Quellcode Serie 06 - Programmieren 1

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Aufgabe 1)

Book.java

```
package auf1;
/*
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Jan Ellenberger (21-103-643)
*/
//*************************************************
//Datei fuer Serie 6, Teilaufgabe 1
//*************************************************


import java.util.Date;
import java.util.Scanner;
import java.text.*;

public class Book
{
    private int id;
    private String title;
    private String author;
    private Date dateOfPublication;

    public static final String DATE_FORMAT = "dd.MM.yyyy";

    //--- constructors ---
    public Book(int idName, String titleName, String authorName, Date dateOfPu
b){
        id = idName;
        title = titleName;
        author = authorName;
        dateOfPublication = dateOfPub;
    }


    /** Returns a String representation of the book */
    public String toString()
    {
        String result = Integer.toString(id) + ", " + title + ", " + author +
", " + dateToString(dateOfPublication);
        return result;
```

```
    }


    /** Converts the Date object d into a String object */
    public static String dateToString( Date d )
    {
        SimpleDateFormat fmt = new SimpleDateFormat( DATE_FORMAT );
        return fmt.format( d );
    }

    /** Converts the String object s into a Date object */
    public static Date stringToDate( String s )
    {
        Date r = null;
        try {
            SimpleDateFormat fmt = new SimpleDateFormat( DATE_FORMAT );
            r = fmt.parse( s );
        } catch ( ParseException e ){
            System.err.println( e );
            System.exit(1);
        }
        return r;
    }
}
```

Order.java

```
package auf1;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

import java.util.ArrayList;


public class Order {
    // counter for the id of a new order
    public static int idCounter = 0;

    private final int id;
    private String customerName;
    private String customerAddress;
    private ArrayList<Book> books = new ArrayList<>();
```

```
    //increase order id with new order
    public Order() {
        id = Order.idCounter += 1;
    }

    // add a book to the order
    public void addBook(Book book) {
        this.books.add(book);
    }

    //set name of Customer for order
    public void setCustomerName(String customerName) {
        this.customerName = customerName;
    }

    //set the customers adress of an order
    public void setCustomerAddress(String customerAddress) {
        this.customerAddress = customerAddress;
    }


    //toString method to represent all books from one order with a string
    public String toString() {
        String stringRepresentation = "Order id: " + id +
                " Customer: " + customerName + ", " + customerAddress + '\n';

        for (Book book : this.books) {
            stringRepresentation += book.toString() + "\n";
        }

        return stringRepresentation;
    }
}
```

Test.java

```
package auf1;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

import java.text.ParseException;
import java.text.SimpleDateFormat;
import java.util.Date;
```

```java
//************************************************
//Datei fuer Serie 6, Teilaufgabe 1
//************************************************

public class Test
{
    public static void main(String args[]) throws ParseException
    {
        SimpleDateFormat fmt = new SimpleDateFormat(Book.DATE_FORMAT);

        // Creating Book-objects...
        Book b1 = new Book(1, "Homo Faber", "Max Frisch", fmt.parse("01.01.195
7"));
        Book b2 = new Book(2, "Harry Potter", "J.K. Rowling", fmt.parse("25.7.
2000"));
        Book b3 = new Book(3, "Krieg und Frieden", "Leo Tolstoi", fmt.parse("2
4.01.1867"));
        Book b4 = new Book(4, "Freedom", "Jonathan Franzen", fmt.parse("08.06.
2010"));
        Book b5 = new Book(5, "Goedel, Escher, Bach", "Douglas Hofstadter", fm
t.parse("05.11.1979"));

        // Creating two orders containing theses books...

        Order order = new Order();
        order.setCustomerName("Sophie Muster");
        order.setCustomerAddress("Mittelstrasse 10, 3011 Bern");
        order.addBook(b1);
        order.addBook(b2);
        order.addBook(b3);
        order.addBook(b4);
        order.addBook(b4);
        order.addBook(b5);
        System.out.println(order);

        System.out.print("\n");

        Order order2 = new Order();
        order2.setCustomerName("Woody Allen");
        order2.setCustomerAddress("5th Avenue 7, 10001 New York");
        order2.addBook(b5);
        System.out.println(order2);
    }
}
```

Aufgabe 2.)

