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JAVA LAB-3

ABSTRACT CLASS

1.Create an abstract class named Book. Include a String field for the book's title and a double field for the book's price. Within the class, include a constructor that requires the book title, and add two get methods—one that returns the title and one that returns the price. Include an abstract method named setPrice(). Create two child classes of Book: Fiction and NonFiction. Each must include a setPrice() method that sets the price for all Fiction Books to $24.99 and for all NonFiction Books to $37.99. Write a constructor for each subclass, and include a call to setPrice() within each. Write an application demonstrating that you can create both a Fiction and a NonFiction Book, and display their fields. Save the files as Book.java,Fiction.java, NonFiction.java, and UseBook.java.

Book.java

```
package Book;
import java.util.Scanner;

public abstract class Book {
        public double price;
        public String title;
        Book(){
            Scanner sc = new Scanner(System.in);
            System.out.println("Enter book title:");
            title = sc.nextLine();
        }
        public String getTitle(){
        return title;
        }
        public double getPrice(){
            return price;
        }
        public abstract double setPrice();
}
```

Fiction.java

```
package Book;
import java.util.Scanner;

public class Fiction extends Book{
    public double getNum() {
        Scanner sc = new Scanner(System.in);
        double num;
        System.out.println("Enter how many Fiction books you want:");
        num = sc.nextDouble();
        return num;
    }
    public double setPrice(){
        price = getNum() * 24.99;
        return price;
    }
}
```

NonFiction.java

```
package Book;
import java.util.Scanner;

public class NonFiction extends Book {
    public double getNum() {
        Scanner sc = new Scanner(System.in);
        double num;
        System.out.println("Enter how many Non-Fiction books you want:");
        num = sc.nextDouble();
        return num;
    }
    public double setPrice(){
        price = getNum() * 37.99;
        return price;
    }
}
```

UseBook.java

```
package Book;

public class UseBook {
    public static void main(String args[]){
        Book obj = new Fiction();
        System.out.println("The title of the book is:" + obj.getTitle());
        obj.setPrice();
        System.out.println("The price is:" + obj.getPrice());
        Book obj1 = new NonFiction();
        System.out.println("The title of the non fiction book is:" +
obj1.getTitle());
        obj1.setPrice();
        System.out.println("The price is:" + obj1.getPrice());

    }
}
```

```
Enter book title:
Harry Potter
The title of the book is:Harry Potter
Enter how many Fiction books you want:
3
The price is:74.97
Enter book title:
Mike Meyers Security+
The title of the non fiction book is:Mike Meyers Security+
Enter how many Non-Fiction books you want:
3
The price is:113.97

Process finished with exit code 0
```

2.The Talk-A-Lot Cell Phone Company provides phone services for its customers. Create an abstract class named PhoneCall that includes a String field for a phone number and a double field for the price of the call. Also include a constructor that requires a phone number parameter and that sets the price to 0.0. Include a set method for the price. Also include three abstract get methods—one that returns the phone number, another that returns the price of the call, and a third that displays information about the call. Create two child classes of PhoneCall: IncomingPhoneCall and OutgoingPhoneCall. The IncomingPhoneCall constructor passes its phone number parameter to its parent's constructor and sets the price of the call to 0.02. The method that displays the phone call information displays the phone number, the rate, and the price of the call (which is the same as the rate). The OutgoingPhoneCall class includes an additional field that holds the time of the call in minutes. The constructor requires both a phone number and the time. The price is 0.04 per minute, and the display method shows the details of the call, including the phone number, the rate per minute, the number of minutes, and the total price. Write an application that demonstrates you can instantiate and display both IncomingPhoneCall and OutgoingPhoneCall objects. Save the files as PhoneCall.java, IncomingPhoneCall.java,OutgoingPhoneCall.java, and DemoPhoneCalls.java.

PhoneCall.java

```java
package Phone;
import java.util.Scanner;

public abstract class PhoneCall {
        public String number;
        public double price;
        PhoneCall(String num){
                 number = num;
                 setprice();
        }
        public void setprice(){
                price = 0.0;
        }
        public abstract String getNumber();
        public abstract double getPrice();
        public abstract void display();
}
```

IncomingPhoneCall.java

```java
package Phone;
import java.util.Scanner;

public class IncomingPhoneCall extends PhoneCall {

    IncomingPhoneCall(String number) {
        super(number);
        price = 0.2;
    }

    public String getNumber(){
                return number;
            }
            public double getPrice(){
                return price;
            }
            public void display(){
                System.out.println("Your phone number is:" + getNumber());
                System.out.println("The rate of the call is 0.2");
                System.out.println("The price of Incoming Call is:" +
getPrice());

            }

}
```

