CSC 221 Final project.

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Introduction

The goal of this project was to create populate and control a database from java.After that was done we had to query the data base for specific values and put it on a Piechart displaying the proportions of the gpa in the class.

Method

My project consisted of three parts ,and in order to learn more I decided to not use listing 25 but use mysqlite so I could learn a little more about relational databases, the first part was the class that connected java to my sqllite database called connectTodb.java. I first connected to the database by creating a connection “**static** Connection *c* = **null**”.

Then assigning the connection to the jdbc Drivermanger fuction that returns a connection from the database url. Also because java has no real inbuilt header to extract and control database a special driver the jdbc had to be imported. And if the connection goes through you are notified else you are also promoted. After this the user is given a bunch of options whether they want to populate the table or the gpa of students using a switch statement if the user wants to see the gpa the code queries the data base for the data that fit the query.

code of this class is given below.

**package** com.db;

**import** **static** java.util.Map.Entry.*comparingByValue*;

**import** **static** java.util.stream.Collectors.*toMap*;

**import** java.sql.\*;

**import** java.util.HashMap;

**import** java.util.LinkedHashMap;

**import** java.util.Scanner;

**public** **class** connecToDb {

**static** String *codev* = "CSc";

**static** HashMap<Character, Integer> *hash* = **new** HashMap<>();

**static** Connection *c* = **null**;

**public** connecToDb() {

String quan = "CSc";

}

**public** **static** HashMap<Character, Integer> createconnect() **throws** SQLException {

*hash*.put('A', 0);

*hash*.put('B', 0);

*hash*.put('C', 0);

*hash*.put('D', 0);

*hash*.put('E', 0);

*hash*.put('F', 0);

*hash*.put('W', 0);

**try** {

Class.*forName*("org.sqlite.JDBC");// load driver

*c* = DriverManager.*getConnection*("jdbc:sqlite:info.db");

System.***out***.println("connection succesful");

} **catch** (Exception e) {

System.***out***.println("connection failed");

System.*exit*(0);

}

System.***out***.println("Please select option: 1:Populate tables , 2: See gpa proportion");

Scanner read = **new** Scanner(System.***in***);

**int** process = read.nextInt();

**int** process2 = 0;

**switch** (process) {

**case** (1): {

System.***out***.println("Please select what table u want to populate: ");

Scanner read2 = **new** Scanner(System.***in***);

**switch** (process2) {

**case**(1): {

System.***out***.println("you selected Student with fields studentID, " + "firstName, lastName, sex enter all inorder ,");

Scanner in1 = **new** Scanner(System.***in***);

Scanner in2 = **new** Scanner(System.***in***);

Scanner in3 = **new** Scanner(System.***in***);

Scanner in4 = **new** Scanner(System.***in***);

System.***out***.println("enter studentid");

String studentd = in1.nextLine();

System.***out***.println("enter firstname");

String usernme = in2.nextLine();

System.***out***.println("enter lastname");

String slastn = in3.nextLine();

System.***out***.println("enter sex");

String sexx = in4.nextLine();

String SQLAdd = "INSERT INTO Student(field1, field2, field3, field4) " + "VALUES ('" + studentd + "', '" + usernme+ "', '" + slastn + "', '" + sexx + "')";

Statement stmt = *c*.createStatement();

stmt.executeUpdate(SQLAdd);

System.***out***.println("record added");

}

**case**(2): {

System.***out***.println("you selected courses with fields (courseID, courseTitle, department )");

Scanner in1 = **new** Scanner(System.***in***);

Scanner in2 = **new** Scanner(System.***in***);

Scanner in3 = **new** Scanner(System.***in***);

Scanner in4 = **new** Scanner(System.***in***);

System.***out***.println("enter studentid");

String courseid = in1.nextLine();

System.***out***.println("enter firstname");

String course = in2.nextLine();

System.***out***.println("enter lastname");

String department = in3.nextLine();

String SQLAdd = "INSERT INTO Courses(field1, field2, field3) " + "VALUES ('" + courseid + "', '" + course+ "', '" + department+ "')";

