# ***CLASSES AND OBJECTS:***

1.Bank Account Class: Create a C++ class representing a bank account with functionalities such as deposit, withdrawal, and balance inquiry.

Sample Input:

Account Number: 1234567890

Account Holder Name: John Doe

Balance: 5000

Deposits: 2000

Withdraw: 1000

Sample Output:

Account Number: 1234567890

Account Holder Name: John Doe

Balance: 6000

2. Student Record System: Design a class to manage student records including data such as name, ID, and grades. Implement functions to calculate the average grade and display student information.

Sample Input:

Student Name: Jane Doe

Student ID: 12345

Grades: 85.5 90 87 92.5

Sample Output:

Average Grade: 88.75

3. Employee Management: Develop a class for an employee with attributes like name, salary, and employee ID. Include methods to raise the salary and display employee details.

Sample Input:

Employee Name: John Doe

Employee ID: E12345

Salary: 10000

Raise Salary by: 5000

Sample Output:

Employee Name: John Doe

Employee ID: E12345

Salary: 15000

4. Geometry Figures: Build a class hierarchy for various geometric figures (circle, rectangle, triangle) with respective properties and methods to calculate area and perimeter.

Sample Input:

circle\_r=5

rectangle l = 4, w = 6

triangle b=3, h=4

for perimeter a=3,b=4 and c=5

Sample Output:

Circle - Area: 78.5398, Perimeter: 31.4159

Rectangle - Area: 24, Perimeter: 20

Triangle - Area: 6, Perimeter: 12

5. Library Management System: Create a class for a library system that manages books, including attributes like book name, author, and availability. Implement functions for issuing and returning books.

Sample Input:

// Creating an instance of the Library class

Library library;

// Adding books to the library

library.addBook("The Great Gatsby", "F. Scott Fitzgerald");

library.addBook("To Kill a Mockingbird", "Harper Lee");

// Displaying all books in the library

library.displayBooks();

// Issuing a book

library.issueBook("The Great Gatsby");

library.displayBooks();

// Returning a book

library.returnBook("The Great Gatsby");

library.displayBooks();

Sample Output:

Books in the library:

Book Name: The Great Gatsby, Author: F. Scott Fitzgerald, Availability: Available

Book Name: To Kill a Mockingbird, Author: Harper Lee, Availability: Available

Books in the library:

Book Name: To Kill a Mockingbird, Author: Harper Lee, Availability: Available

Books in the library:

Book Name: The Great Gatsby, Author: F. Scott Fitzgerald, Availability: Available

Book Name: To Kill a Mockingbird, Author: Harper Lee, Availability: Available

6. Car Rental System: Design a class to represent cars for a rental service, including details like model, availability, and rental cost per day. Implement methods for booking and returning cars.

Sample Input:

Enter car model: Toyota Camry

Enter rental cost per day: 50

Sample Output:

Available Cars in the Rental System:

Car Model: Toyota Camry, Rental Cost Per Day: 50, Availability: Available

7. Music Player: Construct a class representing a music player with functionalities for playing, pausing, and stopping songs. Include attributes like song name and artist.

Sample Input:

Enter song name: Shape of You

Enter artist name: Ed Sheeran

Sample Output:

Now playing: Shape of You by Ed Sheeran

Sample Input:

pause

Sample Output:

Song paused

Sample Input:

stop

Sample Output:

Song stop

8. Inventory Management: Develop a class for inventory management in a store, keeping track of items, their quantity, and methods for adding or removing stock.

Sample Input:

Adding new item to inventory.

Enter item name: Laptop

Enter quantity: 10

Sample Output:

Inventory updated.

Item: Laptop, Quantity: 10

Sample Input for removing stock:

Removing stock from inventory.

Enter item name: Laptop

Enter quantity to remove: 3

Sample Output for removing stock:

Inventory updated.

Item: Laptop, Quantity: 7

9. Shape Hierarchy: Create a hierarchy of shapes (e.g., square, circle, triangle) using a base class and derive specific shapes with methods to calculate area and display shape properties.

