

## LAB 10

Q.1. Develop a basic Create, read operation using Hibernate for a simple entity, such as Student.

### Program files:

#### a). pom.xml

Program:

```
<project xmlns="http://maven.apache.org/POM/4.0.0"
xmlns:xsi="http://www.w3.org/2001/XMLSchema-instance"
xsi:schemaLocation="http://maven.apache.org/POM/4.0.0
http://maven.apache.org/xsd/maven-4.0.0.xsd">
  <modelVersion>4.0.0</modelVersion>

  <groupId>com.demo</groupId>
  <artifactId>college_management_system</artifactId>
  <version>0.0.1-SNAPSHOT</version>
  <packaging>jar</packaging>

  <name>college_management_system</name>
  <url>http://maven.apache.org</url>

  <properties>
    <project.build.sourceEncoding>UTF-8</project.build.sourceEncoding>
  </properties>
  <dependencies>
<!-- https://mvnrepository.com/artifact/org.hibernate/hibernate-core -->
<dependency>
<groupId>org.hibernate</groupId>
<artifactId>hibernate-core</artifactId>
<version>5.6.15.Final</version>
</dependency>
<!-- https://mvnrepository.com/artifact/mysql/mysql-connector-java -->
<dependency>
<groupId>mysql</groupId>
<artifactId>mysql-connector-java</artifactId>
<version>8.0.30</version>
</dependency>
    <dependency>
      <groupId>junit</groupId>
      <artifactId>junit</artifactId>
      <version>3.8.1</version>
      <scope>test</scope>
    </dependency>
  </dependencies>
</project>
```

## **b). hibernateUtil.java**

program:

```
package com.demo.college_management_system;
import org.hibernate.SessionFactory;
import org.hibernate.cfg.Configuration;
public class HibernateUtil {
    private static final SessionFactory = buildSessionFactory();
    private static SessionFactory buildSessionFactory() {
        try {
            return new
            Configuration().configure("hibernate.cfg.xml").addAnnotatedClass(Student.class)
            .buildSessionFactory();
        } catch (Throwable ex) {
            throw new ExceptionInInitializerError(ex);
        }
    }
    public static SessionFactory getSessionFactory() {
        return sessionFactory;
    }
}
```

## **c). hibernate.cfg.xml**

program:

```
<?xml version="1.0" encoding="UTF-8"?>
<!DOCTYPE hibernate-configuration PUBLIC
"-//Hibernate/Hibernate Configuration DTD 3.0//EN"
"http://www.hibernate.org/dtd/hibernate-configuration-3.0.dtd">
<hibernate-configuration>
<session-factory>
<!-- Database connection settings -->
<property name="connection.driver_class">com.mysql.cj.jdbc.Driver</property>
<property
name="connection.url">jdbc:mysql://localhost:3306/college_management_system</prop
erty>
<property name="connection.username">root</property>
<property name="connection.password">Abbu@05</property>
<!-- Automatically create or update database schema -->
<property name="hbm2ddl.auto">update</property>
<!-- Specify the dialect for your database -->
<property name="dialect">org.hibernate.dialect.MySQL8Dialect</property>
<!-- Enable or disable showing SQL statements in the console -->
<property name="show_sql">true</property>
<property name="format_sql">true</property>
<!-- Specify the package(s) where your entity classes are located -->
<mapping class="com.sms.Student"/>
<!-- Additional mappings can be included here -->
</session-factory>
</hibernate-configuration>
```

