option.")
```

Question 2 :-

Online Shopping Management System

Problem Statement:

You are tasked with creating an Online Shopping Management System using lists and dictionaries. The system will allow users to perform various operations related to managing products in an online store. Implement the following menu-based operations:

1. Add Product:
    - Collect product details (Product ID, Product Name, Quantity, and Price).
    - Add the product to the online store.
2. Display Product Catalog:
    - Display details of all products in the store.
3. Update Product Quantity:
    - Update the quantity of a specific product in the catalog.
4. Search Product by ID:
    - Search for a product based on its ID.
5. Calculate Total Cost:
    - Calculate and display the total cost of all products in the catalog.
6. Remove Product by ID:
    - Remove a product from the catalog based on its ID.
7. Exit

Sample Input:

1. Add Product

2. Display Product Catalog

3. Update Product Quantity

4. Search Product by ID

5. Calculate Total Cost

6. Remove Product by ID

7. Exit

Enter your choice: 1

Enter Product ID: P001

Enter Product Name: Laptop

Enter Quantity: 10

Enter Price: 800.0

Enter your choice: 1

Enter Product ID: P002

Enter Product Name: Smartphone

Enter Quantity: 20

Enter Price: 300.0

Enter your choice: 2

Sample Output:

Product Catalog:

Product ID: P001

Product Name: Laptop

Quantity: 10

Price: $800.0

Product ID: P002

Product Name: Smartphone

Quantity: 20

Price: $300.0

Enter your choice: 5

Total Cost of Products: $17000.0

Enter your choice: 6

Enter Product ID to Remove: P001

Product removed from the catalog.

Enter your choice: 2

Product Catalog:

Product ID: P002

Product Name: Smartphone

Quantity: 20

Price: $300.0

Enter your choice: 7

Solution :-

```
product_catalog = []

while True:
    print("\n1. Add Product\n2. Display Product Catalog\n3. Update Product Quantity\n4. Search Product by ID\n5. Calculate Total Cost\n6. Remove Product by ID\n7. Exit")
    choice = int(input("Enter your choice: "))

    if choice == 1:
        product = {}
        product['Product ID'] = input("Enter Product ID: ")
        product['Product Name'] = input("Enter Product Name: ")
        product['Quantity'] = int(input("Enter Quantity: "))
```

```
        product['Price'] = float(input("Enter Price: "))
        product_catalog.append(product)
        print("Product added to the catalog.")
    elif choice == 2:
        print("\nProduct Catalog:")
        for product in product_catalog:
            print(f"Product ID: {product['Product ID']}")
            print(f"Product Name: {product['Product Name']}")
            print(f"Quantity: {product['Quantity']}")
            print(f"Price: ${product['Price']:.2f}\n")
    elif choice == 3:
        update_id = input("\nEnter Product ID to Update Quantity: ")
        new_quantity = int(input("Enter the new Quantity: "))
        found = False
        for product in product_catalog:
            if product['Product ID'] == update_id:
                product['Quantity'] = new_quantity
                print("Product quantity updated successfully.")
                found = True
                break
        if not found:
            print("Product not found.")
    elif choice == 4:
        search_id = input("\nEnter Product ID to Search: ")
        found_product = None
        for product in product_catalog:
            if product['Product ID'] == search_id:
                found_product = product
                break
        if found_product:
            print("\nProduct Details:")
```

