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Experiment: 9

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 getCourseName() {
        return courseName;
    }

    public int getDuration() {
        return duration;
    }

    public String toString() {
        return "Course: " + courseName + ", Duration: " + 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 showDetails() {
        System.out.println("Student Name: " + name);
        System.out.println(course.toString());
    }
}
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 Boot", 3);
    }

    @Bean
    public Student student() {
        return new Student("John Doe", course());
    }
}
import org.springframework.context.ApplicationContext;
import org.springframework.context.annotation.AnnotationConfigApplicationContext;
```

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

Medium level

```
import jakarta.persistence.*;

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

    // Getters and setters
    // toString() method
}
<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/yourdb</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="show_sql">true</property>
    <mapping class="Student"/>
  </session-factory>
</hibernate-configuration>
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.cfg.Configuration;

public class MainCrudApp {
    public static void main(String[] args) {
        SessionFactory factory = new Configuration().configure("hibernate.cfg.xml")
                                        .addAnnotatedClass(Student.class)
                                        .buildSessionFactory();
        Session session = factory.getCurrentSession();

        try {
            Student s1 = new Student();
            s1.setName("Bob");
            s1.setAge(22);

            session.beginTransaction();
            session.save(s1);  // Create
            session.getTransaction().commit();

            // Read
            session = factory.getCurrentSession();
            session.beginTransaction();
            Student readStudent = session.get(Student.class, s1.getId());
            System.out.println("Read: " + readStudent);
```

```
            // Update
            readStudent.setAge(23);
            session.getTransaction().commit();

            // Delete
            session = factory.getCurrentSession();
            session.beginTransaction();
            session.delete(readStudent);
            session.getTransaction().commit();
        } finally {
            factory.close();
        }
    }
}
```

Hard Level:

```
import jakarta.persistence.*;

@Entity
public class Account {
    @Id
    private int accountId;
    private String owner;
    private double balance;

    // Getters and setters
}
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.springframework.transaction.annotation.Transactional;
```

```
public class TransactionService {
    private SessionFactory sessionFactory;

    public TransactionService(SessionFactory factory) {
        this.sessionFactory = factory;
    }

    @Transactional
    public void transferFunds(int fromId, int toId, double amount) {
        Session session = sessionFactory.getCurrentSession();
        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.getTransaction().commit();
    }
}
import org.hibernate.SessionFactory;
import org.hibernate.cfg.Configuration;

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

```
        SessionFactory factory = new Configuration().configure()
                                        .addAnnotatedClass(Account.class)
                                        .buildSessionFactory();

        TransactionService service = new TransactionService(factory);

        try {
            service.transferFunds(1, 2, 1000);
            System.out.println("Transfer successful.");
        } catch (Exception e) {
            System.out.println("Transfer failed: " + e.getMessage());
        } finally {
            factory.close();
        }
    }
}
```