Class and Object Practice

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Section: B

Program: BCSE

**1) You work for a car rental company and need to create a C++ class called "Car" to manage their**

**fleet. The Car class should have attributes for make, model, year, and mileage. Implement**

**member functions to:**

**1. Get the car's information as a formatted string.**

**2. Update the car's mileage.**

**3. Check if the car is a luxury car.**

**Create an instance of the Car class with make="Toyota", model="Camry", year=2021, and**

**mileage=10000. Call the information function and print the result. Then, update the mileage by**

**500 and call the information function again. Finally, check if the car is a luxury car and print the**

**result.**

**Your implementation should demonstrate the use of classes, member functions, and object**

**instantiation in C++.**

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#include <iostream>

#include <string>

using namespace std;

class car

{

private:

    string make;

    string model;

    int year;

    int mileage;

public:

    void cars(string mk, string mdl, int yr, int mil)

    {

        make = mk;

        model = mdl;

        year = yr;

        mileage = mil;

    }

    void getInfo()

    {

        cout << "Make:" << make << " - Model: " << model << " - Year: " << year << " - Mileage: " << mileage << endl;

    }

    void updateMillage(int addMileage)

    {

        mileage += addMileage;

    }

    int isLuxury()

    {

        if (mileage >= 1500)

        {

            return 1;

        }

        else

        {

            return 0;

        }

    }

};

int main()

{

    string make, model;

    int year, mileage, upMileage;

    cin >> make;

    cin >> model;

    cin >> year;

    cin >> mileage;

    cout << "Enter your Update mileage" << endl;

    cin >> upMileage;

    car myCar;

    myCar.cars(make, model, year, mileage);

    myCar.getInfo();

    myCar.updateMillage(upMileage);

    cout << endl

         << "Update mileage\n"

         << endl;

    myCar.getInfo();

    if (myCar.isLuxury())

    {

        cout << "This is a luxury car." << endl;

    }

    else

    {

        cout << "This is not a luxury car." << endl;

    }

    return 0;

}

**2) You are building a banking application and need to create a class called "Account" in C++. The**

**Account class should have attributes for account number, account holder name, and balance.**

**Implement member functions to:**

**1. Deposit funds into the account.**

**2. Withdraw funds from the account.**

**3. Get the current balance of the account.**

**Create an instance of the Account class with account number="123456", account holder**

**name="John Doe", and initial balance=1000. Perform a deposit of 500, followed by a withdrawal**

**of 200. Finally, retrieve the current balance and print the result.**

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#include <iostream>

#include <string>

using namespace std;

class Account

{

private:

    string accountNumber;

    string accountHolderName;

    double balance;

public:

    void inputAccount()

    {

        cin >> accountNumber;

        cin.ignore();

        getline(cin, accountHolderName);

        cin >> balance;

    }

    double deposit(double amount)

    {

        if (amount > 0)

        {

            balance += amount;

        }

        else

        {

            cout << "Invalid deposit amount." << endl;

        }

        return balance;

    }

    double withdraw(double amount)

    {

        if (amount > 0 && amount <= balance)

        {

            balance -= amount;

        }

        else

        {

            cout << "Invalid or insufficient funds for withdrawal." << endl;

        }

        return balance;

    }

    void displayAccount()

    {

        cout << "\nAccount Number: " << accountNumber << endl;

        cout << "Account Holder: " << accountHolderName << endl;

        cout << "Current Balance: " << balance << "/-" << endl;

    }

};

int main()

{

    Account myAccount;

    myAccount.inputAccount();

    double depositAmount, withdrawAmount;

    char ch;

    cin >> ch;

    if (ch == 'D' || ch == 'd')

    {

        cout << "Enter amount to deposit: ";

        cin >> depositAmount;

        myAccount.deposit(depositAmount);

    }

    else if (ch == 'W' || ch == 'w')

    {

        cout << "Enter amount to withdraw: ";

        cin >> withdrawAmount;

        myAccount.withdraw(withdrawAmount);

    }

    else

    {

        cout << "your valid character is w or d" << endl;

    }

    myAccount.displayAccount();

    return 0;

}

**3) You are designing a game and need to create a class called "Player" in C++. The Player class**

**should have attributes for player name, level, and score. Implement member functions to:**

**1. Increase the player's score by a given amount.**

**2. Level up the player.**

**Create an instance of the Player class with name="Alice", level=1, and score=100. Increase the**

**score by 50 and level up the player. Print the updated player details.**

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#include <iostream>

#include <string>

using namespace std;

class Player

{

private:

    string name;

    int level;

    int score;

public:

    void inputPlayer()