Book.java

```java
package auf2;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/
//*************************************************
//Datei fuer Serie 6, Teilaufgabe 2
//*************************************************


public class Book implements IArticle
{
    private int id;
    private String title;
    private String author;
    private int year;
    private int price;

    //Konstruktor für buch
    public Book( int id, String title, String author, int year, int price )
    {
        this.id = id;
        this.title = title;
        this.author = author;
        this.year = year;
        this.price = price;
    }
    //**getter */
    public String getDescription()
    {
        return id + " (Book) " + title + ", by " + author +
            ", " + year + ", " + price + " CHF";
    }

    public int getPrice() {
        return price;
    }

    public int getId() {
        return id;
    }
    //*getter */
}
```

CD.java

```java
package auf2;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

public class CD implements IArticle {
    private int id;
    private String title;
    private String interpret;
    private int year;
    private int price;

    // Konstruktor für CD
    public CD(int id, String title, String interpret, int year, int price) {
        this.id = id;
        this.title = title;
        this.interpret = interpret;
        this.year = year;
        this.price = price;
    }

    public int getId() {
        return id;
    }

    public int getPrice() {
        return price;
    }

    public String getDescription() {
        return id + " (CD) " + title + ", by " + interpret +
                ", " + year + ", " + price + " CHF";
    }
}
```

DVD.java

```java
package auf2;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
```

```
Jan Ellenberger (21-103-643)
*/

//Konstruktor für DVD
public class DVD implements IArticle {
    private int id;
    private String title;
    private int year;
    private int price;

    public DVD(int id, String title, int year, int price) {
        this.id = id;
        this.title = title;
        this.year = year;
        this.price = price;
    }

    public int getId() {
        return id;
    }

    public int getPrice() {
        return price;
    }

    public String getDescription() {
        return id + " (DVD) " + title +
                ", " + year + ", " + price + " CHF";
    }
}
```

IArticle.java

```
package auf2;

/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/
public interface IArticle {
    int getId();

    int getPrice();

    String getDescription();
```

```
}
```

Order.java

```java
package auf2;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

import java.util.ArrayList;

public class Order {

    public static int idCounter = 0;

    private final int id;
    private String customerName;
    private String customerAddress;
    private ArrayList<IArticle> articles = new ArrayList<>();

    // counter for the id of a new order
    public Order() {
        id = Order.idCounter += 1;
    }

    // calculate Price of all ordered articles together
    public int getTotalPrice() {
        int total = 0;
        for (IArticle article : articles) {
            total += article.getPrice();
        }
        return total;
    }

    public Iterable<IArticle> getOrderedArticles() {
        return this.articles;
    }

    // add article to order
    public void add(IArticle article) {
        this.articles.add(article);
    }
```

```
    // ** setter and getter*/
    public void setCustomerName(String customerName) {
        this.customerName = customerName;
    }

    public void setCustomerAddress(String customerAddress) {
        this.customerAddress = customerAddress;
    }

    public int getId() {
        return id;
    }

    public String getCustomerName() {
        return customerName;
    }

    public String getCustomerAddress() {
        return customerAddress;
    }
    // **setter and getter */

    public String toString() {
        return "Order{" +
                "id=" + id +
                ", customerName='" + customerName + '\'' +
                ", customerAddress='" + customerAddress + '\'' +
                ", books=" + articles.toString() +
                '}';
    }
```

