

1- Create a program that defines a class called Car. The class should have a private member variable speed adding a public method setSpeed to the Car class. Use this method to set the speed to 60 and then print it.

قم بإنشاء برنامج يحدد class تسمى Car. يجب أن تحتوي class على سرعة متغيرة للعضو private مما يضيف public method setSpeed إلى class السيارة. استخدم هذه الطريقة لضبط السرعة على 60 ثم قم بطباعتها.

Output

```
Speed: 60 mph
```

Solution

```
// www.gammal.tech

#include<iostream>
using namespace std;

class Car {
private:
    int speed;

public:
    void setSpeed(int s) {
        speed = s;
    }

    void getSpeed() {
        cout << "Speed: " << speed << " mph" << endl;
    }
};

int main() {
    Car myCar;
    myCar.setSpeed(60);
    myCar.getSpeed();
    return 0;
}
```

2- Create a program with a class Rectangle that has private members length and width. Implement public methods setDimensions to set length and width, and calculateArea to calculate and print the area.

قم بإنشاء برنامج class مستطيلة لها طول وعرض private members. قم بتطبيق public methods setDimensions لتعيين الطول والعرض، وحساب المساحة لحساب المنطقة وطباعتها.

Output

Area: 15

Solution

```
// www.gammal.tech

#include<iostream>
using namespace std;

class Rectangle {
private:
    double length;
    double width;

public:
    void setDimensions(double l, double w) {
        length = l;
        width = w;
    }

    void calculateArea() {
        cout << "Area: " << length * width << endl;
    }
};

int main() {
    Rectangle myRectangle;
    myRectangle.setDimensions(5.0, 3.0);
    myRectangle.calculateArea();
    return 0;
}
```

3- Expand the previous program to add a public method calculatePerimeter to calculate and print the perimeter.

قم بتوسيع البرنامج السابق لإضافة طريقة عامة لحساب المحيط لحساب المحيط وطباعته.

Output

```
Area: 15
Perimeter: 16
```

Solution

```
// www.gammal.tech

#include<iostream>
using namespace std;

class Rectangle {
private:
    double length;
    double width;

public:
    void setDimensions(double l, double w) {
        length = l;
        width = w;
    }

    void calculateArea() {
        cout << "Area: " << length * width << endl;
    }

    void calculatePerimeter() {
        cout << "Perimeter: " << 2 * (length + width) << endl;
    }
};

int main() {
    Rectangle myRectangle;
    myRectangle.setDimensions(5.0, 3.0);
    myRectangle.calculateArea();
    myRectangle.calculatePerimeter();
    return 0;
}
```

4- Create a program that defines a class Circle with a private member radius. Implement a public method setRadius to set the radius and a calculateArea method to calculate and print the area of the circle.

Output

```
Area: 50.24
```

Solution

```
// www.gammal.tech

#include<iostream>
using namespace std;

class Circle {
private:
    double radius;

public:
    void setRadius(double r) {
        radius = r;
    }

    void calculateArea() {
        cout << "Area: " << 3.14 * radius * radius << endl;
    }
};

int main() {
    Circle myCircle;
    myCircle.setRadius(4.0);
    myCircle.calculateArea();
    return 0;
}
```

5- Extend the previous program to add a public method calculateCircumference to calculate and print the circumference.

قم بتوسيع البرنامج السابق لإضافة public method calculateCircumference لحساب المحيط وطباعته.

Output

```
Area: 50.24  
Circumference: 25.12
```

Solution

```
// www.gammal.tech  
  
#include<iostream>  
using namespace std;  
  
class Circle {  
private:  
    double radius;  
  
public:  
    void setRadius(double r) {  
        radius = r;  
    }  
  
    void calculateArea() {  
        cout << "Area: " << 3.14 * radius * radius << endl;  
    }  
  
    void calculateCircumference() {  
        cout << "Circumference: " << 2 * 3.14 * radius << endl;  
    }  
};  
  
int main() {  
    Circle myCircle;  
    myCircle.setRadius(4.0);  
    myCircle.calculateArea();  
    myCircle.calculateCircumference();  
    return 0;  
}
```

6- Create a program with a class BankAccount that has private members accountNumber, accountHolder, and balance. Implement public methods setAccountDetails to set the account details and displayAccountInfo to display account information.

