Endterm project. Report.

Library Management System.

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Object-Oriented Programming (Java)

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# Introduction

# Project Description:

This document contributes to knowledge by modeling and design of a hypothetical library database by additional implementation in Java. The developed project can serve as the fundament of Library Information System. The goal of the project is to create a project that will allow the Library System to provide information about the books and students. One of the main goals is to provide information about books for students exactly.

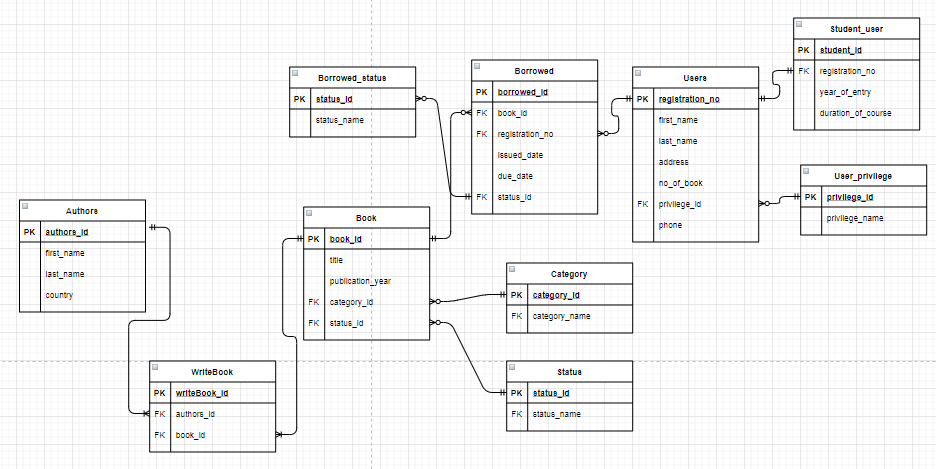
# Goals & Objectives

Overall, the administration of the school is database's client, however the primary users are students. They will use the database to input data about new books.

# Business Rules:

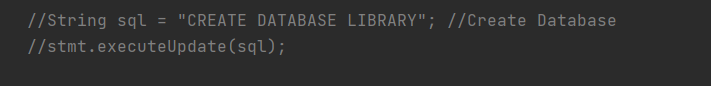
* The library manages books and users.
* Books are available in the library for user to read or borrow.
* A book must have an author.
* A category includes some books with similar characteristics.
* A book must have status (borrowed or not borrowed).
* An author may write several books.
* User is a person that is registered in the library.
* A user can be a student.
* A user may have privilege (gold, silver, platinum, bronze cards).
* Student user may borrow several books at a time.