```
            print(f"Product ID: {found_product['Product ID']}")
            print(f"Product Name: {found_product['Product Name']}")
            print(f"Quantity: {found_product['Quantity']}")
            print(f"Price: ${found_product['Price']:.2f}")
        else:
            print("Product not found.")
    elif choice == 5:
        total_cost = 0
        for product in product_catalog:
            total_cost += product['Price'] * product['Quantity']
        print(f"\nTotal Cost of Products: ${total_cost:.2f}")
    elif choice == 6:
        remove_id = input("\nEnter Product ID to Remove: ")
        found = False
        for i in range(len(product_catalog)):
            if product_catalog[i]['Product ID'] == remove_id:
                del product_catalog[i]
                print("Product removed from the catalog.")
                found = True
                break
        if not found:
            print("Product not found.")
    elif choice == 7:
        print("\nExiting the Updated Online Shopping Management System.")
        break
    else:
        print("\nInvalid choice. Please enter a valid option.")
```

Question 3 :-

Medicine Store Management System

Problem Statement:

You are tasked with creating a Medicine Store Management System using lists and dictionaries. The system will allow users to perform various operations related to managing medicine inventory in a store. Implement the following menu-based operations:

1. **Add Medicine:**
    - Collect medicine details (Medicine ID, Medicine Name, Quantity, and Price).
    - Add the medicine to the store inventory.
2. **Display Medicine Inventory:**
    - Display details of all medicines in the store.
3. **Update Medicine Quantity:**
    - Update the quantity of a specific medicine in the inventory.
4. **Search Medicine by ID:**
    - Search for a medicine based on its ID.
5. **Exit:**
    - Exit the program.

Sample Input:

1. Add Medicine

2. Display Medicine Inventory

3. Update Medicine Quantity

4. Search Medicine by ID

5. Exit

Enter your choice: 1

Enter Medicine ID: 001

Enter Medicine Name: Paracetamol

Enter Quantity: 100

Enter Price: 2.5

Enter your choice: 1

Enter Medicine ID: 002

Enter Medicine Name: Ibuprofen

Enter Quantity: 50

Enter Price: 5.0

Enter your choice: 2

Sample Output:

Medicine Inventory:

Medicine ID: 001

Medicine Name: Paracetamol

Quantity: 100

Price: $2.5

Medicine ID: 002

Medicine Name: Ibuprofen

Quantity: 50

Price: $5.0

Enter your choice: 3

Enter Medicine ID to Update Quantity: 001

Enter the new Quantity: 120

Medicine quantity updated successfully.

Enter your choice: 4

Enter Medicine ID to Search: 002

Medicine Details:

Medicine ID: 002

Medicine Name: Ibuprofen

Quantity: 50

Price: $5.0

Enter your choice: 5

Solution :-

```
# Medicine Store Management System
medicine_inventory = []

while True:
    print("\n1. Add Medicine\n2. Display Medicine Inventory\n3. Update Medicine Quantity\n4. Search Medicine by ID\n5. Calculate Total Value\n6. Remove Medicine by ID\n7. Exit")
    choice = int(input("Enter your choice: "))

    if choice == 1:
        medicine = {}
        medicine['Medicine ID'] = input("Enter Medicine ID: ")
        medicine['Medicine Name'] = input("Enter Medicine Name: ")
        medicine['Quantity'] = int(input("Enter Quantity: "))
        medicine['Price per Unit'] = float(input("Enter Price per Unit: "))
        medicine_inventory.append(medicine)
        print("Medicine added to the inventory.")
    elif choice == 2:
        print("\nMedicine Inventory:")
        for medicine in medicine_inventory:
            print(f"Medicine ID: {medicine['Medicine ID']}")
            print(f"Medicine Name: {medicine['Medicine Name']}")
            print(f"Quantity: {medicine['Quantity']}")
            print(f"Price per Unit: ${medicine['Price per Unit']:.2f}\n")
    elif choice == 3:
        update_id = input("\nEnter Medicine ID to Update Quantity: ")
```

```
    new_quantity = int(input("Enter the new Quantity: "))
    found = False
    for medicine in medicine_inventory:
        if medicine['Medicine ID'] == update_id:
            medicine['Quantity'] = new_quantity
            print("Medicine quantity updated successfully.")
            found = True
            break
    if not found:
        print("Medicine not found.")
elif choice == 4:
    search_id = input("\nEnter Medicine ID to Search: ")
    found_medicine = None
    for medicine in medicine_inventory:
        if medicine['Medicine ID'] == search_id:
            found_medicine = medicine
            break
    if found_medicine:
        print("\nMedicine Details:")
        print(f"Medicine ID: {found_medicine['Medicine ID']}")
        print(f"Medicine Name: {found_medicine['Medicine Name']}")
        print(f"Quantity: {found_medicine['Quantity']}")
        print(f"Price per Unit: ${found_medicine['Price per Unit']:.2f}")
    else:
        print("Medicine not found.")
elif choice == 5:
    total_value = 0
    for medicine in medicine_inventory:
        total_value += medicine['Quantity'] * medicine['Price per Unit']
    print(f"\nTotal Value of Medicine Inventory: ${total_value:.2f}")
elif choice == 6:
```

