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| Subject | OOP |
| Assignment | Lab Assignment 02,03 |
| Date | Sept 20th , 2024 |

**Submitted to:**

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| --- | --- |
| Moderator | Ms, Sajida Kalsoom |

**Lab Task 01:**

class Address {

    private String street;

    private String houseNumber;

    private String city;

    private String code;

    public Address(String street, String houseNumber, String city, String code) {

        this.street = street;

        this.houseNumber = houseNumber;

        this.city = city;

        this.code = code;

    }

    public String getStreet() {

        return street;

    }

    public void setStreet(String street) {

        this.street = street;

    }

    public String getHouseNumber() {

        return houseNumber;

    }

    public void setHouseNumber(String houseNumber) {

        this.houseNumber = houseNumber;

    }

    public String getCity() {

        return city;

    }

    public void setCity(String city) {

        this.city = city;

    }

    public String getCode() {

        return code;

    }

    public void setCode(String code) {

        this.code = code;

    }

    public String getAddressDetails() {

        return "Street: " + street + ", House#: " + houseNumber + ", City: " + city + ", Code: " + code;

    }

}

class Person {

    private String name;

    private Address address;

    public Person(String name, Address address) {

        this.name = name;

        this.address = address;

    }

    public String getName() {

        return name;

    }

    public void setName(String name) {

        this.name = name;

    }

    public Address getAddress() {

        return address;

    }

    public void setAddress(Address address) {

        this.address = address;

    }

    public void displayPersonInfo() {

        System.out.println("Name: " + name);

        System.out.println("Address: " + address.getAddressDetails());

    }

}

public class Main {

    public static void main(String[] args) {

        Address address = new Address("Main St", "123", "New York", "10001");

        Person person = new Person("John Doe", address);

        person.displayPersonInfo();

        address.setStreet("Broadway");

        address.setHouseNumber("456");

        person.setAddress(address);

        System.out.println("\nUpdated Info:");

        person.displayPersonInfo();

    }}

**Lab Task 02:**

class Address {

    private String street;

    private String houseNumber;

    private String city;

    private String code;

    public Address(String street, String houseNumber, String city, String code) {

        this.street = street;

        this.houseNumber = houseNumber;

        this.city = city;

        this.code = code;

    }

    public String getStreet() {

        return street;

    }

    public void setStreet(String street) {

        this.street = street;

    }

    public String getHouseNumber() {

        return houseNumber;

    }

    public void setHouseNumber(String houseNumber) {

        this.houseNumber = houseNumber;

    }

    public String getCity() {

        return city;

    }

    public void setCity(String city) {

        this.city = city;

    }

    public String getCode() {

        return code;

    }

    public void setCode(String code) {

        this.code = code;

    }

    public String getAddressDetails() {

        return "Street: " + street + ", House#: " + houseNumber + ", City: " + city + ", Code: " + code;

    }

}

class Person {

    private String name;

    private Address address;

    public Person(String name, Address address) {

        this.name = name;

        this.address = address;

    }

    public String getName() {

        return name;

    }

    public void setName(String name) {

        this.name = name;

    }

    public Address getAddress() {

        return address;

    }

    public void setAddress(Address address) {

        this.address = address;

    }

    public void displayPersonInfo() {

        System.out.println("Name: " + name);

        System.out.println("Address: " + address.getAddressDetails());

    }

}

class Book {

    private String bookName;

    private String publisher;

    private Person author;

    public Book(String bookName, String publisher, Person author) {

        this.bookName = bookName;

        this.publisher = publisher;

        this.author = author;

    }

    public String getBookName() {

        return bookName;

    }

    public void setBookName(String bookName) {

        this.bookName = bookName;

    }

    public String getPublisher() {

        return publisher;

    }

    public void setPublisher(String publisher) {

        this.publisher = publisher;

    }

    public Person getAuthor() {

        return author;

    }

    public void setAuthor(Person author) {

        this.author = author;

    }

    public void displayBookInfo() {

        System.out.println("Book Name: " + bookName);

        System.out.println("Publisher: " + publisher);

        System.out.println("Author: " + author.getName());

        System.out.println("Author's Address: " + author.getAddress().getAddressDetails());

    }

}

public class Main {

    public static void main(String[] args) {

        Address authorAddress = new Address("Maple St", "789", "Los Angeles", "90001");

        Person author = new Person("Jane Austen", authorAddress);

