URL to GitHup Repository: https://github.com/aliustunyer/CRUD-Operations-MySQL-Week-9.git

URL to Youtube Video : https://youtu.be/0o6vp4c1_Rs

```
package projects.dao;

import java.math.BigDecimal;
import java.sql.Connection;
import java.sql.PreparedStatement;
import java.sql.SQLException;

import projects.entity.Project;
import projects.exception.DbException;
import provided.util.DaoBase;

public class ProjectDao extends DaoBase {

	private static final String CATEGORY_TABLE = "category";
	private static final String MATERIAL_TABLE = "material";
	private static final String PROJECT_TABLE = "project";
	private static final String PROJECT_CATEGORY_TABLE = "project_category";
	private static final String STEP_TABLE = "step";



	public Project insertProject(Project project) {
		//@formatter : off
		String sql = ""
		+ "INSERT INTO " + PROJECT_TABLE + " "
		+ "(project_name, estimated_hours, actual_hours, difficulty, notes) "
	    + "VALUES "
		+ "(?, ?, ?, ?, ?)";
		//@formatter : on

		try (Connection conn = DbConnection.getConnection()) {
		startTransaction(conn);

	   try (PreparedStatement stmt = conn.prepareStatement(sql)){
		setParameter (stmt, 1, project.getProjectName(), String.class);
		setParameter (stmt, 2, project.getEstimatedHours(), BigDecimal.class);
		setParameter (stmt, 3, project.getActualHours(), BigDecimal.class);
		setParameter (stmt, 4, project.getDifficulty(), Integer.class);
		setParameter (stmt, 5, project.getNotes(), String.class);

		stmt.executeUpdate();
		Integer projectId = getLastInsertId (conn, PROJECT_TABLE);
		commitTransaction(conn);
		project.setProjectId(projectId);
		return project;

	   } catch (Exception e) {
		    rollbackTransaction (conn);
		    throw new DbException (e);
	   }
```

```
        } catch (SQLException e) {
            throw new DbException(e);
        }

      }
      }
```

```
package projects.service;

import projects.dao.ProjectDao;
import projects.entity.Project;

public class ProjectService {

      private ProjectDao projectDao = new ProjectDao();

      public Project addProject(Project project) {

            return projectDao.insertProject(project);
      }

}
```

