Object Oriented Programming
Lab Assignment 6

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Activity 1:

```
package LAB6;

class person {
    protected String name;
    protected String id;
    protected int phone;

    person() {
        name = " ";
        id = " ";
        phone = 0;
    }

    person(String name, String id, int phone) {
        this.name = name;
        this.id = id;
        this.phone = phone;
    }

    public String getName() {
        return name;
    }

    public void setName(String name) {
        this.name = name;
    }

    public String getId() {
        return id;
    }

    public void setId(String id) {
        this.id = id;
    }

    public int getPhone() {
        return phone;
    }

    public void setPhone(int phone) {
        this.phone = phone;
    }
```

```
    void display() {
        System.out.println("Name: " + name);
        System.out.println("ID: " + id);
        System.out.println("Phone: " + phone);
    }
}

class Student extends person {
    private String rollNo;
    private int marks;

    Student() {
        super();
        rollNo = " ";
        marks = 0;
    }

    Student(String name, String id, int phone, String rollNo, int marks) {
        super(name, id, phone);
        this.rollNo = rollNo;
        this.marks = marks;
    }

    @Override
    void display() {
        super.display();
        System.out.println("Roll No: " + rollNo);
        System.out.println("Marks: " + marks);
    }

    public String getRollNo() {
        return rollNo;
    }

    public void setRollNo(String rollNo) {
        this.rollNo = rollNo;
    }

    public int getMarks() {
        return marks;
    }

    public void setMarks(int marks) {
        this.marks = marks;
```

```
    }

}

class Runner {
    public static void main(String[] args) {
        Student s1 = new Student("Hasaan Ahmad", "Sp22-bse-017", 123456789, "17",
100);
        s1.display();
    }

}
```

Output:

```
Name: Hasaan Ahmad
ID: SP22-bse-017
Phone: 34324234
Roll No: 017
Marks: 100
```

Activity2:

```
package LAB6;

class Employee {
    protected String name;
    protected String phone;
    protected String address;
    protected int allowance;

    public Employee(String name, String phone, String address, int allowance) {
        this.name = name;
        this.phone = phone;
        this.address = address;
        this.allowance = allowance;
    }
}

class Regular extends Employee {
    private int basicPay;

    public Regular(String name, String phone, String address, int allowance, int
basicPay) {
        super(name, phone, address, allowance);
```

```
        this.basicPay = basicPay;
    }

    public void Display() {
        System.out.println("Name: " + name + " Phone Number: " + phone
                + " Address: " + address + " Allowance: " + allowance + " Basic
Pay: "
                + basicPay);
    }
}

class Adhoc extends Employee {
    private int numberOfWorkingDays;
    private int wage;

    public Adhoc(String name, String phone, String address,
            int allowance, int numberOfWorkingDays, int wage) {
        super(name, phone, address, allowance);
        this.numberOfWorkingDays = numberOfWorkingDays;
        this.wage = wage;
    }

    public void Display() {
        System.out.println("Name: " + name + " Phone Number: " + phone + "
Address: " + address + " Allowance: "
                + allowance + " Number Of Working Days: " + numberOfWorkingDays +
" Wage: " +
                wage);
    }
}

public class Runner2 {
    public static void main(String[] args) {

        Regular r = new Regular("John", "123456789", "Kathmandu", 1000, 50000);
        Adhoc a = new Adhoc("John", "123456789", "Kathmandu", 1000, 20, 1000);
        a.Display();
        r.Display();
    }
}
```

Output

```
les\Java\jdk-18.0.2\bin\java.exe' '-XX:+ShowCodeDetailsInExceptionMessages' '-cp' 'C:\Users\GOOD WILL ALWAYS\App
eStorage\f1606d44366f71687cb991058c4fea11\redhat.java\jdt_ws\jdt.ls-java-project\bin' 'LAB6.Runner2'
Name: John Phone Number: 123456789 Address: Kathmandu Allowance: 1000 Number Of Working Days: 20 Wage: 1000
Name: John Phone Number: 123456789 Address: Kathmandu Allowance: 1000 Basic Pay: 50000
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual\src\LAB6>
```

