



UNIVERSITATEA TEHNICĂ
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FACULTATEA DE AUTOMATICĂ ȘI CALCULATOARE

SCHOOL MANAGEMENT SYSTEM

CLASS: OBJECT ORIENTED PROGRAMMING

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SHORT DESCRIPTION

My project is a School Management System application that uses a MySQL database to process information about a school, its students and its staff. It is capable of adding, updating, deleting and showing all of this information that is connected to the database. I made the graphical user interface of the project using JavaFX and a bit of JFoenix (open source java library that implements the Google Material Design). I also used the MySQL Connector/J, that provides connectivity to the database in Java.

There are three standard accounts from which users can log into the application: the 'admin', 'teacher' and 'student' accounts. The first has control over everything and can edit the records in the database, like the school information, teachers' data and students' data. The 'teacher' and 'student' accounts can only view a table with all the school's students organized by their year of study.


PRESENTATION OF USE-CASES

After logging in as 'admin', the user sees the dashboard of the application, with three buttons named "School Information", "Student Management" and "Staff Management"



In the "School Information" section, the administrator can enter new info about the school in the 8 fields of text and then click the "Update" button. This will update the information about the school in the database. The black button with the arrow goes back to the dashboard window.

School Management System

 School Information

Name of School :

Gheorghe Sincai National College

Address :

Sincal Gheorghe 25, Baia Mare

Classes Available :

8

Type of School :

Public day high school

Postal Code :

430311

Date of Establishment :

1919-07-12

School ID No :

12345


Name of Principal :

Leonard Mardar

UPDATE

In the “Student Management” section, the user can register new students (“Student Registration” button) or modify/view the data of the already registered students (“Student Information” button). In the registration section, 6 fields of text and two Radio buttons show up. These can be filled with the new student’s data and then the user can click the “Register” button to send everything to the database. In the “Student Information” section, the user can enter the ID of a student and then click the “Show” button, which will display the data of that particular student. Then, the admin can update the student’s information by modifying the text fields or he can delete the student from the database entirely, by clicking the “Delete” button. The user can also see a table with all of the students enrolled in the school by clicking the “Show all” button. Here, the year of study can be selected from a drop-down list and then the “Show” button can be clicked, which will display the table with the students in that year of study. This section is the only one that can be viewed by all the three main accounts.

School Management System

 Student Registration

Admission Number :

Full Name :

Full Name

Year of study :

Year of Study (5 - 12)

Date of Birth :

YYYY-MM-DD *

Gender :

☒ Male ☐ Female

Contact Number :

Contact Number *


Address :

Address :

RESET

REGISTER

School Management System

 Student Management

Admission Number :

Full Name :

Full Name

Year of study :

Year of Study

Date of Birth :

YYYY/MM/DD

Gender :

Gender

Contact Number :

Contact Number

Address :

Address :

Enter Student ID

SHOW

UPDATE

DELETE

SHOW ALL

[illegible]

Users can sort the data in the table by clicking the column name by which they want to sort (for example, sort alphabetically by clicking the “Full Name” column).

In the “Staff Management” section, the administrator can similarly register new teachers or modify/view data about them. Here, the user can search for staff members by employee number or by name, and then update information about them or delete teachers from the database entirely. A “Show all” button is present here as well, which leads to a window that generates a table with all the staff member’s information.

School Management System

Staff Registration

Employee Number :

Gender :

☒ Male

☐ Female

Teacher's Name :

Contact Number :

Taught Subject :

Address :

Date of Birth :

Email :

RESET

REGISTER

School Management System

<

Staff Management

Search by Employee No

SHOW

Search by Name

SHOW

Employee Number :

Teacher's Name :

Teacher's Name *

Taught Subject :

Taught Subject *

Date of Birth :

YYYY-MM-DD *

Gender :

Gender

Contact Number :

Contact Number *

Address :

Address

Email :

Email

UPDATE

DELETE

SHOW ALL

[illegible]

SOLUTION PRESENTATION

For this project I used the MVC design pattern. I separated the “model” layer into the main model one and the table model one. I did this as well with “controller” – the database controller layer and the main controller layer. “View”, the presentation of the application, contains the .FXML files corresponding to JavaFX. I also used Scene Builder to place the elements of the interface in an easier, more friendly manner.