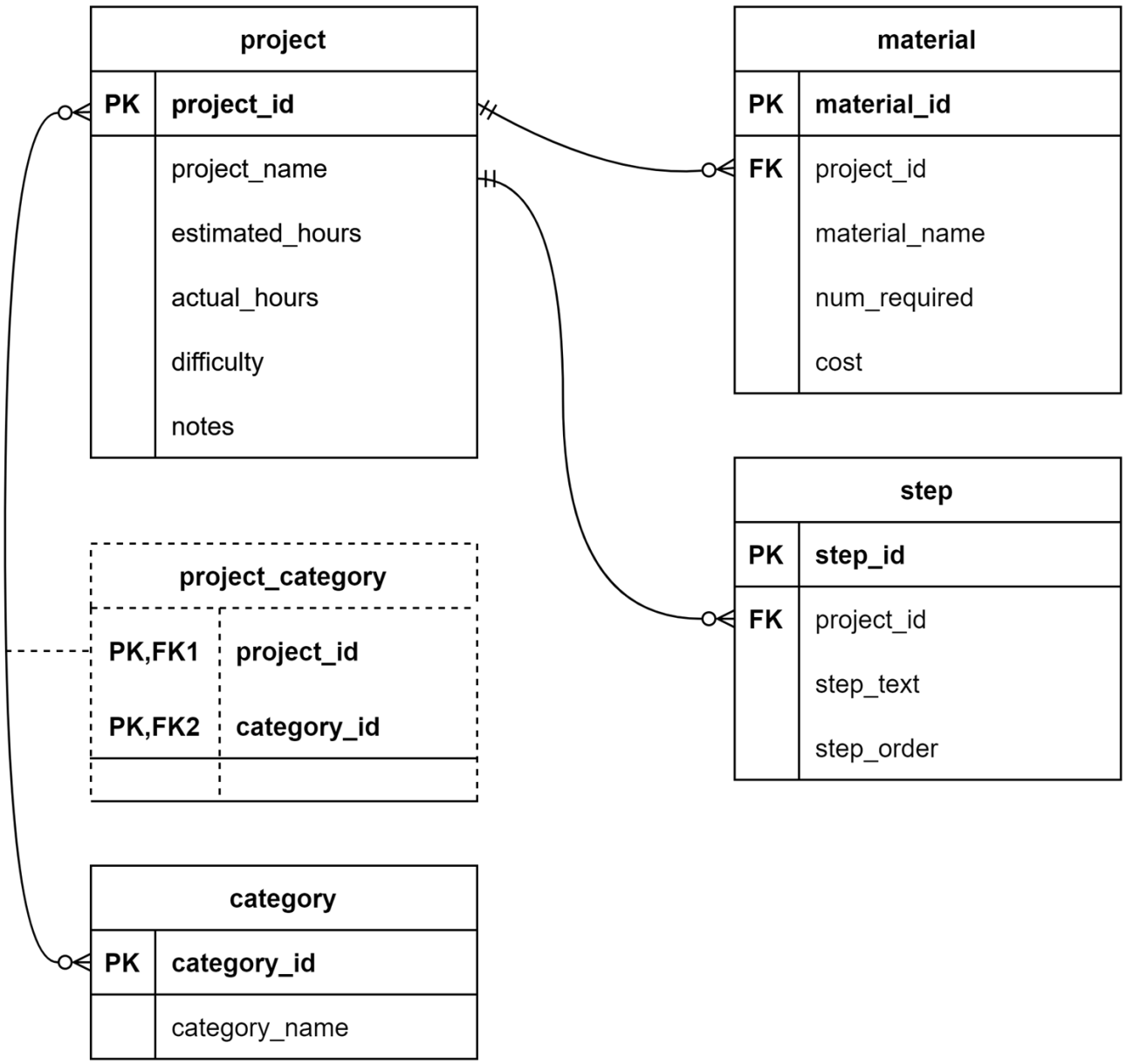
```
package projects;

import java.math.BigDecimal;
import java.util.List;
import java.util.Objects;
import java.util.Scanner;

import projects.entity.Project;
import projects.exception.DbException;
import projects.service.ProjectService;

public class ProjectsApp {


            private ProjectService projectService = new ProjectService();

            //@formatter : off
      private List<String> operations = List.of (
                  "1} Add a project"
            );
            //@formatter : on
      private Scanner scanner = new Scanner (System.in);

      public static void main(String[] args) {

            new ProjectsApp().processUserSelections();

}

      private void processUserSelections() {
            boolean done = false ;

            while (!done) {
                  try {
                        int selection = getUserSelection();
```

```
                        switch (selection) {
                        case -1 :
                              done = exitMenu();
                              break;
                        case 1 :
                              createProject();
                              break;
                        default :
                              System.out.println("\n" + selection + " is not a
valid selection. Try again.");
                              break;

                        }
                  }
                  catch (Exception e) {
                        System.out.println ("\nError: "+ e + ". Try again.");
                  }
            }
      }

      private void createProject() {

            String projectName = getStringInput ("Enter the project name");
            BigDecimal estimatedHours = getDecimalInput("Enter the estimated
hours");
            BigDecimal actualHours = getDecimalInput("Enter the actual hours");
            Integer difficulty = getIntInput("Enter the project difficulty (1-5)");
            String notes = getStringInput ("Enter the projects notes");

            Project project = new Project();

            project.setProjectName(projectName);
            project.setEstimatedHours(estimatedHours);
            project.setActualHours(actualHours);
            project.setDifficulty(difficulty);
            project.setNotes(notes);

            Project dbProject = projectService.addProject(project);
            System.out.println("You have successfully created project: " +
dbProject);




      }

      private BigDecimal getDecimalInput(String prompt) {
            String input = getStringInput(prompt);

            if (Objects.isNull(input)) {
                  return null;
            }
            try {
                  return new BigDecimal(input).setScale(2);

            }
            catch (NumberFormatException e) {
                  throw new DbException(input + " is not a valid decimal number");
```

```
            }
      }

      private boolean exitMenu() {
            System.out.println("Exiting the menu.");
            return true;
      }

      private int getUserSelection() {
            printoperations ();

            Integer input = getIntInput ("Enter a menu selection");

            return Objects.isNull(input)? -1 : input;
      }

      private Integer getIntInput(String prompt) {
            String input = getStringInput(prompt);

            if (Objects.isNull(input)) {
                  return null;
            }
            try {
                  return Integer.valueOf(input);

            }
            catch (NumberFormatException e) {
                  throw new DbException(input + " is not a valid number");

            }
      }

      private String getStringInput(String prompt) {
            System.out.print(prompt + ": ");
            String input = scanner.nextLine();
            return input.isBlank() ? null: input.trim();
      }

      private void printoperations() {
            System.out.println( "\nThese are the available selections. Press the
Enter key to quit:" );

            operations.forEach (line -> System.out.println("  "+ line));

      }
}
```

```sql
CREATE TABLE project (
  project_id INT AUTO_INCREMENT NOT NULL,
  project_name VARCHAR(128) NOT NULL,
  estimated_hours DECIMAL (7,2),
  actual_hours DECIMAL (7,2),
  difficulty INT,
  notes TEXT,
  PRIMARY KEY (project_id)
);

CREATE TABLE category (
  category_id INT AUTO_INCREMENT NOT NULL,
  category_name VARCHAR(128) NOT NULL,
  PRIMARY KEY (category_id)
);

CREATE TABLE project_category (
  project_id INT NOT NULL,
  category_id INT NOT NULL,
  FOREIGN KEY (project_id) REFERENCES project (project_id) ON DELETE CASCADE,
  FOREIGN KEY (category_id) REFERENCES category (category_id) ON DELETE CASCADE,
  UNIQUE KEY (project_id, category_id)
);

CREATE TABLE step (
  step_id INT AUTO_INCREMENT NOT NULL,
  project_id INT NOT NULL,
  step_text TEXT NOT NULL,
  step_order INT NOT NULL,
  PRIMARY KEY (step_id),
  FOREIGN KEY (project_id) REFERENCES project (project_id) ON DELETE CASCADE
);

CREATE TABLE material (
  material_id INT AUTO_INCREMENT NOT NULL,
  project_id INT NOT NULL,
  material_name VARCHAR(128) NOT NULL,
  num_required INT,
  cost DECIMAL(7, 2),
  PRIMARY KEY (material_id),
  FOREIGN KEY (project_id) REFERENCES project (project_id) ON DELETE CASCADE
  );
```