Graded Lab Task 1:

```java
package LAB6;
/*
The Person, Student, Employee, Faculty, and Staff classes)
Design a class named Person and its two subclasses named Student and Employee.
Design two more
classes; Faculty and Staff and extend them from Employee. The detail of classes
is as under:
A person has a name, address, phone number, and email address.
A student has a status (String)
An employee has an office, salary, and date hired. Use the Date class to create
an object for date hired.
A faculty member has office hours and a rank.
A staff member has a title.
Create display method in each class
 */

class Person {
    protected String name;
    protected String address;
    protected String phone;
    protected String email;

    public Person(String name, String address, String phone, String email) {
        this.name = name;
        this.address = address;
        this.phone = phone;
        this.email = email;
    }

    void display() {
        System.out.println("Name: " + name);
        System.out.println("Address: " + address);
        System.out.println("Phone: " + phone);
        System.out.println("Email: " + email);
    }
}

class Date {
    private int day;
```

```
    private int month;
    private int year;

    public Date(int day, int month, int year) {
        this.day = day;
        this.month = month;
        this.year = year;
    }

    public Date(String string) {
    }

    void display() {
        System.out.println("Date: " + day + "/" + month + "/" + year);
    }
}

class Student extends Person {
    private String status;

    public Student(String name, String address, String phone, String email,
String status) {
        super(name, address, phone, email);
        this.status = status;
    }

    void display() {
        super.display();
        System.out.println("Status: " + status);
    }
}

class Employee extends Person {
    private String office;
    private int salary;
    private Date dateHired;

    public Employee(String name, String address, String phone, String email,
String office, int salary,
            Date dateHired) {
        super(name, address, phone, email);
        this.office = office;
        this.salary = salary;
        this.dateHired = dateHired;
    }
```

```
    void display() {
        super.display();
        System.out.println("Office: " + office);
        System.out.println("Salary: " + salary);
        dateHired.display();
    }
}

class Faculty extends Employee {
    private String officeHours;
    private String rank;

    public Faculty(String name, String address, String phone, String email,
String office, int salary, Date dateHired,
            String officeHours, String rank) {
        super(name, address, phone, email, office, salary, dateHired);
        this.officeHours = officeHours;
        this.rank = rank;
    }

    void display() {
        super.display();
        System.out.println("Office Hours: " + officeHours);
        System.out.println("Rank: " + rank);
    }
}

class Staff extends Employee {
    private String title;

    public Staff(String name, String address, String phone, String email, String
office, int salary, Date dateHired,
            String title) {
        super(name, address, phone, email, office, salary, dateHired);
        this.title = title;
    }

}

public class GLT1 {
    public static void main(String[] args) {
        Person p = new Person("John", "123 Main St", "123-456-7890",
"johdoe@tempmail.com");
```

```
        Student s = new Student("John", "123 Main St", "123-456-7890",
"johstudent@tempmail.com", "Freshman");
        Employee e = new Employee("John", "123 Main St", "123-456-7890",
"johnemp@tempmail.com", "Office 1", 1000,
                new Date(3, 1, 2020));
        Faculty f = new Faculty("John", "123 Main St", "123-456-7890",
"johnfaculty@tempmail.com", "Office 1", 1000,
                new Date(4, 3, 2023), "9-5", "Professor");
        Staff st = new Staff("John", "123 Main St", "123-456-7890",
"johnthejanit@tempmail.com", "Office 1", 1000,
                new Date(28, 2, 2023), "Janitor");
        p.display();
        System.out.println();
        s.display();
        System.out.println();
        e.display();
        System.out.println();
        f.display();
        System.out.println();
        st.display();
    }
}
```