**d). Student.java****Program:**

```
package com.demo.college_management_system;
import java.time.LocalDate;
import java.time.LocalDate;

import javax.persistence.Column;
import javax.persistence.Entity;
import javax.persistence.Id;
import javax.persistence.Temporal;
import javax.persistence.TemporalType;
@Entity
public class Student {
    @Id
    @Column(name = "StudentId", length = 10)
    private String studentId;
    @Column(name = "FirstName", length = 50)
    private String firstName;
    @Column(name = "LastName", length = 25)
    private String lastName;
    @Column(name = "DateOfBirth")
    private LocalDate dateOfBirth;
    @Column(name = "Gender", length = 25)
    private String gender;
    @Column(name = "Email", length = 30)
    private String email;
    @Column(name = "Phone", length = 25)
    private String phone;
    //Setter and Getter
    public String getStudentId() {
        return studentId;
    }
    public void setStudentId(String studentId) {
        this.studentId = studentId;
    }
    public String getFirstName() {
        return firstName;
    }
    public void setFirstName(String firstName) {
        this.firstName = firstName;
    }
    public String getLastName() {
```

```
return lastName;
}
public void setLastName(String lastName) {
this.lastName = lastName;
}
public LocalDate getDateOfBirth() {
return dateOfBirth;
}
public void setDateOfBirth(LocalDate dateOfBirth) {
this.dateOfBirth = dateOfBirth;
}
public String getGender() {
return gender;
}
public void setGender(String gender) {
this.gender = gender;
}
public String getEmail() {
return email;
}
public void setEmail(String email) {
this.email = email;
}
public String getPhone() {
return phone;
}
public void setPhone(String phone) {
this.phone = phone;
}
//All argument Constructor
public Student(String studentId, String firstName, String
lastName, LocalDate dateOfBirth, String gender,String email,
String phone) {
super();
this.studentId = studentId;
this.firstName = firstName;
this.lastName = lastName;
this.dateOfBirth = dateOfBirth;
this.gender = gender;
this.email = email;
this.phone = phone;
}
```

**Student's Name: Patel Abubakar Siddique Mehboob**

```
//Default Constructor
public Student() {
    super();
}
//ToString method
@Override
public String toString() {
    return "Student [studentId=" + studentId + ", firstName=" +
    firstName + ",lastName=" + lastName+ ", dateOfBirth=" +
    dateOfBirth + ", gender=" + gender + ",email=" + email + ",
    phone=" + phone + "];"
}
}
```

**e). App.java****Program:**

```
package com.demo.college_management_system;
import java.time.LocalDate;
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;
public class App {
    public static void main(String[] args) {
        // Obtain a Hibernate SessionFactory
        SessionFactory factory = HibernateUtil.getSessionFactory();
        // Create a new Student
        LocalDate date1 = LocalDate.of(1988, 1, 13);
        Student Student1 = new Student("S111", "Oliver", "Henry",
        date1, "M","oliver@gmail.com", "6742906745");
        // Open a new session
        Session session = factory.openSession();
        // Begin a transaction
        Transaction transaction = session.beginTransaction();
        // Save the student to the database
        session.save(Student1);
        // Commit the transaction
        transaction.commit();
        // Close the Session
        session.close();
        // Close the Session Factory
        factory.close();
    }
}
```

Student's ID: AF0402433

Trainer's Name: Manali Ma'am

Student's Name: Patel Abubakar Siddique Mehboob

}

## Output Screen:

### Database Screen:

```
mysql> use college_management_system;
Database changed
mysql> select * from student;
+-----+-----+-----+-----+-----+-----+-----+
| StudentId | DateOfBirth | Email           | FirstName | Gender | LastName | Phone   |
+-----+-----+-----+-----+-----+-----+-----+
| S111      | 1988-01-13  | oliver@gmail.com | Oliver    | M      | Henry    | 6742906745 |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.02 sec)

mysql> drop database college_management_system;
Query OK, 1 row affected (2.09 sec)

mysql> create database college_management_system;
Query OK, 1 row affected (0.10 sec)

mysql> use college_management_system;
Database changed
mysql> show tables;
+-----+
| Tables_in_college_management_system |
+-----+
| student                             |
+-----+
1 row in set (0.03 sec)

mysql> select * from student;
+-----+-----+-----+-----+-----+-----+-----+
| StudentId | DateOfBirth | Email           | FirstName | Gender | LastName | Phone   |
+-----+-----+-----+-----+-----+-----+-----+
| S111      | 1988-01-13  | oliver@gmail.com | Oliver    | M      | Henry    | 6742906745 |
+-----+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

mysql> _
```

