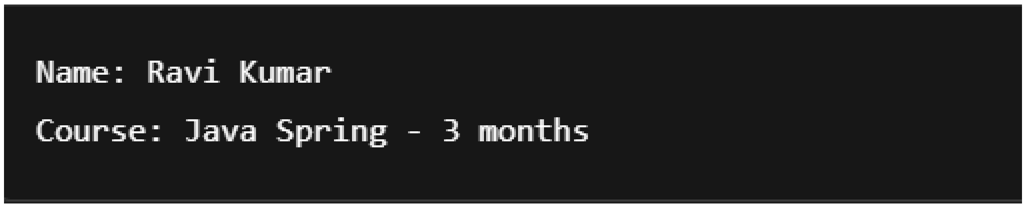
Experiment 9

Student Name: Tanu Pal **UID:22BCS16781**
Branch: BE-CSE **Section/Group:22BCSIOT-616-B**
Semester:6th **Date of Performance:21/04/25**
Subject Name: Project Based Learning in Java with Lab **Subject Code: 22CSH-359**

1.EASY LEVEL:

```
public class Course {
    private String courseName;
    private int duration;

    public Course(String courseName, int duration) {
        this.courseName = courseName;
        this.duration = duration;
    }

    public String getDetails() {
        return courseName + " - " + duration + " months";
    }
}

public class Student {
    private String name;
    private Course course;

    public Student(String name, Course course) {
        this.name = name;
        this.course = course;
    }

    public void displayInfo() {
        System.out.println("Name: " + name);
        System.out.println("Course: " + course.getDetails());
    }
}
```

```
import org.springframework.context.annotation.Bean;
import org.springframework.context.annotation.Configuration;

@Configuration
public class AppConfig {

    @Bean
    public Course course() {
        return new Course("Java Spring", 3);
    }

    @Bean
    public Student student() {
        return new Student("Ravi Kumar", course());
    }
}

import org.springframework.context.ApplicationContext;
import org.springframework.context.annotation.AnnotationConfigApplicationContext;

public class MainApp {
    public static void main(String[] args) {
        ApplicationContext context = new
AnnotationConfigApplicationContext(AppConfig.class);
        Student student = context.getBean(Student.class);
        student.displayInfo();
    }
}
```



```
Name: Ravi Kumar
Course: Java Spring - 3 months
```

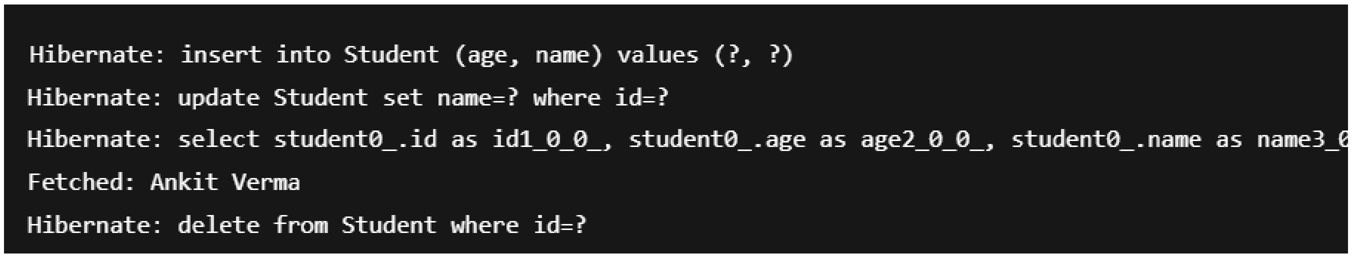
2. Medium level:

```
<!DOCTYPE hibernate-configuration PUBLIC
"-//Hibernate/Hibernate Configuration DTD 3.0//EN"
"http://hibernate.sourceforge.net/hibernate-configuration-3.0.dtd">

<hibernate-configuration>
  <session-factory>
    <property
name="hibernate.connection.driver_class">com.mysql.cj.jdbc.Driver</property>
    <property
name="hibernate.connection.url">jdbc:mysql://localhost:3306/your_db</property>
    <property name="hibernate.connection.username">root</property>
    <property name="hibernate.connection.password">password</property>
    <property name="hibernate.dialect">org.hibernate.dialect.MySQLDialect</property>
    <property name="hibernate.hbm2ddl.auto">update</property>
    <property name="show_sql">true</property>

    <mapping class="Student"/>
  </session-factory>
</hibernate-configuration>
```

```
import jakarta.persistence.*;

@Entity
public class Student {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int id;
    private String name;
    private int age;

    public Student() {}
    public Student(String name, int age) {
        this.name = name;
        this.age = age;
    }

    // Getters and Setters
}
```

```
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.cfg.Configuration;

public class StudentDAO {
    private static SessionFactory factory = new
Configuration().configure().buildSessionFactory();

    public void createStudent(Student s) {
        Session session = factory.openSession();
        session.beginTransaction();
        session.save(s);
        session.getTransaction().commit();
        session.close();
    }

    public void updateStudent(int id, String name) {
        Session session = factory.openSession();
        session.beginTransaction();
        Student s = session.get(Student.class, id);
        s.setName(name);
        session.update(s);
        session.getTransaction().commit();
        session.close();
    }

    public void deleteStudent(int id) {
        Session session = factory.openSession();
        session.beginTransaction();
        Student s = session.get(Student.class, id);
        session.delete(s);
        session.getTransaction().commit();
        session.close();
    }

    public Student readStudent(int id) {
        Session session = factory.openSession();
        return session.get(Student.class, id);
    }
}
```

```
public class MainApp {
    public static void main(String[] args) {
        StudentDAO dao = new StudentDAO();

        Student s1 = new Student("Ankit", 22);
        dao.createStudent(s1);

        dao.updateStudent(1, "Ankit Verma");

        Student student = dao.readStudent(1);
        System.out.println("Fetched: " + student.getName());

        dao.deleteStudent(1);
    }
}
```