# Entity-Relationship Diagram (ERD)

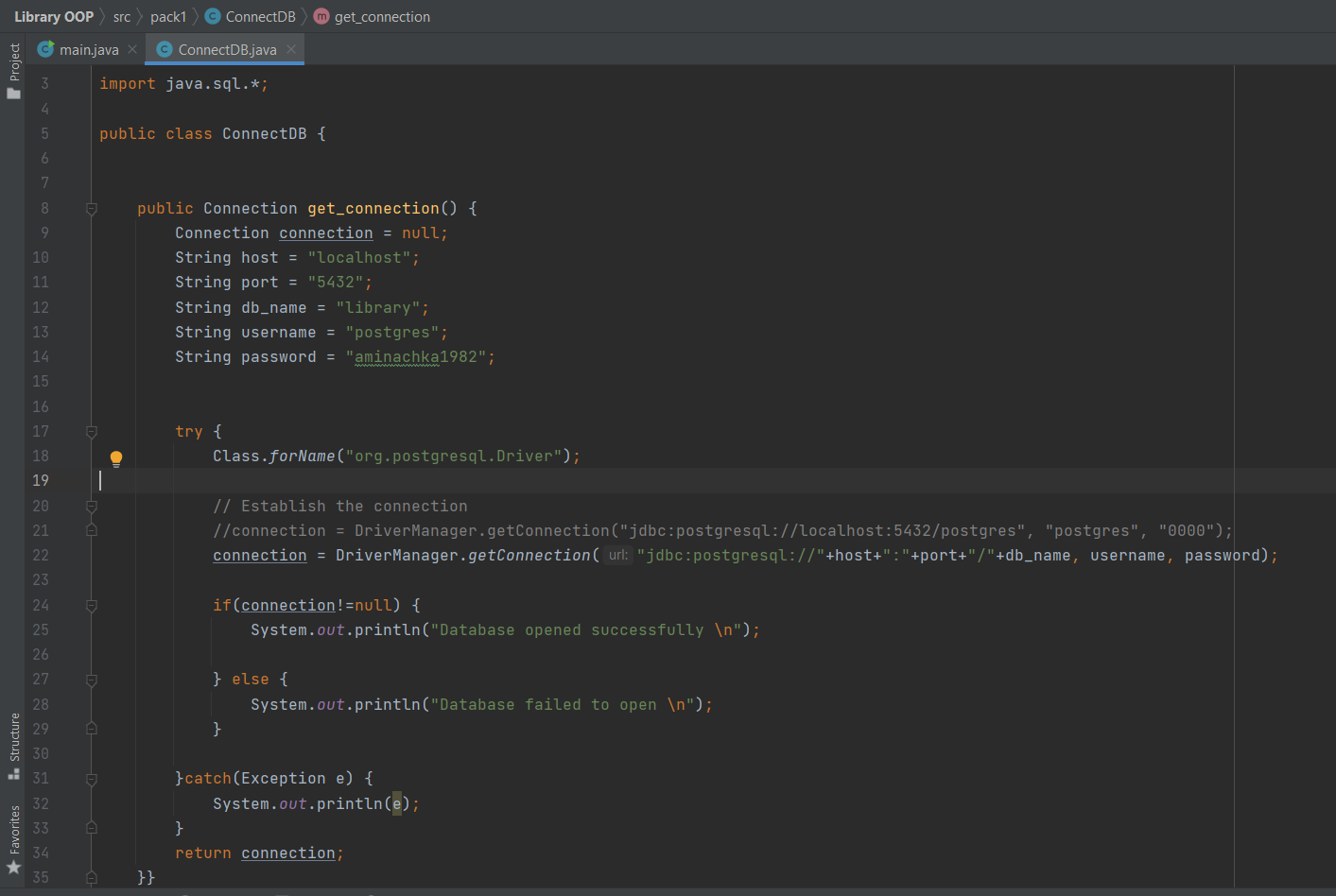
Please, zoom to see details of ER diagram. 

**Project implementation**

Firstly, we have created our new database connected with out topic “Library management system”

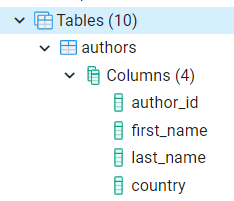
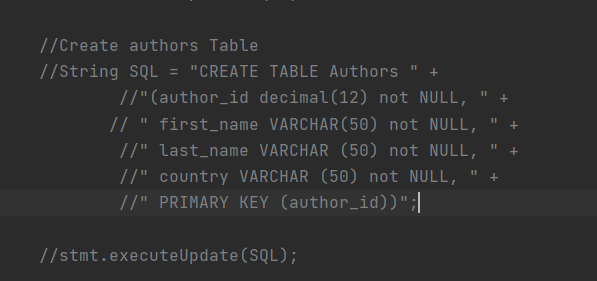


Here is the connection to the database created in pgAdmin by changing password and database name

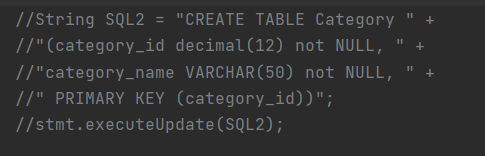
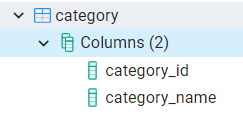


After we proceeded to create tables

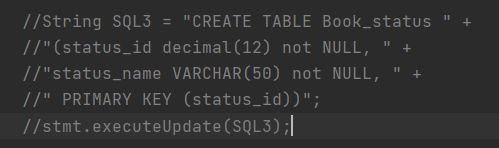
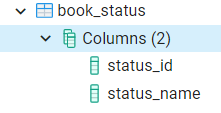
This is the creation of the first table Authors and result