Output

```
Account Number: 12345  
Account Holder: John Doe  
Balance: $1000
```

Solution

```
// www.gammal.tech

#include<iostream>
#include<string>
using namespace std;

class BankAccount {
private:
    int accountNumber;
    string accountHolder;
    double balance;

public:
    void setAccountDetails(int accNum, string accHolder, double bal) {
        accountNumber = accNum;
        accountHolder = accHolder;
        balance = bal;
    }

    void displayAccountInfo() {
        cout << "Account Number: " << accountNumber << endl;
        cout << "Account Holder: " << accountHolder << endl;
        cout << "Balance: $" << balance << endl;
    }
};

int main() {
    BankAccount myAccount;
    myAccount.setAccountDetails(12345, "John Doe", 1000.0);
    myAccount.displayAccountInfo();
    return 0;
}
```

7- Extend the previous program to add a public method deposit to deposit money into the account and update the balance.

تمديد البرنامج السابق لإضافة طريقة إيداع عامة لإيداع الأموال في الحساب وتحديث الرصيد.

Output

```
$500 deposited successfully.
Account Number: 12345
Account Holder: John Doe
Balance: $1500
```

Solution

```
// www.gammal.tech

#include<iostream>
#include<string>
using namespace std;

class BankAccount {
private:
    int accountNumber;
    string accountHolder;
    double balance;

public:
    void setAccountDetails(int accNum, string accHolder, double bal) {
        accountNumber = accNum;
        accountHolder = accHolder;
        balance = bal;
    }

    void deposit(double amount) {
        balance += amount;
        cout << "$" << amount << " deposited successfully." << endl;
    }

    void displayAccountInfo() {
        cout << "Account Number: " << accountNumber << endl;
        cout << "Account Holder: " << accountHolder << endl;
        cout << "Balance: $" << balance << endl;
    }
};

int main() {
    BankAccount myAccount;
    myAccount.setAccountDetails(12345, "John Doe", 1000.0);
    myAccount.deposit(500.0);
    myAccount.displayAccountInfo();
    return 0;
}
```

8- Create a program with a class Book that has private members title, author, and price. Implement public methods setBookDetails to set book details and displayBookInfo to display book information.

Output

```
Title: The Catcher in the Rye
Author: J.D. Salinger
Price: $12.99
```

Solution

```
// www.gammal.tech

#include<iostream>
#include<string>
using namespace std;

class Book {
private:
    string title;
    string author;
    double price;

public:
    void setBookDetails(string t, string a, double p) {
        title = t;
        author = a;
        price = p;
    }

    void displayBookInfo() {
        cout << "Title: " << title << endl;
        cout << "Author: " << author << endl;
        cout << "Price: $" << price << endl;
    }
};

int main() {
    Book myBook;
    myBook.setBookDetails("The Catcher in the Rye", "J.D. Salinger", 12.99);
    myBook.displayBookInfo();
    return 0;
}
```

9- Extend the previous program to add a public method discount that applies a 10% discount to the book price and updates the price.

تمديد البرنامج السابق لإضافة خصم الطريقة العامة الذي يطبق خصم 10% على سعر الكتاب ويقوم بتحديث السعر.

Output

```
10% Discount Applied. New Price: $11.691
Title: The Catcher in the Rye
Author: J.D. Salinger
Price: $12.99
```


Solution

```
// www.gammal.tech

#include<iostream>
#include<string>
using namespace std;

class Book {
private:
    string title;
    string author;
    double price;

public:
    void setBookDetails(string t, string a, double p) {
        title = t;
        author = a;
        price = p;
    }

    void discount() {
        double discountedPrice = price - (0.10 * price);
        cout << "10% Discount Applied. New Price: $" << discountedPrice << endl;
    }

    void displayBookInfo() {
        cout << "Title: " << title << endl;
        cout << "Author: " << author << endl;
        cout << "Price: $" << price << endl;
    }
};

int main() {
    Book myBook;
    myBook.setBookDetails("The Catcher in the Rye", "J.D. Salinger", 12.99);
    myBook.discount();
    myBook.displayBookInfo();
    return 0;
}
```


10- Create a program that defines a class Person with private members name, age, and address. Implement public methods setDetails to set person details and displayInfo to display the person's information.

Output

```
Name: John Doe
Age: 25
Address: 123 Main St
```

Solution

```


// www.gammal.tech

#include<iostream>
#include<string>
using namespace std;

class Person {
private:
    string name;
    int age;
    string address;

public:
    void setDetails(string n, int a, string addr) {
        name = n;
        age = a;
        address = addr;
    }

    void displayInfo() {
        cout << "Name: " << name << endl;
        cout << "Age: " << age << endl;
        cout << "Address: " << address << endl;
    }
};

int main() {
    Person myPerson;
    myPerson.setDetails("John Doe", 25, "123 Main St");
    myPerson.displayInfo();
    return 0;
}
```