### Eclipse Screen:

```
Problems Javadoc Declaration Console X
<terminated> App (2) [Java Application] C:\Users\Pratapgad\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64.22.0.1.v20240426-1149\j
Jul 29, 2024 6:28:00 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HHH10001001: Connection properties: {password=****, user=root}
Jul 29, 2024 6:28:00 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HHH10001003: Autocommit mode: false
Jul 29, 2024 6:28:00 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl$PooledCon
INFO: HHH000115: Hibernate connection pool size: 20 (min=1)
Jul 29, 2024 6:28:02 PM org.hibernate.dialect.Dialect <init>
INFO: HHH000400: Using dialect: org.hibernate.dialect.MySQL8Dialect
Jul 29, 2024 6:28:03 PM org.hibernate.resource.transaction.backend.jdbc.internal.DdlTransactionIsolatorNonJtaImpl ge
INFO: HHH10001501: Connection obtained from JdbcConnectionAccess [org.hibernate.engine.jdbc.env.internal.JdbcEnviror
Hibernate:
    create table Student (
      StudentId varchar(10) not null,
      DateOfBirth date,
      Email varchar(30),
      FirstName varchar(50),
      Gender varchar(25),
      LastName varchar(25),
      Phone varchar(25),
      primary key (StudentId)
    ) engine=InnoDB
Jul 29, 2024 6:28:06 PM org.hibernate.engine.transaction.jta.platform.internal.JtaPlatformInitiator initiateService
INFO: HHH000490: Using JtaPlatform implementation: [org.hibernate.engine.transaction.jta.platform.internal.NoJtaPlat
Hibernate:
    insert
    into
      Student
      (DateOfBirth, Email, FirstName, Gender, LastName, Phone, StudentId)
    values
      (?, ?, ?, ?, ?, ?, ?)
Jul 29, 2024 6:28:06 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl$PoolState
INFO: HHH10001008: Cleaning up connection pool [jdbc:mysql://localhost:3306/college_management_system]
```