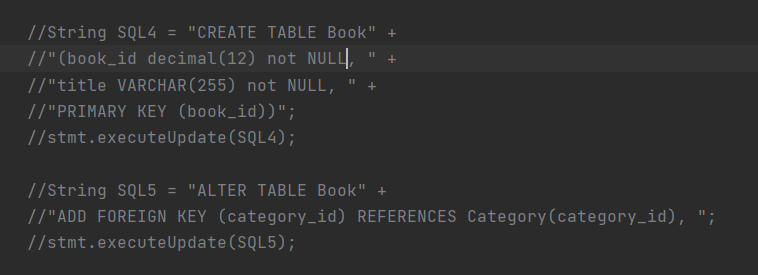
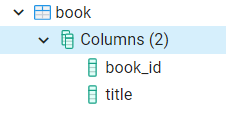
Creation of the table Category and result

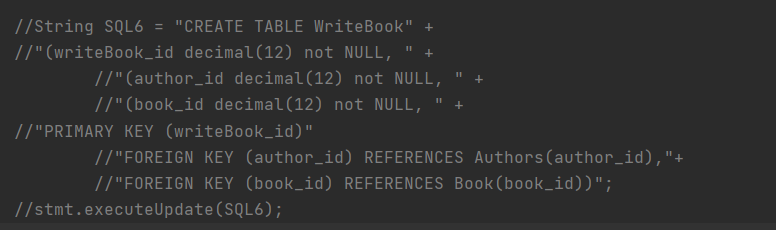
Creation of the table Book status and result

Creation of the table Book and result

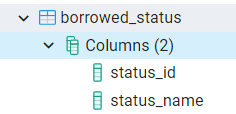
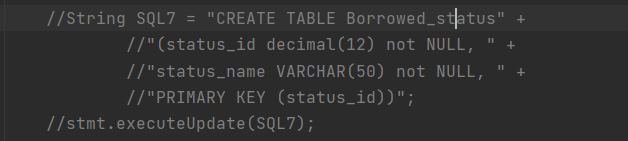
 

Creation of the table Write Book and result

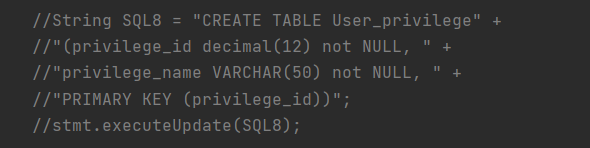
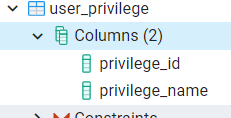




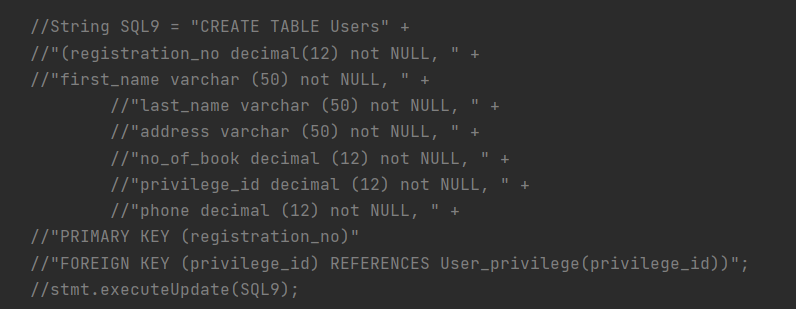
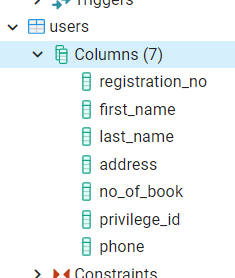
Creation of the table Borrowed status and result



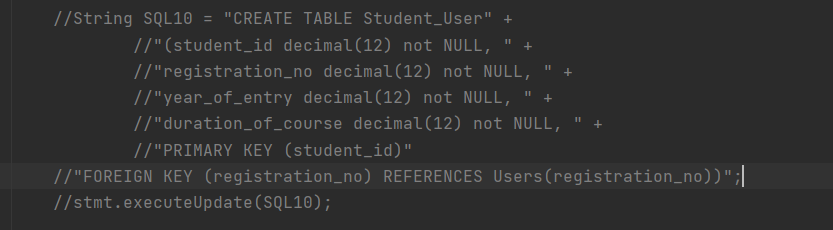
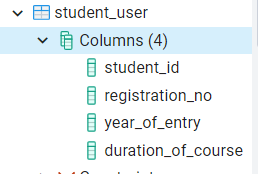
Creation of the table User privilege status and result