        Book book = new Book("Pride and Prejudice", "Penguin Books", author);

        System.out.println("Original Book Info:");

        book.displayBookInfo();

        Address newAuthorAddress = new Address("Elm St", "101", "San Francisco", "94101");

        author.setAddress(newAuthorAddress);

        System.out.println("\nUpdated Book Info:");

        book.displayBookInfo();

    }

}

**Lab Task 03:**

class Point {

private double xCord;

private double yCord;

public Point(double xCord, double yCord) {

this.xCord = xCord;

this.yCord = yCord;

}

public double getXCord() {

return xCord;

}

public void setXCord(double xCord) {

this.xCord = xCord;

}

public double getYCord() {

return yCord;

}

public void setYCord(double yCord) {

this.yCord = yCord;

}

public void display() {

System.out.println("Point (" + xCord + ", " + yCord + ")");

}

}

class Line {

private Point startPoint;

private Point endPoint;

public Line(Point startPoint, Point endPoint) {

this.startPoint = startPoint;

this.endPoint = endPoint;

}

public double getLength() {

double xDiff = endPoint.getXCord() - startPoint.getXCord();

double yDiff = endPoint.getYCord() - startPoint.getYCord();

return Math.sqrt((xDiff \* xDiff) + (yDiff \* yDiff));

}

public void displayLineLength() {

System.out.println("Length of the line: " + getLength());

}

}

public class Main {

public static void main(String[] args) {

Point p1 = new Point(2, 3);

Point p2 = new Point(5, 7);

Line line1 = new Line(p1, p2);

line1.displayLineLength();

Point p3 = new Point(1, 1);

Point p4 = new Point(4, 5);

Line line2 = new Line(p3, p4);

line2.displayLineLength();

}

}

**Lab Task 04:**

class Pizza {

private String size;

private int cheeseToppings;

private int pepperoniToppings;

private int hamToppings;

public Pizza(String size, int cheeseToppings, int pepperoniToppings, int hamToppings) {

this.size = size.toLowerCase();

this.cheeseToppings = cheeseToppings;

this.pepperoniToppings = pepperoniToppings;

this.hamToppings = hamToppings;

}

public String getSize() {

return size;

}

public void setSize(String size) {

this.size = size.toLowerCase();

}

public int getCheeseToppings() {

return cheeseToppings;

}

public void setCheeseToppings(int cheeseToppings) {

this.cheeseToppings = cheeseToppings;

}

public int getPepperoniToppings() {

return pepperoniToppings;

}

public void setPepperoniToppings(int pepperoniToppings) {

this.pepperoniToppings = pepperoniToppings;

}

public int getHamToppings() {

return hamToppings;

}

public void setHamToppings(int hamToppings) {

this.hamToppings = hamToppings;

}

public double calcCost() {

int baseCost = 0;

if (size.equals("small")) {

baseCost = 10;

} else if (size.equals("medium")) {

baseCost = 12;

} else if (size.equals("large")) {

baseCost = 14;

}

return baseCost + 2 \* (cheeseToppings + pepperoniToppings + hamToppings);

}

public String getDescription() {

return "Size: " + size + ", Cheese Toppings: " + cheeseToppings +

", Pepperoni Toppings: " + pepperoniToppings + ", Ham Toppings: " + hamToppings +

", Cost: $" + calcCost();

}

}

class PizzaOrder {

private Pizza pizza1;

private Pizza pizza2;

private Pizza pizza3;

public void setPizza1(Pizza pizza) {

this.pizza1 = pizza;

}

public void setPizza2(Pizza pizza) {

this.pizza2 = pizza;

}

public void setPizza3(Pizza pizza) {

this.pizza3 = pizza;

}

public double calcTotal() {

double totalCost = 0;

if (pizza1 != null) totalCost += pizza1.calcCost();

if (pizza2 != null) totalCost += pizza2.calcCost();

if (pizza3 != null) totalCost += pizza3.calcCost();

return totalCost;

}

}

public class Main {

public static void main(String[] args) {

Pizza pizza1 = new Pizza("large", 1, 1, 2);

Pizza pizza2 = new Pizza("medium", 2, 2, 0);

System.out.println(pizza1.getDescription());

System.out.println(pizza2.getDescription());

PizzaOrder order = new PizzaOrder();

order.setPizza1(pizza1);

order.setPizza2(pizza2);

System.out.println("Total cost of the order: $" + order.calcTotal());

}

}