    {

        getline(cin, name);

        cin >> level;

        cin >> score;

    }

    void increaseScore(int points)

    {

        if (points > 0)

        {

            score += points;

        }

        else

        {

            cout << "Score must be a positive number." << endl;

        }

    }

    void levelUp()

    {

        level++;

    }

    void displayPlayer()

    {

        cout << "\nPlayer Name: " << name << endl;

        cout << "Level: " << level << endl;

        cout << "Score: " << score << endl;

    }

};

int main()

{

    Player p;

    p.inputPlayer();

    int scoreToAdd;

    cin >> scoreToAdd;

    p.increaseScore(scoreToAdd);

    p.levelUp();

    cout << "\nUpdated Player Details:" << endl;

    p.displayPlayer();

    return 0;

}

**4) You are developing a restaurant ordering system and need to create a class called "MenuItem" in**

**C++. The MenuItem class should have attributes for item name, price, and description.**

**Implement a member function to:**

1. **Display the details of the menu item.**

**Create an instance of the MenuItem class with name="Cheeseburger", price=10.99, and**

**description="Juicy beef patty with melted cheese." Call the display function to print the menu**

**item details.**

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#include <iostream>

#include <string>

using namespace std;

class MenuItem

{

private:

    string name;

    double price;

    string description;

public:

    void inputItem()

    {

        getline(cin, name);

        cin >> price;

        cin.ignore();

        getline(cin, description);

    }

    void displayItem()

    {

        cout << "\nMenu Item Details:" << endl;

        cout << "Item: " << name << endl;

        cout << "Price: " << price << "/-" << endl;

        cout << "Description: " << description << endl;

    }

};

int main()

{

    MenuItem item;

    item.inputItem();

    item.displayItem();

    return 0;

}

**5) You are building a social media platform and need to create a class called "Post" in C++. The**

**Post class should have attributes for post ID, author name, and content. Implement member**

**functions to:**

**1. Edit the content of the post.**

**2. Display the post details.**

**Create an instance of the Post class with ID=1, author name="Jane", and content="Hello, world!"**

**Edit the post content to "Welcome to my profile!" and display the updated post details.**

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#include <iostream>

#include <string>

using namespace std;

class Post

{

private:

    int postID;

    string authorName;

    string content;

public:

    void inputPost()

    {

        cin >> postID;

        cin >> authorName;

        cin >> content;

    }

    void editContent(string newContent)

    {

        content = newContent;

    }

    void displayPost()

    {

        cout << "\nPost ID: " << postID << endl;

        cout << "Author: " << authorName << endl;

        cout << "Content: " << content << endl;

    }

};

int main()

{

    Post myPost;

    myPost.inputPost();

    string updatedContent;

    cout << "\nEnter new content to update the post: ";

    cin >> updatedContent;

    myPost.editContent(updatedContent);

    cout << "\nUpdated Post Details:\n";

    myPost.displayPost();

    return 0;

}

**6) You are working on a student management system and need to create a class called "Student" in**

**C++. The Student class should have attributes for student ID, name, and grades. Implement**

**member functions to:**

**1. Add a grade to the student's record.**

**2. Calculate the average grade for the student.**

**Create an instance of the Student class with ID="S001", name="John Smith", and grades=[85,**

**90, 78]. Add a grade of 95 to the student's record and calculate the average grade. Print the**

**average grade.**

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#include <iostream>

#include <string>

using namespace std;

class Student

{

private:

    string studentID;

    string name;

    int grades[100];

    int gradeCount;

public:

    void setStudent()

    {

        cin >> studentID;

        cin.ignore();

        getline(cin, name);

        cin >> gradeCount;

        for (int i = 0; i < gradeCount; i++)

        {

            cin >> grades[i];

        }

    }

    void addGrade(int grade)

    {

        if (gradeCount < 100)

        {

            grades[gradeCount] = grade;

            gradeCount++;

        }

    }

    double calculateAverage()

    {

        if (gradeCount == 0)

            return 0;

        int sum = 0;

        for (int i = 0; i < gradeCount; i++)

        {

            sum += grades[i];

        }

        return (sum \* 1.0) / gradeCount;

    }

    void displayAverage()

    {

        cout << "Average Grade for " << name << " (ID: " << studentID << "): ";

        cout << calculateAverage() << endl;

    }

};

int main()

{

    Student s;

    s.setStudent();

    int extraCount;

    cin >> extraCount;

    for (int i = 0; i < extraCount; i++)

    {

        int newGrade;

        cin >> newGrade;

        s.addGrade(newGrade);

    }

    s.displayAverage();

    return 0;