Statement stmt = *c*.createStatement();

stmt.executeUpdate(SQLAdd);

System.***out***.println("record added");

}

**case**(3): {

System.***out***.println("you selected Classes with fields (classCode, courseID, studentID, year, semester, GPA)");

Scanner in1 = **new** Scanner(System.***in***);

Scanner in2 = **new** Scanner(System.***in***);

Scanner in3 = **new** Scanner(System.***in***);

Scanner in4 = **new** Scanner(System.***in***);

System.***out***.println("enter classCode");

String studentd = in1.nextLine();

System.***out***.println("enter courseID");

String usernme = in2.nextLine();

System.***out***.println("enter studentID");

String slastn = in3.nextLine();

System.***out***.println("enter year");

String yearn = in3.nextLine();

System.***out***.println("enter semester");

String sems = in3.nextLine();

System.***out***.println("enter GPA");

String gpaa= in4.nextLine();

String SQLAdd = "INSERT INTO Student(classCode, courseID, studentID, year, semester, GPA) " + "VALUES ('" + studentd + "', '" + usernme+ "', '" + slastn + "', '" + yearn + "', '" + sems+ "', '" + gpaa+ "')";

Statement stmt = *c*.createStatement();

stmt.executeUpdate(SQLAdd);

System.***out***.println("record added");

}

}

}

**case** (2): {

System.***out***.println("about to create statement");

Statement stmt2 = *c*.createStatement();

String SQLRead = "SELECT classCode,courseID, year, semester,GPA FROM Classes";

System.***out***.println("");

ResultSet rs = stmt2.executeQuery(SQLRead);

// System.out.println("classCode"+"\t"+"courseID");

System.***out***.println("check1");

**while** (rs.next()) {

// int id = rs.getInt("id");

String code = rs.getString("classCode");

String crseid = rs.getString("courseID");

String yearstr = rs.getString("year");

String semesstr = rs.getString("semester");

String GPAstr = rs.getString("GPA");

**if** (code.equals(*codev*) && yearstr.equals("2019") && crseid.equals("211")) {

// System.out.println("we made it " + GPAstr);

**if** (*hash*.containsKey(GPAstr.charAt(0))) {

**int** value = *hash*.get(GPAstr.charAt(0));

*hash*.put(GPAstr.charAt(0), value + 1);

}

}

}

System.***out***.println("check1");/// end of while loop

/\*

\* hash = hash.entrySet() .stream() .sorted(comparingByValue()) .collect(

\* toMap(e -> e.getKey(), e -> e.getValue(), (e1, e2) -> e2,

\* LinkedHashMap::new));

\*/

rs.close();

stmt2.close();

*c*.close();

}

}

System.***out***.println("retured hash");

**return** *hash*;

}/// switch case

/\*public static void main(String[] args) throws SQLException {

connecToDb try1 = new connecToDb();

HashMap<Character, Integer> bash = try1.createconnect();

for (char key : bash.keySet()) {

System.out.println(key + ": " + bash.get(key));

}

}// **TODO** Auto-generated method stub\*/

}

The second part of my project was the piechart class was this class utilizes the piechart class from the previous section and creates a chart. Firstly it a map from the connecttodb class. It then traverses through each values storing the keys and values into arrays form easy manipulation. This is then sorted and the various frequencies of the gpa are stored in an array. The grapgicscontext object is also passed when this is called and its draws a piechart with various sections code below.

package regexdemo;

import java.util.regex.Pattern;

import javafx.scene.canvas.GraphicsContext;

import javafx.scene.shape.ArcType;

import java.util.Random;

import java.util.Scanner;

import java.util.regex.Matcher;

import java.io.BufferedReader;

import java.io.File;

import java.io.FileNotFoundException;

import java.io.IOException;

import java.util.HashMap;

import java.util.LinkedHashMap;

import java.util.Map;

import java.util.Random;

import java.util.Map.Entry;

import java.lang.Math;

import static java.util.stream.Collectors.\*;

import static java.util.Map.Entry.\*;

public class Piechart

{

Random rnd2 = new Random();