The “DBConnection” class tries to connect to the MySQL database, while the classes from “dbController” execute queries and INSERT, UPDATE or DELETE operations on the “sms” database. In all of these, we use Getters from the “model” classes to access the information of the school, staff and students and modify the database. “getYears()” in “YearController” also returns an ArrayList of the distinct years of study from the database (the school may not have students at all in a certain year, or it may have multiple students in all years of study). This will be used in a ComboBox in the table of students.

The “School”, “Staff”, “Student”, “StaffTableModel” and “StudentTableModel” classes have as fields the relevant information for each entity, as well as Constructors, Getters and Setters.

The “LoginFormController” class makes sure that only the admin account gets access to the main dashboard of the application, while the teacher and student accounts are directed to the section with the table of students. The last two can only choose a year of study and show the corresponding student data, not being able to press the “Back” button that is available to the admin account. There are also errors for invalid username or password.

The rest of the controller classes describe the functionality of the various buttons in the project. For every add/register, search, delete and update operations I also made alerts that display possible errors. In “ValidationController”, I added some more check methods: one to verify that the text fields in Student and Staff Registration are not left empty, one to verify that only numbers were input (using regex), one to validate phone numbers and one to validate dates.

The MySQL database that I created and connected to the Java application contains 4 tables, with information about the school, staff, students and the user accounts (username and password).

mysql@localhost 2 of 7

mysql

sms

Server Objects

sms@localhost 1 of 7

sms

tables 4

schoolinfo

staff

students

users

Server Objects

schoolinfo [sms@localhost] x console [sms@localhost] x staff [sms@localhost] x students [sms@localhost] x users [sms@localhost] x

10 rows x Tx: Auto DDL

WHERE ORDER BY

	empNo	teacherName	taughtSubject	dob	gender	email	phone	address
1	101	Aysha Hudson	Mathematics	1965-06-17	Female	ayshahud@gmail.com	0783242934	Unirii 85, Cluj-Napoca
2	102	Nicolas Gardner	Programming	1985-10-08	Male	nicgardner@gmail.com	0723765913	Mihai Viteazu 190, Baia Mare
3	103	Katelyn Lester	Biology	1979-09-10	Female	katelester@gmail.com	0711345678	Independentei 63, Brasov
4	104	Alessandra Beck	History	1990-02-02	Female	alessandrabeck@gmail.com	0788123453	Aleea Neptun 90, Cluj-Napoca
5	105	Jimmy Spence	Chemistry	1989-01-01	Male	jimmyspence@gmail.com	0789991233	Aristotel 9, Iasi
6	106	Lisa-Marie Jones	English	1969-03-04	Female	lisamarie@gmail.com	0712812932	Belis 8, Baia Mare
7	107	Lucas Dalton	Physics	1980-04-05	Male	daltonlucas@gmail.com	0792341243	Victor Babes 1, Cluj-Napoca
8	108	Jarod Davison	Geography	1991-03-20	Male	jaroddavid@gmail.com	0745234134	George Bacovia 41, Ploiesti
9	109	Isabell Thomson	German	1982-10-10	Female	isabellthomson@gmail.com	0732823843	Ion Creanga 48, Timisoara
10	110	Michael Stuart	Mathematics	1978-09-29	Male	mikestuart@gmail.com	0739224334	Iuliu Maniu 2, Cluj-Napoca

schoolinfo [sms@localhost] x console [sms@localhost] x staff [sms@localhost] x students [sms@localhost] x users [sms@localhost] x

1 row x Tx: Auto DDL

WHERE ORDER BY

	SchoolName	SchoolAddress	classAvailable	schoolType	postalCode	dateOfEstd	schoolID	name
1	Gheorghe Sincai National College	Sincai Gheorghe 25, Baia Mare	8	Public day high school	430311	1919-07-12	12345	Leonard