ERD ;


project
PK
project_id
project_name
estimated_hours
actual_hours
difficulty
notes
material
PK
material_id
FK
project_id
material_name
num_required
cost
step
PK
step_id
FK
project_id
step_text
step_order
project_category
PK,FK1
project_id
PK,FK2
category_id
category
PK
category_id
category_name

Main Class (ProjectApp)

```
package projects;

import projects.dao.DbConnection;

public class ProjectsApp {

	public static void main(String[] args) {

		DbConnection.getConnection();

	}

}
```

Class (Db Connection)

```
package projects.dao;

import java.sql.Connection;
import java.sql.DriverManager;
import java.sql.SQLException;

import projects.exception.DbException;

public class DbConnection {

	private static final String HOST = "localhost";
	private static final String PASSWORD = "projects";
	private static final int PORT = 3306;
	private static final String SCHEMA = "projects";
	private static final String USER = "projects";


	public static Connection getConnection() {

		String url =
String.format("jdbc:mysql://%s:%d/%s?user=%s&password=%s&useSSL=false", HOST, PORT,
SCHEMA, USER,
				PASSWORD);

		System.out.println("Connecting with url =" + url);

		try {
```

```
                    Connection conn =DriverManager.getConnection(url);
                    System.out.println("Successfully obtained connection!");
                    return conn;
                } catch (SQLException e) {

                    throw new DbException(e);
                }

        }
}
```

Class (Db Connection)

```
package projects.exception;

@SuppressWarnings("serial")
public class DbException extends RuntimeException {

        public DbException() {

        }

        public DbException(String message) {
                super(message);

        }

        public DbException(Throwable cause) {
                super(cause);

        }

        public DbException(String message, Throwable cause) {
                super(message, cause);

        }

}
```

pom.xml

```
<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 https://maven.apache.org/xsd/maven-
4.0.0.xsd">

 <modelVersion>4.0.0</modelVersion>
  <groupId>com.promineotech</groupId>
  <artifactId>mysql-java</artifactId>
  <version>0.0.1-SNAPSHOT</version>


  <properties>
<java.version>17</java.version>
</properties>

<dependencies>
        <dependency>
                <groupId>com.mysql</groupId>
                <artifactId>mysql-connector-j</artifactId>
                <version>8.0.32</version>
        </dependency>
</dependencies>

<build>
   <pluginManagement>
     <plugins>
       <plugin>
         <groupId>org.apache.maven.plugins</groupId>
         <artifactId>maven-compiler-plugin</artifactId>
         <version>3.10.1</version>
         <configuration>
                        <source>${java.version}</source>
                        <target>${java.version}</target>
         </configuration>
       </plugin>
     </plugins>
   </pluginManagement>
  </build>

</project>
```