}

**7) You are developing a music player application and need to create a class called "Song" in C++.**

**The Song class should have attributes for song title, artist name, and duration. Implement a**

**member function to:**

**1. Display the details of the song.**

**Create an instance of the Song class with title="Bohemian Rhapsody", artist name="Queen", and**

**duration="5:55". Call the display function to print the song details.**

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#include <iostream>

#include <string>

using namespace std;

class Song

{

private:

    string title;

    string artist;

    string duration;

public:

    void inputSong()

    {

        getline(cin, title);

        getline(cin, artist);

        getline(cin, duration);

    }

    void displayDetails()

    {

        cout << "\n--- Song Details ---\n";

        cout << "Song Title: " << title << endl;

        cout << "Artist: " << artist << endl;

        cout << "Duration: " << duration << endl;

    }

};

int main()

{

    Song mySong;

    mySong.inputSong();

    mySong.displayDetails();

    return 0;

}

**8) You are building an online shopping system and need to create a class called "Product" in C++.**

**The Product class should have attributes for product ID, name, price, and quantity. Implement**

**member functions to:**

**1. Update the quantity of the product.**

**2. Display the product details.**

**Create an instance of the Product class with ID="P001", name="Smartphone", price=499.99, and**

**quantity=10. Update the quantity to 5 and display the product details.**

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#include <iostream>

#include <string>

using namespace std;

class Product

{

private:

    string productID;

    string name;

    float price;

    int quantity;

public:

    void inputProduct()

    {

        getline(cin, productID);

        getline(cin, name);

        cin >> price;

        cin >> quantity;

    }

    void updateQuantity(int newQty)

    {

        quantity = newQty;

    }

    void displayDetails()

    {

        cout << "\n--- Product Details ---\n";

        cout << "Product ID: " << productID << endl;

        cout << "Name: " << name << endl;

        cout << "Price: $" << price << endl;

        cout << "Quantity: " << quantity << endl;

    }

};

int main()

{

    Product prod;

    prod.inputProduct();

    int newQty;

    cin >> newQty;

    prod.updateQuantity(newQty);

    prod.displayDetails();

    return 0;

}

**9) You are developing a calendar application and need to create a class called "Event" in C++. The**

**Event class should have attributes for event name, date, and location. Implement a member**

**function to:**

**1. Display the details of the event.**

**Create an instance of the Event class with name="Birthday Party", date="2023-08-15", and**

**location="Park Plaza". Call the display function to print the event details.**

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#include <iostream>

#include <string>

using namespace std;

class Event

{

private:

    string name;

    string date;

    string location;

public:

    void inputEvent()

    {

        getline(cin, name);

        getline(cin, date);

        getline(cin, location);

    }

    void displayDetails()

    {

        cout << "\n--- Event Details ---\n";

        cout << "Name: " << name << endl;

        cout << "Date: " << date << endl;

        cout << "Location: " << location << endl;

    }

};

int main()

{

    Event myEvent;

    myEvent.inputEvent();

    myEvent.displayDetails();

    return 0;

}

**10) You are working on a library management system and need to create a class called**

**"Book" in C++. The Book class should have attributes for book ID, title, author, and availability**

**status. Implement member functions to:**

**1. Check out the book.**

**2. Return the book.**

**3. Display the book details.**

**Create an instance of the Book class with ID="B001", title="To Kill a Mockingbird",**

**author="Harper Lee", and availability status="available". Check out the book, return it, and**

**display the updated book details.**

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#include <iostream>

#include <string>

using namespace std;

class Book

{

private:

    string bookID;

    string title;

    string author;

public:

    void inputBook()

    {

        getline(cin, bookID);

        getline(cin, title);

        getline(cin, author);

    }

    void checkOut(char checkoutA)

    {

        if (checkoutA == 'Y' || checkoutA == 'y')

        {

            cout << "The book has been checked out.\n";

        }

        else

        {

            cout << "The book is already checked out.\n";

        }

    }

    void returnBook(char checkoutB)

    {

        if (checkoutB == 'Y' || checkoutB == 'y')

        {

            cout << "The book has been returned.\n";

        }

        else

        {

            cout << "The book is Not return.\n";

        }

    }

    void displayDetails()

    {

        cout << "\n--- Book Details ---\n";

        cout << "Book ID: " << bookID << endl;

        cout << "Title: " << title << endl;

        cout << "Author: " << author << endl;

    }

};

int main()

{

    Book myBook;

    myBook.inputBook();

    char checkoutA;

    cin >> checkoutA;

    myBook.checkOut(checkoutA);

    char checkoutB;

    cin >> checkoutB;

    myBook.returnBook(checkoutB);

    myBook.displayDetails();

    return 0;

}