Lab Exercise: Working with Objects

Task 1: Create a Message object, persist it, get it detached, modify its text attribute, make it persistent again using the merge method.

Task 2: After having the detached Message object re-attached to the persistent state, check whether the modified state of the re-attached Message object is persisted to the database before or after the transaction is committed.

Task 3: Considering the bi-directional One-To-Many Guide-To-Student relationship as shown below, what should be the result of executing the HelloWorldClient class shown below?

```java
package entity;

import java.util.*;
import javax.persistence.*;

@Entity
public class Guide {

    @Id
    @GeneratedValue(strategy = GenerationType.AUTO)
    private Long id;

    @Column(name = "staff_id", nullable = false)
    private String staffId;

    private String name;
    private Integer salary;

    @OneToMany(mappedBy = "guide", cascade = {CascadeType.PERSIST})
    private Set<Student> students = new HashSet<Student>();

    public Guide() {}
    public Guide(String staffId, String name, Integer salary) {
        this.staffId = staffId;
        this.name = name;
        this.salary = salary;
    }

    public void addStudent(Student student) {
        students.add(student);
        student.setGuide(this);
    }

}
```

```java
package entity;

import javax.persistence.*;

@Entity
public class Student {

    @Id @GeneratedValue(strategy=GenerationType.AUTO)
    private Long id;

    @Column(name="enrollment_id", nullable=false)
    private String enrollmentId;

    private String name;

    @ManyToOne(cascade={CascadeType.PERSIST})
    @JoinColumn(name="guide_id")
    private Guide guide;

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

    public void setGuide(Guide guide) {
        this.guide = guide;
    }

}
```

```java
package client;

import javax.persistence.EntityManager;
import javax.persistence.EntityManagerFactory;
import javax.persistence.Persistence;

import entity.Guide;
import entity.Student;


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

        EntityManagerFactory emf = Persistence.createEntityManagerFactory("hello-world");

        EntityManager em1 = emf.createEntityManager();
        em1.getTransaction().begin();

        Guide guide = new Guide("2000RN10349", "Rose Ann", 4000);
        em1.persist(guide);

        em1.getTransaction().commit();
        em1.close();

        EntityManager em2 = emf.createEntityManager();
        em2.getTransaction().begin();

        Guide mergedGuide = em2.merge(guide);

        mergedGuide.addStudent(new Student("2015JR50244", "Jason Bird"));
        mergedGuide.addStudent(new Student("2015LK50878", "Lisa Mizuki"));

        em2.getTransaction().commit();
        em2.close();


    }
}
```

***The source code files for the lecture on "Working with Objects" are available to be downloaded with this lab exercise. You could use them to complete the given tasks successfully.