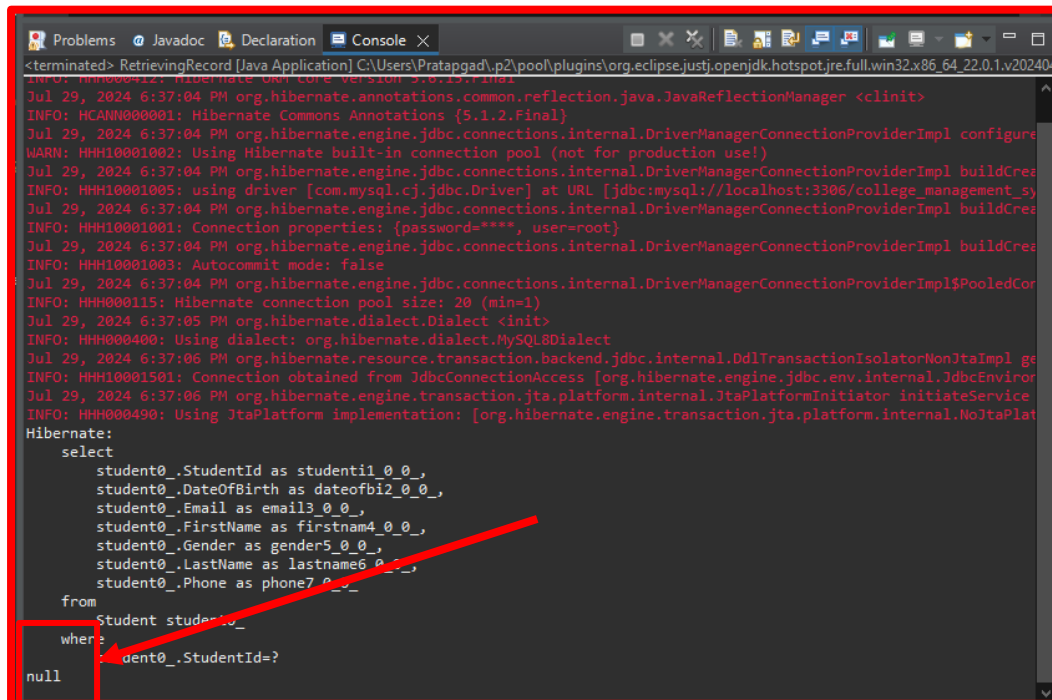


Student's ID: AF0402433

Trainer's Name: Manali Ma'am

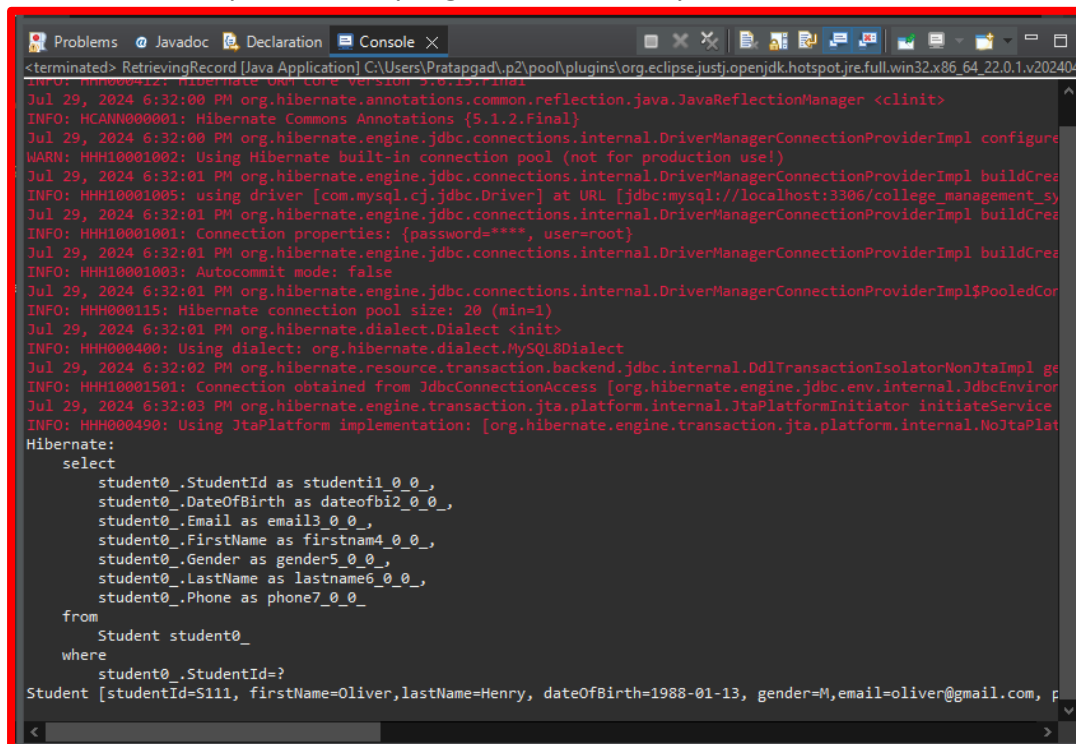
Student's Name: Patel Abubakar Siddique Mehboob

**Eclipse:** If the parameter (**StudentID="S112"**) of Object is not match with database's record then eclipse shows null:



```
<terminated> RetrievingRecord [Java Application] C:\Users\Pratapgad\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_22.0.1.v20240410\jre\bin\java.exe
INFO: HH000422: Hibernate ORM core version 5.6.15.Final
Jul 29, 2024 6:37:04 PM org.hibernate.annotations.common.reflection.java.JavaReflectionManager <clinit>
INFO: HCANN000001: Hibernate Commons Annotations {5.1.2.Final}
Jul 29, 2024 6:37:04 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl configure
WARN: HH0001002: Using Hibernate built-in connection pool (not for production use!)
Jul 29, 2024 6:37:04 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HH0001005: using driver [com.mysql.cj.jdbc.Driver] at URL [jdbc:mysql://localhost:3306/college_management_sy
Jul 29, 2024 6:37:04 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HH0001001: Connection properties: {password=****, user=root}
Jul 29, 2024 6:37:04 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HH0001003: Autocommit mode: false
Jul 29, 2024 6:37:04 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl$PooledCor
INFO: HH000115: Hibernate connection pool size: 20 (min=1)
Jul 29, 2024 6:37:05 PM org.hibernate.dialect.Dialect <init>
INFO: HH000400: Using dialect: org.hibernate.dialect.MySQL8Dialect
Jul 29, 2024 6:37:06 PM org.hibernate.resource.transaction.backend.jdbc.internal.DdlTransactionIsolatorNonJtaImpl ge
INFO: HH0001501: Connection obtained from JdbcConnectionAccess [org.hibernate.engine.jdbc.env.internal.JdbcEnviro
Jul 29, 2024 6:37:06 PM org.hibernate.engine.transaction.jta.platform.internal.JtaPlatformInitiator initiateService
INFO: HH000490: Using JtaPlatform implementation: [org.hibernate.engine.transaction.jta.platform.internal.NoJtaPlat
Hibernate:
select
  student0_.StudentId as student1_0_0_,
  student0_.DateOfBirth as dateofbi2_0_0_,
  student0_.Email as email3_0_0_,
  student0_.FirstName as firstnam4_0_0_,
  student0_.Gender as gender5_0_0_,
  student0_.LastName as lastname6_0_0_,
  student0_.Phone as phone7_0_0_
from
  Student student0_
where
  student0_.StudentId=?
null
```