```
    remove_id = input("\nEnter Medicine ID to Remove: ")
    found = False
    for i in range(len(medicine_inventory)):
        if medicine_inventory[i]['Medicine ID'] == remove_id:
            del medicine_inventory[i]
            print("Medicine removed from the inventory.")
            found = True
            break
    if not found:
        print("Medicine not found.")
elif choice == 7:
    print("\nExiting the Medicine Store Management System.")
    break
else:
    print("\nInvalid choice. Please enter a valid option.")
```

Question 4 :-

Student Admission Process Management System

Problem Statement:

You are tasked with creating a Student Admission Process Management System in a University using lists and dictionaries. The system will allow users to perform various operations related to managing student admissions. Implement the following menu-based operations:

1. **Admit Student:**
    - Collect student details (Student ID, Name, Age, and Course).
    - Admit the student to the university.
2. **Display Student List:**
    - Display details of all admitted students.
3. **Update Student Information:**
    - Update information (Name, Age, or Course) of a specific student.
4. **Search Student by ID:**
    - Search for a student based on their ID.
5. **Calculate Average Age:**
    - Calculate and display the average age of all admitted students.
6. **Remove Student by ID:**
    - Remove a student from the list based on their ID.
7. **Exit:**
    - Exit the program.

Sample Input:

1. Admit Student

2. Display Student List

3. Update Student Information

4. Search Student by ID

5. Calculate Average Age

6. Remove Student by ID

7. Exit

Enter your choice: 1

Enter Student ID: S001

Enter Name: Alice

Enter Age: 20

Enter Course: Computer Science

Enter your choice: 1

Enter Student ID: S002

Enter Name: Bob

Enter Age: 22

Enter Course: Mathematics

Enter your choice: 2

Sample Output:

Student List:

Student ID: S001

Name: Alice

Age: 20

Course: Computer Science

Student ID: S002

Name: Bob

Age: 22

Course: Mathematics

Enter your choice: 3

Enter Student ID to Update Information: S001

1. Name

2. Age

3. Course

Select the information to update: 2

Enter the new Age: 21

Student information updated successfully.

Enter your choice: 4

Enter Student ID to Search: S002

Student Details:

Student ID: S002

Name: Bob

Age: 22

Course: Mathematics

Enter your choice: 5

Average Age of Students: 21.5

Enter your choice: 6

Enter Student ID to Remove: S001

Student removed from the list.

Enter your choice: 2

Student List:

Student ID: S002

Name: Bob

Age: 22

Course: Mathematics

Enter your choice: 7

Solution –

```
# Student Admission Process Management System

student_list = []


while True:
    print("\n1. Admit Student\n2. Display Student List\n3. Update Student Information\n4. Search Student by ID\n5. Calculate Average Age\n6. Remove Student by ID\n7. Exit")
    choice = int(input("Enter your choice: "))


    if choice == 1:
        student = {}
        student['Student ID'] = input("Enter Student ID: ")
        student['Name'] = input("Enter Name: ")
        student['Age'] = int(input("Enter Age: "))
        student['Course'] = input("Enter Course: ")
        student_list.append(student)
        print("Student admitted to the university.")
    elif choice == 2:
        print("\nStudent List:")
        for student in student_list:
            print(f"Student ID: {student['Student ID']}")
            print(f"Name: {student['Name']}")
            print(f"Age: {student['Age']}")
            print(f"Course: {student['Course']}\n")
    elif choice == 3:
        update_id = input("\nEnter Student ID to Update Information: ")
        found = False
        for student in student_list:
            if student['Student ID'] == update_id:
                print("1. Name\n2. Age\n3. Course")
                update_choice = int(input("Select the information to update: "))
```

```
            if update_choice == 1:
                new_name = input("Enter the new Name: ")
                student['Name'] = new_name
                print("Student information updated successfully.")
            elif update_choice == 2:
                new_age = int(input("Enter the new Age: "))
                student['Age'] = new_age
                print("Student information updated successfully.")
            elif update_choice == 3:
                new_course = input("Enter the new Course: ")
                student['Course'] = new_course
                print("Student information updated successfully.")
            else:
                print("Invalid update choice.")
            found = True
            break
    if not found:
        print("Student not found.")
elif choice == 4:
    search_id = input("\nEnter Student ID to Search: ")
    found_student = None
    for student in student_list:
        if student['Student ID'] == search_id:
            found_student = student
            break
    if found_student:
        print("\nStudent Details:")
        print(f"Student ID: {found_student['Student ID']}")
        print(f"Name: {found_student['Name']}")
        print(f"Age: {found_student['Age']}")
        print(f"Course: {found_student['Course']}")
```

```
    else:
        print("Student not found.")
elif choice == 5:
    total_age = 0
    total_students = len(student_list)
    if total_students == 0:
        average_age = 0
    else:
        for student in student_list:
            total_age += student['Age']
        average_age = total_age / total_students
    print(f"\nAverage Age of Students: {average_age:.1f}")
elif choice == 6:
    remove_id = input("\nEnter Student ID to Remove: ")
    for i in range(len(student_list)):
        if student_list[i]['Student ID'] == remove_id:
            del student_list[i]
            print("Student removed from the list.")
            break
    else:
        print("Student not found.")
elif choice == 7:
    print("\nExiting the Student Admission Process Management System.")
    break
else:
    print("\nInvalid choice. Please enter a valid option.")
```