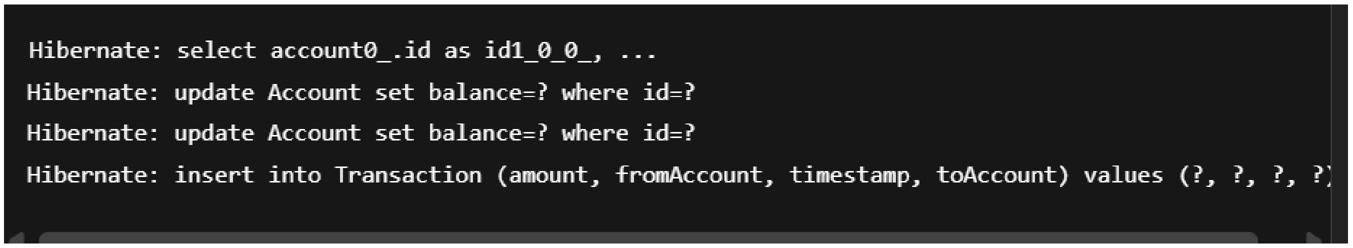


```
Hibernate: insert into Student (age, name) values (?, ?)
Hibernate: update Student set name=? where id=?
Hibernate: select student0_.id as id1_0_0_, student0_.age as age2_0_0_, student0_.name as name3_
Fetched: Ankit Verma
Hibernate: delete from Student where id=?
```

3.Hard Level:

```
import jakarta.persistence.*;

@Entity
public class Account {
    @Id
    private int id;
    private String name;
    private double balance;

    // Constructors, Getters, Setters
}
```

```
import jakarta.persistence.*;
import java.util.Date;

@Entity
public class Transaction {
    @Id
    @GeneratedValue(strategy = GenerationType.IDENTITY)
    private int id;
    private int fromAccount;
    private int toAccount;
    private double amount;
    private Date timestamp = new Date();

    // Constructors, Getters, Setters
}


import org.springframework.context.annotation.*;
import org.hibernate.SessionFactory;
import org.hibernate.cfg.Configuration;

@Configuration
public class AppConfig {
    @Bean
    public SessionFactory sessionFactory() {
        return new Configuration().configure().buildSessionFactory();
    }

    @Bean
    public BankService bankService() {
        return new BankService(sessionFactory());
    }
}


import org.hibernate.*;

public class BankService {
    private SessionFactory factory;

    public BankService(SessionFactory factory) {
        this.factory = factory;
    }

    public void transfer(int fromId, int toId, double amount) {
        Session session = factory.openSession();
        Transaction tx = null;

        try {
            tx = session.beginTransaction();
            Account from = session.get(Account.class, fromId);
            Account to = session.get(Account.class, toId);

            if (from.getBalance() < amount) {
                throw new RuntimeException("Insufficient balance");
            }

            from.setBalance(from.getBalance() - amount);
            to.setBalance(to.getBalance() + amount);

            session.update(from);
            session.update(to);

            Transaction t = new Transaction(fromId, toId, amount);
            session.save(t);

            tx.commit();
            System.out.println("Transfer successful.");
        } catch (Exception e) {
            if (tx != null) tx.rollback();
            System.out.println("Transfer failed: " + e.getMessage());
        } finally {
            session.close();
        }
    }
}


import org.springframework.context.ApplicationContext;
import org.springframework.context.annotation.AnnotationConfigApplicationContext;

public class MainApp {
    public static void main(String[] args) {
        ApplicationContext context = new
AnnotationConfigApplicationContext(AppConfig.class);
        BankService service = context.getBean(BankService.class);

        service.transfer(1, 2, 1000);
    }
}
```



```
Hibernate: select account0_.id as id1_0_0_, ...
Hibernate: update Account set balance=? where id=?
Hibernate: update Account set balance=? where id=?
Hibernate: insert into Transaction (amount, fromAccount, timestamp, toAccount) values (?, ?, ?, ?)
```