Output:

```
Name: John
Address: 123 Main St
Phone: 123-456-7890
Email: johdoe@tempmail.com

Name: John
Address: 123 Main St
Phone: 123-456-7890
Email: johstudent@tempmail.com
Status: Freshman
```

```
Name: John
Address: 123 Main St
Phone: 123-456-7890
Email: johnemp@tempmail.com
Office: Office 1
Salary: 1000
Date: 3/1/2020

Name: John
Address: 123 Main St
Phone: 123-456-7890
Email: johnfaculty@tempmail.com
Office: Office 1
Salary: 1000
Date: 4/3/2023
Office Hours: 9-5
Rank: Professor

Name: John
Address: 123 Main St
Phone: 123-456-7890
Email: johnthejanit@tempmail.com
Office: Office 1
Salary: 1000
Date: 28/2/2023
```

Graded Lab Task 2:

```
package LAB6;
/*
 Imagine a publishing company that markets both book and audio-cassette versions
of its works. Create a
class publication that stores the title and price of a publication. From this
class derive two classes:
i. book, which adds a page count and
ii. tape, which adds a playing time in minutes.
Each of these three classes should have set() and get() functions and a display()
function to display its
data. Write a main() program to test the book and tape class by creating
instances of them, asking the
user to fill in their data and then displaying the data with display().
 */
```

```java
class Publication {
    private String title;
    private double price;

    public Publication(String title, double price) {
        this.title = title;
        this.price = price;
    }

    public String getTitle() {
        return title;
    }

    public void setTitle(String title) {
        this.title = title;
    }

    public double getPrice() {
        return price;
    }

    public void setPrice(double price) {
        this.price = price;
    }

    void display() {
        System.out.println("Title: " + title);
        System.out.println("Price: " + price + " Rs.");
    }
}

class Book extends Publication {
    private int pageCount;

    public Book(String title, double price, int pageCount) {
        super(title, price);
        this.pageCount = pageCount;
    }

    public int getPageCount() {
        return pageCount;
    }

    public void setPageCount(int pageCount) {
        this.pageCount = pageCount;
```

```
    }

    @Override
    void display() {
        super.display();
        System.out.println("Page Count: " + pageCount + " pages");
    }
}

class Tape extends Publication {
    private int playTime;

    // Default constructor
    public Tape() {
        super("", 0);
        this.playTime = 0;
    }

    Tape(String title, double price, int playTime) {
        super(title, price);
        this.playTime = playTime;
    }

    public int getPlayTime() {
        return playTime;
    }

    public void setPlayTime(int playTime) {
        this.playTime = playTime;
    }

    @Override
    void display() {
        super.display();
        System.out.println("Play Time: " + playTime + " minutes");
    }
}

public class GLT2 {
    public static void main(String[] args) {
        // Taking inputs from user to fill in data
        System.out.println("Enter the title of the book:");
        String title = System.console().readLine();
        System.out.println("Enter the price of the book:");
        double price = Double.parseDouble(System.console().readLine());
```

```
        System.out.println("Enter the page count of the book:");
        int pageCount = Integer.parseInt(System.console().readLine());
        Book book = new Book(title, price, pageCount);
        System.out.println("Enter the details of the tape:");
        title = System.console().readLine();
        System.out.println("Enter the price of the tape:");
        price = Double.parseDouble(System.console().readLine());
        System.out.println("Enter the play time of the tape:");
        int playTime = Integer.parseInt(System.console().readLine());
        Tape tape = new Tape(title, price, playTime);
        // Displaying the data
        System.out.println("The details of the book are:");
        book.display();
        System.out.println("The details of the tape are:");
        tape.display();

    }

}
```

Output:

```
Enter the title of the book:
Ultimate guide to java
Enter the price of the book:
1500
Enter the page count of the book:
200
Enter the details of the tape:
Java Audio Book For OOP
Enter the price of the tape:
300
Enter the play time of the tape:
100
The details of the book are:
Title: Ultimate guide to java
Price: 1500.0 Rs.
Page Count: 200 pages
The details of the tape are:
Title: Java Audio Book For OOP
Price: 300.0 Rs.
Play Time: 100 minutes
```