OutgoingPhoneCall.java

```
package Phone;
import java.util.Scanner;

public class OutgoingPhoneCall extends PhoneCall {
    OutgoingPhoneCall(String number, int time){
        super(number);
        price = time * 0.04;
    }
    public String getNumber(){
        return number;

    }
    public double getPrice(){

        return price;
    }
    public void display(){
        System.out.println("Your phone number is: "+ getNumber());
        System.out.println("The rate of the call is 0.04 per minute");
        System.out.println("Your price is: " + getPrice());

    }
}
```

DemoPhoneCalls.java

```
package Phone;
import java.util.Scanner;

public class DemoPhoneCalls {
    public static void main(String args[]) {
        Scanner sc = new Scanner(System.in);
        String num, ques;
        System.out.println("Enter your phone number:");
        num = sc.nextLine();

        System.out.println("Incoming or Outgoing call?");
        ques = sc.nextLine();
        if (ques.equals("Incoming")) {
            PhoneCall Obj = new IncomingPhoneCall(num);
            Obj.display();
        } else if (ques.equals("Outgoing")) {
            System.out.println("Enter the time you're gonna be on this
outgoing call in minutes:");
            int time = sc.nextInt();
            PhoneCall Obj = new OutgoingPhoneCall(num,time);
            Obj.display();
        }

        }
    }
```

```
Enter your phone number:
9476778771
Incoming or Outgoing call?
Incoming
Your phone number is:9476778771
The rate of the call is 0.2
The price of Incoming Call is:0.2

Process finished with exit code 0
```

```
Enter your phone number:
1143562345
Incoming or Outgoing call?
Outgoing
Enter the time you're gonna be on this outgoing call in minutes:
11
Your phone number is: 1143562345
The rate of the call is 0.04 per minute
Your price is: 0.44

Process finished with exit code 0
```

3.Create an abstract NewspaperSubscription class with fields for the subscriber name, address, and rate. Include get and set methods for the name field and get methods for the address and subscription rate; the setAddress() method is abstract. Create two subclasses named PhysicalNewspaperSubscription and OnlineNewspaperSubscription. The parameter for the setAddress() method of the PhysicalNewspaperSubscription class must contain at least one digit; otherwise, an error message is displayed and the subscription rate is set to 0. If the address is valid, the subscription rate is assigned $15. The parameter for the setAddress() method of the OnlineNewspaperSubscription class must contain an at sign (@) or an error message is displayed. If the address is valid, the subscription rate is assigned $9. Finally, write an application that declares several objects of both subscription subtypes and displays their data fields. Save the files as NewspaperSubscription.java, PhysicalNewspaperSubscription.java, OnlineNewspaperSubscription. java, and DemoSubscriptions.java.

NewspaperSubscription.java

```java
package Newspaper;
import java.util.Scanner;
public abstract class NewspaperSubscription {
    String subname;
    String add;
    double subrate;
    void getSubname()
    {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter subscriber name:");
        subname = in.nextLine();
    }
    void getAddress()
    {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter address:");
        add = in.nextLine();
    }
    void getSubrate()
    {
        Scanner in = new Scanner(System.in);
        System.out.println("Enter subscription rate:");
        subrate = in.nextDouble();
    }
    abstract double setAddress();
}
```

PhysicalNewspaperSubscription.java

```java
package Newspaper;
public class PhysicalNewspaperSubscription extends NewspaperSubscription{
    double setAddress() {
        int i;
        char[] add1 = add.toCharArray();
        for (char c : add1) {
            if (Character.isDigit(c)) {
                subrate = 15.0;
                //System.out.println(c);
            }
            else
                subrate = 0.0;
        }
        if (subrate==0.0)
            System.out.println("Invalid address");
        return subrate;
    }
}
```

OnlineNewspaperSubscription.java

```
package Newspaper;
public class OnlineNewspaperSubscription extends NewspaperSubscription {
    double setAddress() {
        int i;
        if (add.contains("@"))
            subrate = 9.0;
        else
            subrate = 0.0;
        if (subrate == 0.0)
            System.out.println("Invalid address");
        return subrate;
    }
}
```

DemoSubscriptions.java

```
package Newspaper;
public class DemoSubscriptions {
    public static void main(String[] args) {
        PhysicalNewspaperSubscription p = new
PhysicalNewspaperSubscription();
        p.getSubname();
        p.getAddress();
        p.getSubrate();
        System.out.println("Subscription rate:$" + p.setAddress());
        OnlineNewspaperSubscription o = new OnlineNewspaperSubscription();
        o.getSubname();
        o.getAddress();
        o.getSubrate();
        System.out.println("Subscription rate:$" + o.setAddress());

    }
}
```

```
Enter subscriber name:
Harry
Enter address:
street78
Enter subscription rate:
5
Subscription rate:$15.0
Enter subscriber name:
Vagabond
Enter address:
root@kali
Enter subscription rate:
10
Subscription rate:$9.0

Process finished with exit code 0
```