MyColor ca2 = MyColor.RED ;

public static Character[] keys = null;

public static Integer[] values = null;

public static frequency f1 = new frequency();

public static Map<Character, Integer> h1 = new HashMap<Character,Integer>();

public static double sum = 0;

public Piechart(Map<Character, Integer> h1) throws FileNotFoundException

{

h1 = f1.freq();

keys = new Character[h1.size()];

values = new Integer[h1.size()];

int index = 0;

for (Entry<Character, Integer> mapEntry : h1.entrySet())

{

keys[index] = mapEntry.getKey();

values[index] = mapEntry.getValue();

index++;

}

for(int i = 0; i<= 25; i++)

{

sum = values[i]+ sum;

}

for(int i = 0; i<= 25; i++)

{

System.out.println("keys: "+ keys[25-i] +" values: "+ values[25-i]);

}

System.out.println("And sum is "+sum);

}

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

/\* public static void main(String[] args) throws FileNotFoundException

{

Piechat();

}\*/

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

public void draw(GraphicsContext g, int frequency)

{

double angle = (frequency/sum)\*360;

g.setFill(ca2.MixColor(rnd2.nextInt(256), rnd2.nextInt(256), rnd2.nextInt(256) ));

g.fillArc(200, 200, 400, 400, 0, angle, ArcType.ROUND);

}

/\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*\*/

public void drawpiechart(GraphicsContext g, int N)

{

g.strokeOval(300, 100, 400, 400);

double anglen = 0;

double angle =0;

for(int i = 0; i< N; i++)

{

angle = 0+angle+anglen;

anglen = (values[25-i]/sum)\*360 ;

System.out.println("strt "+angle + " enda "+ anglen );

int x,y,z;

x=rnd2.nextInt(256);

y = rnd2.nextInt(256);

z = rnd2.nextInt(256);

g.setFill(ca2.MixColor(x,y , z ));

g.fillArc(300, 100, 400, 400, angle, anglen, ArcType.ROUND);

String s = String.valueOf(values[25-i]/sum);

String sm = s+" "+ keys[25-i];

g.fillRect(10, 30\*i+90, 30, 40); g.strokeText(sm, 50, 30\*i+100);

}

}

}

The last part of this project was the javafx class called gpadraw class this class takes extends application and creates a canvas that the piechart will be drawn in after that is passes the canves to the piechart class to draw to final chart on. Code below

**import** java.util.Random;

**import** java.util.Scanner;

**import** java.util.regex.Matcher;

**import** com.db.connecToDb;

**import** javafx.scene.canvas.GraphicsContext;

**import** javafx.scene.shape.ArcType;

**import** java.io.BufferedReader;

**import** java.io.File;

**import** java.io.FileNotFoundException;

**import** java.io.IOException;

**import** java.util.HashMap;

**import** java.util.LinkedHashMap;

**import** java.util.Map;

**import** java.util.Random;

**import** java.util.Map.Entry;

**import** java.lang.Math;

**import** java.sql.SQLException;

**import** **static** java.util.stream.Collectors.\*;

**import** **static** java.util.Map.Entry.\*;

**public** **class** gpadraw {

**static** Random *rnd2* = **new** Random();

**static** MyColor *ca2* = MyColor.***RED***;

**public** **static** Character[] *keys* = **null**;

**public** **static** Integer[] *values* = **null**;

**static** **int** *sum* = 0;

**public** **static** Map<Character, Integer> *h1* = **new** HashMap<Character, Integer>();

**public** **static** **void** getter() **throws** SQLException {

HashMap<Character, Integer> gotmap = **new** HashMap<Character, Integer>();

connecToDb try1 = **new** connecToDb();

gotmap = try1.*createconnect*();

*h1* = gotmap;

}

**public** **static** **void** drawpiechart(GraphicsContext g, **int** N) {

**try** {

gpadraw.*getter*();