Sample Input:

Enter the dimensions of the Square:

Side: 5

Enter the dimensions of the Circle:

Radius: 4

Enter the dimensions of the Triangle:

Base: 6

Height: 4

Sample Output:

Shape: Square

Side: 5

Area: 25

Shape: Circle

Shape: Triangle

Base: 6

Height: 4

Area: 12

Radius: 4

Area: 50.2655

10. Online Shopping Cart: Design a class for an online shopping cart that includes products, their prices, and quantities. Implement functions to add items, remove items, and calculate the total cost.

Sample Input:

Adding items to the cart.

Item: Laptop

Price: 1000

Quantity: 2

Sample Output:

Item added to cart: Laptop, Price: 1000,

Quantity: 2

Sample Input for removing items:

Removing items from the cart.

Item: Laptop

Quantity to remove: 1

Sample Output for removing items:

Item removed from cart: Laptop, Remaining Quantity: 1

Total Cost of Items in Cart: 1000

11. School Management System: Develop a class hierarchy to manage a school system. Create classes for students, teachers, courses, and implement functionalities to enroll students, assign teachers, etc.

Sample Input:

Adding a new student.

Student Name: John Doe

Student ID: 12345

Adding a new teacher.

Teacher Name: Jane Smith

Teacher ID: T1001

Enrolling a student in a course.

Student ID: 12345

Course ID: CSCI101

Assigning a teacher to a course.

Teacher ID: T1001

Course ID: CSCI101

Sample Output:

Student added successfully: John Doe, Student ID: 12345

Teacher added successfully: Jane Smith, Teacher ID: T1001

Student enrolled in course: CSCI101

Teacher assigned to course: CSCI101

12. Movie Database: Design a class representing a movie database with attributes like title, director, genre, and release year. Include methods to add, delete, and display movie details.

Sample Input:

Adding a new movie to the database.

Title: Inception

Director: Christopher Nolan

Genre: Science Fiction

Release Year: 2010

Displaying movie details.

Title: Inception

Deleting a movie from the database.

Title: Inception

Sample Output:

Movie added successfully:

Title: Inception

Director: Christopher Nolan

Genre: Science Fiction

Release Year: 2010

Movie Details:

Title: Inception

Director: Christopher Nolan

Genre: Science Fiction

Release Year: 2010

Movie deleted successfully: Inception

13. Banking System with Multiple Accounts: Extend the bank account class to handle multiple accounts, allowing functions for transfer of funds between accounts and viewing all account details.

Sample Input:

Creating multiple bank accounts.

Creating Account 1.

Account Number: 1234567890

Account Holder Name: John Doe

Initial Balance: 5000

Creating Account 2.

Account Number: 0987654321

Account Holder Name: Jane Smith

Initial Balance: 3000

Transferring funds between accounts.

From Account: 1234567890

To Account: 0987654321

Amount: 2000

Sample Output:

Accounts created successfully.

Account 1:

Account Number: 1234567890

Account Holder Name: John Doe

Balance: 5000

Account 2:

Account Number: 0987654321

Account Holder Name: Jane Smith

Balance: 3000

Funds transferred successfully.

Updated Account 1 Balance: 3000

Updated Account 2 Balance: 5000

All Account Details:

Account 1:

Account Number: 1234567890

Account Holder Name: John Doe

Balance: 3000

Account 2:

Account Number: 0987654321

Account Holder Name: Jane Smith

Balance: 5000

14. Online Reservation System: Create a class for an online reservation system (e.g., for flights, concerts) with methods to book, cancel, and display reservations

15. Social Media Profile: Design a class for a social media profile, including attributes for user information and methods to add posts, manage friends, and display the user's profile

16. Hospital Management System: Construct a class system for managing a hospital, including classes for patients, doctors, and appointments. Implement functionalities to schedule appointments and manage patient record

17. Inventory Tracking System: Develop a class for inventory tracking in a warehouse or store, with functions for tracking items, managing stock levels, and displaying item details

18. Restaurant Ordering System: Create a class system to manage orders in a restaurant, including classes for menu items, customer orders, and bill generation.

19. Vehicle Management System: Design a class structure to manage vehicles (cars, bikes, trucks) with attributes like make, model, and functionalities for renting or selling vehicles

20. Gaming System: Develop a class system for a gaming platform with classes for games, users, and scores. Include functionalities to add games, track user progress, and display high score