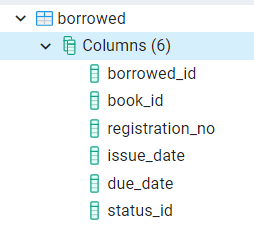
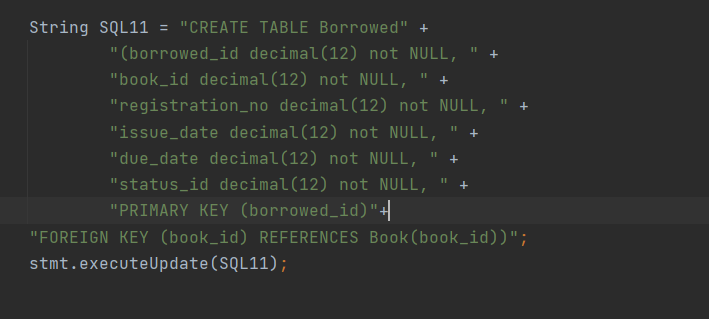
Creation of the table User status and result

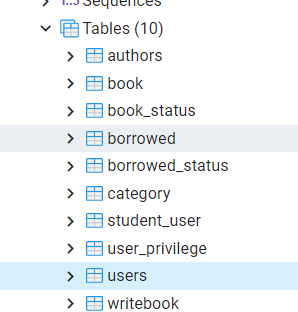
Creation of the table Student User status and result

Creation of the last table Borrowed status and result



As a result we have 10 tables



**The second try**

After an unsuccessful attempt, we tried another project idea: Simple Library management system project for JAVA.

package com.company;  
import java.sql.Connection;  
import java.sql.DriverManager;  
import java.sql.SQLException;  
  
public class ConnectDB {  
  
 public Connection get\_connection() throws SQLException{  
 String url ="jdbc:postgresql://localhost:5432/postgres";  
 String user = "postgres";  
 String password = "postgres";  
  
 try {  
 Connection connection = DriverManager.*getConnection*(url,user,password);  
 return connection;  
 } catch (Exception e) {  
 System.*out*.println(e.getMessage());  
 return null;  
 }  
  
 }  
}

At the beginning we create database connections. We are using postgresql pgadmin, however we tried using mysql as well. There is also try-catch construction for the exception.

package com.company;  
  
public class Module1 {  
  
 String name,fname,uni\_id,uid;  
 int sem;  
  
 public void getdata(String name, String fname,String uni\_id, String uid, int sem){  
 this.name=name;  
 this.fname=fname;  
 this.uni\_id=uni\_id;  
 this.uid=uid;  
 this.sem=sem;  
 }  
  
 public void setdata(){  
 System.*out*.println("Student's name: "+name);  
 System.*out*.println("Student's father name: "+fname);  
 System.*out*.println("University id: "+uni\_id);  
 System.*out*.println("User id: "+ uid);  
 System.*out*.println("Semester: "+sem);  
  
 }  
  
  
}

Then we have created the class Module1 , which includes constructor for 5 fields(name of the student, father’s name, university id, id and semester).

package com.company;  
  
public class Module2 {  
  
  
 public void chemistry(){  
 System.*out*.println("");  
 String chem[]={"Organic chemistry","Physical chemistry","Bio chemistry","Inorganic chemistry","Polymer chemistry"};  
 System.*out*.println("The books available in chemistry department are as follow:");  
 for (int i=0;i< chem.length;i++){  
 System.*out*.println(chem[i]);  
 }  
  
 }  
  
 public void physics(){  
 System.*out*.println("");  
 String phy[]={"Mechanics","Dynamics","Solid State Physics","Astro Physics","Electromagnetism"};  
 System.*out*.println("The books available in Physics department are as follow:");  
 for (int j=0;j< phy.length;j++){  
 System.*out*.println(phy[j]);  
 }  
 }  
  
 public void biology(){  
 System.*out*.println("");  
 String bio[]={"Ecology","Botany","Medical Science","Anatomy","Microbiology"};  
 System.*out*.println("The books available in Physics department are as follow:");  
 for (int k=0;k< bio.length;k++){  
 System.*out*.println(bio[k]);  
 }  
 }