**Eclipse:** If the parameter (**StudentID="S111"**) of Object is match with database's record then eclipse ran the program successfully and shows the record:



```
<terminated> RetrievingRecord [Java Application] C:\Users\Pratapgad\p2\pool\plugins\org.eclipse.justi.openjdk.hotspot.jre.full.win32.x86_64_22.0.1.v20240410\jre\bin\java.exe
INFO: HH000422: Hibernate ORM core version 5.6.15.Final
Jul 29, 2024 6:32:00 PM org.hibernate.annotations.common.reflection.java.JavaReflectionManager <clinit>
INFO: HCANN000001: Hibernate Commons Annotations {5.1.2.Final}
Jul 29, 2024 6:32:00 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl configure
WARN: HH0001002: Using Hibernate built-in connection pool (not for production use!)
Jul 29, 2024 6:32:01 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HH0001005: using driver [com.mysql.cj.jdbc.Driver] at URL [jdbc:mysql://localhost:3306/college_management_sy
Jul 29, 2024 6:32:01 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HH0001001: Connection properties: {password=****, user=root}
Jul 29, 2024 6:32:01 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl buildCrea
INFO: HH0001003: Autocommit mode: false
Jul 29, 2024 6:32:01 PM org.hibernate.engine.jdbc.connections.internal.DriverManagerConnectionProviderImpl$PooledCor
INFO: HH000115: Hibernate connection pool size: 20 (min=1)
Jul 29, 2024 6:32:01 PM org.hibernate.dialect.Dialect <init>
INFO: HH000400: Using dialect: org.hibernate.dialect.MySQL8Dialect
Jul 29, 2024 6:32:02 PM org.hibernate.resource.transaction.backend.jdbc.internal.DdlTransactionIsolatorNonJtaImpl ge
INFO: HH0001501: Connection obtained from JdbcConnectionAccess [org.hibernate.engine.jdbc.env.internal.JdbcEnviro
Jul 29, 2024 6:32:03 PM org.hibernate.engine.transaction.jta.platform.internal.JtaPlatformInitiator initiateService
INFO: HH000490: Using JtaPlatform implementation: [org.hibernate.engine.transaction.jta.platform.internal.NoJtaPlat
Hibernate:
select
  student0_.StudentId as student1_0_0_,
  student0_.DateOfBirth as dateofbi2_0_0_,
  student0_.Email as email3_0_0_,
  student0_.FirstName as firstnam4_0_0_,
  student0_.Gender as gender5_0_0_,
  student0_.LastName as lastname6_0_0_,
  student0_.Phone as phone7_0_0_
from
  Student student0_
where
  student0_.StudentId=?
Student [studentId=S111, firstName=Oliver,lastName=Henry, dateOfBirth=1988-01-13, gender=M,email=oliver@gmail.com, p
```



Q.3. Also demonstrate use of load() method.

## Program Files:

### RetrieveRecord.java

```
import org.hibernate.Session;
import org.hibernate.SessionFactory;
import org.hibernate.Transaction;

import com.demo.college_management_system.HibernateUtil;
import com.demo.college_management_system.Student;
public class RetrievingRecord {
public static void main(String[] args) {
// Obtain a Hibernate SessionFactory
SessionFactory factory = HibernateUtil.getSessionFactory();
// Open a new session
Session session = factory.openSession();
// Begin a transaction
Transaction transaction = session.beginTransaction();
// Retrieve the object using the primary key
Student student=session.load(Student.class, "S111");
//display data using toString() method
System.out.println(student);
// Commit the transaction
transaction.commit();
// Close the session
session.close();
}
}
```