Store.java

```
package auf2;

/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

import java.util.Scanner;
import java.util.*;


//************************************************
//Datei fuer Serie 6, Teilaufgabe 2
//************************************************
```

```
public class Store
{
    private ArrayList<IArticle> articles = new ArrayList<IArticle>();
    private ArrayList<Order> orders = new ArrayList<Order>();

    /** starts the menu */
    public void interactWithUser()
    {
        String answer = "";
        while ( !answer.equals( "9" ) ) {
            System.out.println( " ==========================================
================" );
            System.out.println( "|
                 |" );
            System.out.println( "|  1. Create a new order     2. Show all regi
stered articles  |" );
            System.out.println( "|  3. Show all orders        9. Exit
                 |" );
            System.out.println( "|
                 |" );
            System.out.println( " ==========================================
================" );
            Scanner scn = new Scanner( System.in );
            System.out.print( "\nWhat do you want to do? " );
            answer = scn.nextLine();
            if ( answer.equals( "1" ) ) {
                this.newOrder();
            } else if ( answer.equals( "2" ) ) {
                this.listArticles();
                System.out.println( "" );
            } else if ( answer.equals( "3" ) ) {
                this.listOrders();
            }
        }
    }

    /** Add a new article to the store */
    public void addArticle( IArticle a )
    {
        articles.add( a );
    }

    /** Let's the user compose a new order */
    private void newOrder()
    {
        Order order = new Order();
        listArticles();
        Scanner scn = new Scanner( System.in );
```

```
        System.out.print( "\nEnter id of ordered article (press x when done):
" );
        String input = scn.nextLine();
        while ( !input.equalsIgnoreCase( "x" ) ) {
            int id = Integer.parseInt( input );
            if ( articleExists( id ) ) {
                // if it exists, then add it to the order
                for ( IArticle a : this.articles ) {
                    if ( a.getId() == id ) {
                        order.add( a );
                        System.out.println( "Successfully added: " + a.getDesc
ription() );
                    }
                }
            } else {
                System.out.println( "A medium with this id does not exist!" );
            }
            System.out.print( "Enter id of ordered article (press x when done)
: " );
            input = scn.nextLine();
        }
        System.out.print( "Enter the customer's name: " );
        order.setCustomerName( scn.nextLine() );
        System.out.print( "Enter the customer's address: " );
        order.setCustomerAddress( scn.nextLine() );
        this.orders.add( order );
    }

    /** checks if an article with the given id exists */
    private boolean articleExists( int id )
    {
        for ( IArticle a : this.articles ) {
            if ( a.getId() == id )
                return true;
        }
        return false;
    }

    /** Output all registered media on the screen */
    private void listArticles()
    {
        System.out.println( "" );
        for ( IArticle a : this.articles ) {
            System.out.println( a.getDescription() );
        }
    }

    /** Output all orders on the screen */
    private void listOrders()
    {
```

```
        for ( Order o : this.orders ) {
            String order = "\nOrder No. " + o.getId() + " for: " + o.getCustom
erName() + ", "
                           + o.getCustomerAddress() + "\n";
            for ( IArticle a : o.getOrderedArticles() ) {
                order += "* " + a.getDescription() + "\n";
            }
            order += "-----------------------------------------------------\n";
            order += "Total price: " + o.getTotalPrice() + " CHF\n";
            order += "=====================================================\n";
            System.out.println( order );
        }
    }


    /** Registers some objects and starts the program */
    public static void main( String[] args ) throws java.text.ParseException
    {
        Store store = new Store();
        store.addArticle( new Book( 1, "Die Blechtrommel", "Günter Grass", 195
9, 29 ) );
        store.addArticle( new Book( 2, "Andorra", "Max Frisch", 1961, 39 ) );
        store.addArticle( new Book( 3, "L'Etranger", "Albert Camus", 1942, 25
) );
        store.addArticle( new DVD( 4, "Casablanca", 1942, 29 ) );
        store.addArticle( new DVD( 5, "Into the wild", 2007, 38 ) );
        store.addArticle( new CD( 6, "Nevermind", "Nirvana", 1991, 19 ) );
        store.addArticle( new CD( 7, "Thriller", "Michael Jackson", 1982, 18 )
 );
        store.addArticle( new CD( 8, "...Baby One More Time", "Britney Spears"
, 1999, 50 ) );

        store.interactWithUser();
    }
}
```

Aufgabe 3.)

Furniture.java

```java
package auf3;
/*
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Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

public class Furniture {
    public Material material;
    protected double pricePerHour;
    protected double workedHours;

    public Furniture(Material material, double pricePerHour, double workedHour
s) {
        this.material = material;
        this.pricePerHour = pricePerHour;
        this.workedHours = workedHours;
    }

    // calculate Effort with workedHours times the price per hour
    public double calculateEffort() {
        return workedHours * pricePerHour;
    }
}
```

FurnitureTest.java

```java
package auf3;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

import java.util.ArrayList;


//*************************************************
//Datei fuer Serie 6, Teilaufgabe 3
```

```java
//************************************************


public class FurnitureTest
{
    /**
     * creates four different tables with different materials and tests the
     * different methods
     *
     */
   public static void main (String[] args) {

       //Table(Material, pricePerHour, workedHours, area)
       ArrayList<Table> tables = new ArrayList<>();
       tables.add(new Table(Material.ESCHE, 15, 100, 5));
       tables.add(new Table(Material.ESCHE, 20, 200, 10));
       tables.add(new Table(Material.EICHE, 35, 340, 7.5));
       tables.add(new Table(Material.BUCHE, 25, 200, 9));

       for (Table table : tables) {
           StringBuffer message = new StringBuffer();
           message.append("Tisch " + (tables.indexOf(table) + 1));
           message.append(" besteht aus " + table.material.name());
           message.append(". Der Preis für den Aufwand ist " + table.calculate
Effort());
           message.append(" und somit der gesamte Preis gleich " + table.total
Price());
           System.out.println(message.toString());
       }
   }
}
```

Material.java

```java
package auf3;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/
//enum with names for the materials and each price for the
//different materials
public enum Material {
    EICHE("Eiche", 10),
    BUCHE("Buche", 20),
    ESCHE("Esche", 30);
```

```
    public String name;
    public double materialCost;

    Material(String name, double materialCost) {
        this.name = name;
        this.materialCost = materialCost;
    }
}
```

Table.java

```
package auf3;
/*
Jara Zihlmann(20-117-032)
Vithusan Ramalingam (21-105-515)
Jan Ellenberger (21-103-643)
*/

public class Table extends Furniture{

    private double area;

    //constructor for a table
    public Table(Material material, double pricePerHour, double workedHours, d
ouble area) {
        super(material, pricePerHour, workedHours);
        this.area = area;
    }

    // calculate the total price for a table
    public double totalPrice() {
        return super.calculateEffort() + area * material.materialCost;
    }
```