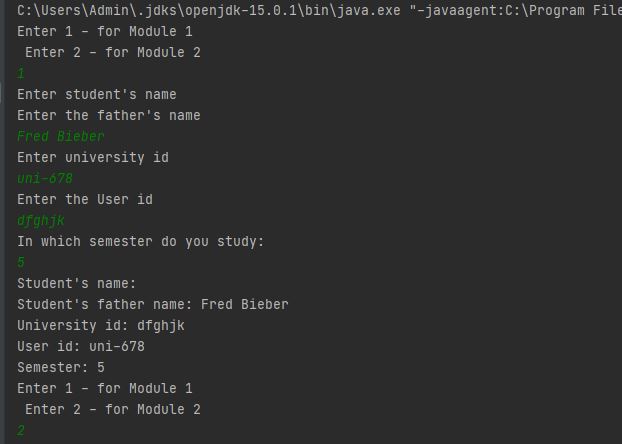
Then we have created the second class Module2 , consequently we added 3 methods for Physics, chemistry and biology departments. Each of them has an array of different books according to the sphere.

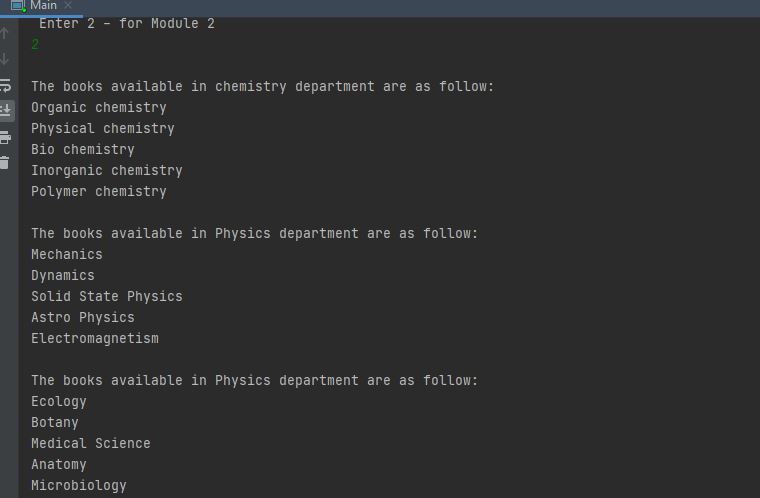
package com.company;  
import java.util.Scanner;  
  
  
  
public class Main {  
  
  
  
 public static void main(String[] args) {  
 Scanner obj=new Scanner(System.*in*);  
  
 int choice=0;  
  
 while (choice !=3){  
  
 System.*out*.println("Enter 1 - for Module 1 \n Enter 2 - for Module 2");  
 choice=obj.nextInt();  
  
 if (choice ==1){  
 Module1 obj1=new Module1();  
 System.*out*.println("Enter student's name");  
 obj1.name=obj.nextLine();  
 System.*out*.println("Enter the father's name");  
 obj1.fname=obj.nextLine();  
 System.*out*.println("Enter university id");  
 obj1.uni\_id=obj.nextLine();  
 System.*out*.println("Enter the User id");  
 obj1.uid=obj.nextLine();  
 System.*out*.println("In which semester do you study:");  
 obj1.sem=obj.nextInt();  
  
 obj1.getdata(obj1.name, obj1.fname, obj1.uid, obj1.uni\_id, obj1.sem);  
 obj1.setdata();  
  
 }  
  
 else if (choice==2){  
 Module2 obj2=new Module2();  
  
 obj2.chemistry();  
 obj2.physics();  
 obj2.biology();  
 }  
  
 }  
  
 }  
}

Then we add scanner to input value for the user. As a result the program asks the options 1 or 2:

1. Asks name, father’s name, university id, id and semester.
2. Output different books according to the department.

Output:





**Conclusion**

The project was to be based on the implementation of all aspects passed. However, not all details have been successfully implemented. In general, the project will develop.

**Reflection**

According to the SWOT analysis:

|  |  |
| --- | --- |
| Strengths | Weaknesses |
| Project Description  Project goals constructed  Project objectives  Partially implementation  Connection to the database  Erd diagram | Incomplete implementation |
| Opportunities | Threats |
| Future realization | lack of free time for development |

**Plans for improvement**

We plan to engage in further implementation of the project by adding other aspects of the project.

**References**

* Diagrams.net - free flowchart maker and diagrams online. (n.d.). Retrieved November 21, 2020, from https://app.diagrams.net/