## Output Screen:

Database:

```
mysql> select * from Student where StudentID="S111";
+-----+-----+-----+-----+-----+-----+
| StudentId | DateOfBirth | Email | FirstName | Gender | LastName | Phone |
+-----+-----+-----+-----+-----+-----+
| S111 | 1988-01-13 | oliver@gmail.com | Oliver | M | Henry | 6742906745 |
+-----+-----+-----+-----+-----+-----+
1 row in set (0.00 sec)

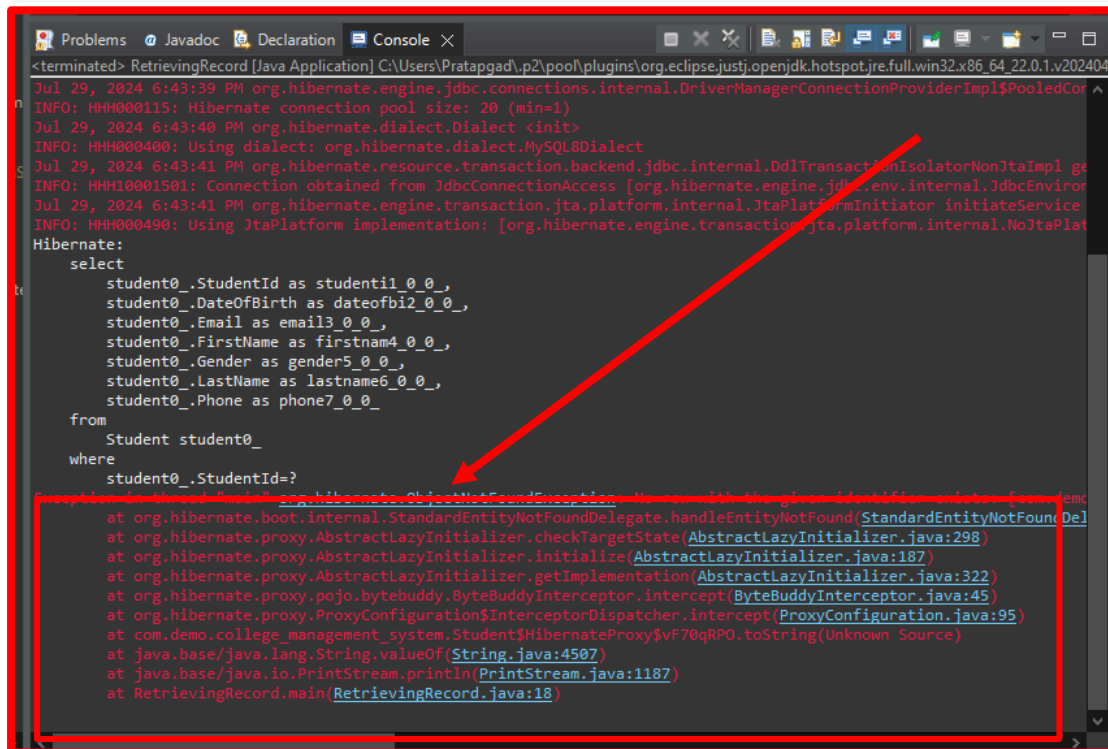
mysql> _
```