Graded Lab Task 3:

```java
package LAB6;

/*
 Write a base class Computer that contains data members of wordsize(in bits),
memorysize (in megabytes),
storagesize (in megabytes) and speed (in megahertz). Derive a Laptop class that
is a kind of computer but
also specifies the object’s length, width, height, and weight. Member functions
for both classes should
include a default constructor, a constructor to inialize all components and a
function to display data
members.r.
*/

class Computer {
    private int wordSize;
    private int memorySize;
    private int storageSize;
    private int speed;

    public Computer() {
        this.wordSize = 0;
        this.memorySize = 0;
        this.storageSize = 0;
        this.speed = 0;
    }

    public Computer(int wordSize, int memorySize, int storageSize, int speed) {
        this.wordSize = wordSize;
        this.memorySize = memorySize;
        this.storageSize = storageSize;
        this.speed = speed;
    }

    public int getWordSize() {
        return wordSize;
    }

    public void setWordSize(int wordSize) {
        this.wordSize = wordSize;
    }

    public int getMemorySize() {
```

```
        return memorySize;
    }

    public void setMemorySize(int memorySize) {
        this.memorySize = memorySize;
    }

    public int getStorageSize() {
        return storageSize;
    }

    public void setStorageSize(int storageSize) {
        this.storageSize = storageSize;
    }

    public int getSpeed() {
        return speed;
    }

    public void setSpeed(int speed) {
        this.speed = speed;
    }

    void display() {
        System.out.println("Word Size: " + wordSize + " bits");
        System.out.println("Memory Size: " + memorySize + " MB");
        System.out.println("Storage Size: " + storageSize + " MB");
        System.out.println("Speed: " + speed + " MHz");
    }

}

class Laptop extends Computer {
    private int length;
    private int width;
    private int height;
    private int weight;

    public Laptop() {
        super();
        this.length = 0;
        this.width = 0;
        this.height = 0;
        this.weight = 0;
    }
```

```
    public Laptop(int wordSize, int memorySize, int storageSize, int speed, int
length, int width, int height,
            int weight) {
        super(wordSize, memorySize, storageSize, speed);
        this.length = length;
        this.width = width;
        this.height = height;
        this.weight = weight;
    }

    public int getLength() {
        return length;
    }

    public void setLength(int length) {
        this.length = length;
    }

    public int getWidth() {
        return width;
    }

    public void setWidth(int width) {
        this.width = width;
    }

    public int getHeight() {
        return height;
    }

    public void setHeight(int height) {
        this.height = height;
    }

    public int getWeight() {
        return weight;
    }

    public void setWeight(int weight) {
        this.weight = weight;
    }

    @Override
    void display() {
```

```
        super.display();
        System.out.println("Length: " + length + " cm");
        System.out.println("Width: " + width + " cm");
        System.out.println("Height: " + height + " cm");
        System.out.println("Weight: " + weight + " kg");
    }
}

public class GLT3 {
    public static void main(String[] args) {
        Computer c = new Computer(64, 8, 256, 2);
        Laptop l = new Laptop(64, 8, 256, 2, 30, 20, 2, 2);
        c.display();
        l.display();
    }

}
```

Output:

```
s-Java-Project\bin LAB6.GLT3
Word Size: 64 bits
Memory Size: 8 MB
Storage Size: 256 MB
Speed: 2 MHz
Word Size: 64 bits
Memory Size: 8 MB
Storage Size: 256 MB
Speed: 2 MHz
Length: 30 cm
Width: 20 cm
Height: 2 cm
Weight: 2 kg
PS D:\Ishtudy Material\3rd Sem\OOP\LABS\LabManual\src\LAB6>
```