} **catch** (SQLException e) {

// **TODO** Auto-generated catch block

e.printStackTrace();

}

*keys* = **new** Character[*h1*.size()];

*values* = **new** Integer[*h1*.size()];

**for** (**char** key : *h1*.keySet()) {

System.***out***.println(key + ": " + *h1*.get(key));

System.***out***.println(*h1*.size());

}

**int** index = 0;

**for** (Entry<Character, Integer> mapEntry : *h1*.entrySet()) {

*keys*[index] = mapEntry.getKey();

*values*[index] = mapEntry.getValue();

index++;

}

**for** (**int** i = 0; i < *h1*.size(); i++) {

*sum* = *values*[i] + *sum*;

}

*h1* = *h1*.entrySet().stream().sorted(*comparingByValue*())

.collect(*toMap*(e -> e.getKey(), e -> e.getValue(), (e1, e2) -> e2, LinkedHashMap::**new**));

**for** (**int** i = 0; i < *h1*.size(); i++) {

System.***out***.println("keys: " + *keys*[i] + " values: " + *values*[i]);

}

System.***out***.println("And sum is " + *sum*);

g.strokeOval(300, 100, 400, 400);

**double** anglen = 0;

**double** angle = 0;

**for** (**int** i = 0; i <*h1*.size() ; i++) {

angle = 0 + angle + anglen;

anglen = ((**double**)(*values*[*h1*.size() - 1 - i]) / *sum*) \* 360;

System.***out***.println("strt " + angle + " enda " + anglen);

**int** x, y, z;

x = *rnd2*.nextInt(256);

y = *rnd2*.nextInt(256);

z = *rnd2*.nextInt(256);

g.setFill(*ca2*.MixColor(x, y, z));

g.fillArc(300, 100, 400, 400, angle, anglen, ArcType.***ROUND***);

String s = String.*valueOf*((**double**)(*values*[*h1*.size() - 1 - i]) / *sum*);

String sm = s + " " + *keys*[*h1*.size() - 1 - i];

g.fillRect(10, 30 \* i + 90, 30, 40);

g.strokeText(sm, 50, 30 \* i + 100);

}

/\*

\* double anglen = 0; double angle =0; for(int i = 0; i< N; i++) { angle =

\* 0+angle+anglen;

\*

\* anglen = (values[25-i]/sum)\*360 ; System.out.println("strt "+angle +

\* " enda "+ anglen ); int x,y,z; x=rnd2.nextInt(256); y = rnd2.nextInt(256); z

\* = rnd2.nextInt(256); g.setFill(ca2.MixColor(x,y , z )); g.fillArc(300, 100,

\* 400, 400, angle, anglen, ArcType.ROUND); String s =

\* String.valueOf(values[25-i]/sum); String sm = s+" "+ keys[25-i];

\* g.fillRect(10, 30\*i+90, 30, 40); g.strokeText(sm, 50, 30\*i+100);

}

}

Sql code

CREATE TABLE "Classes" (

"classCode" TEXT,

"courseID" TEXT,

"year" TEXT,

"studentID" TEXT,

"semester" TEXT,

"GPA" TEXT

)

CREATE TABLE "Courses" (

"field1" INTEGER,

"field2" TEXT,

"field3" TEXT

)

CREATE TABLE "Students" (

"field1" INTEGER,

"field2" TEXT,

"field3" TEXT,

"field4" TEXT

)

"INSERT INTO Student(field1, field2, field3, field4) " + "VALUES ('" + studentd + "', '" + usernme+ "', '" + slastn + "', '" + sexx + "')";

INSERT INTO Courses(field1, field2, field3) " + "VALUES ('" + courseid + "', '" + course+ "', '" + department+ "')";

INSERT INTO Student(classCode, courseID, studentID, year, semester, GPA) " + "VALUES ('" + studentd + "', '" + usernme+ "', '" + slastn + "', '" + yearn + "', '" + sems+ "', '" + gpaa+ "')";