Student's ID: AF0402433

Trainer's Name: Manali Ma'am

Student's Name: Patel Abubakar Siddique Mehboob

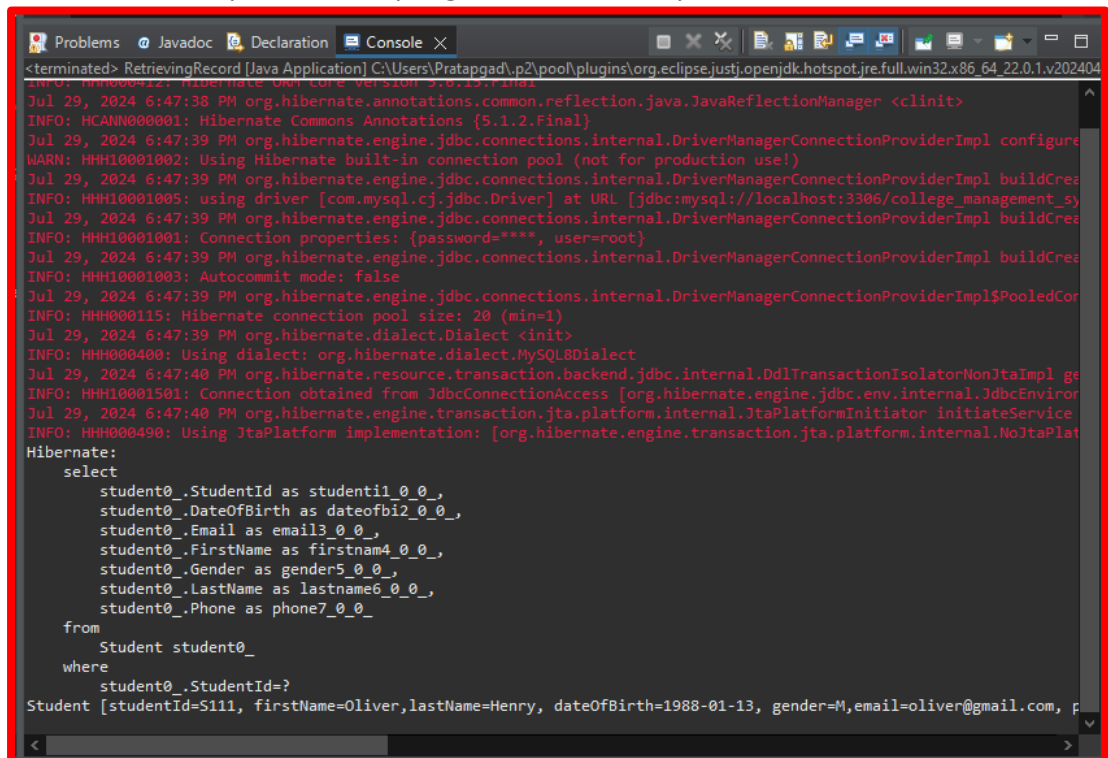
**Eclipse:** If the parameter (**StudentID="S112"**) of Object is not match with database's record then eclipse shows an exception:



The screenshot shows the Eclipse IDE console with a red box highlighting an exception. A red arrow points to the line `student0_.StudentId=?` in the SQL query. The exception is `org.hibernate.exception.EntityNotFoundException: No object with the given identifier exists for [com.demo.college_management_system.Student]`. The stack trace includes:

```
at org.hibernate.boot.internal.StandardEntityNotFoundDelegate.handleEntityNotFound(StandardEntityNotFoundDelegate.java:298)
at org.hibernate.proxy.AbstractLazyInitializer.checkTargetState(AbstractLazyInitializer.java:298)
at org.hibernate.proxy.AbstractLazyInitializer.initialize(AbstractLazyInitializer.java:187)
at org.hibernate.proxy.AbstractLazyInitializer.getImplementation(AbstractLazyInitializer.java:322)
at org.hibernate.proxy.pojo.bytebuddy.ByteBuddyInterceptor.intercept(ByteBuddyInterceptor.java:45)
at org.hibernate.proxy.ProxyConfiguration$InterceptorDispatcher.intercept(ProxyConfiguration.java:95)
at com.demo.college_management_system.Student$HibernateProxy$VF70qRP0.toString(Unknown Source)
at java.base/java.lang.String.valueOf(String.java:4507)
at java.base/java.io.PrintStream.println(PrintStream.java:1187)
at RetrievingRecord.main(RetreivingRecord.java:18)
```

**Eclipse:** If the parameter (**StudentID="S111"**) of Object is match with database's record then eclipse ran the program successfully and shows the record:



The screenshot shows the Eclipse IDE console with a red box highlighting the successful execution of the program. The output shows the SQL query and the resulting record:

```
select
  student0_.StudentId as studentid1_0_0_,
  student0_.DateOfBirth as dateofbi2_0_0_,
  student0_.Email as email3_0_0_,
  student0_.FirstName as firstnam4_0_0_,
  student0_.Gender as gender5_0_0_,
  student0_.LastName as lastname6_0_0_,
  student0_.Phone as phone7_0_0_
from
  Student student0_
where
  student0_.StudentId=?
Student [studentId=S111, firstName=Oliver, lastName=Henry, dateOfBirth=1988-01-13, gender=M, email=oliver@gmail.com, phone=9876543210]
```