

Courses Selection System

Usage guideline

2023.12.7

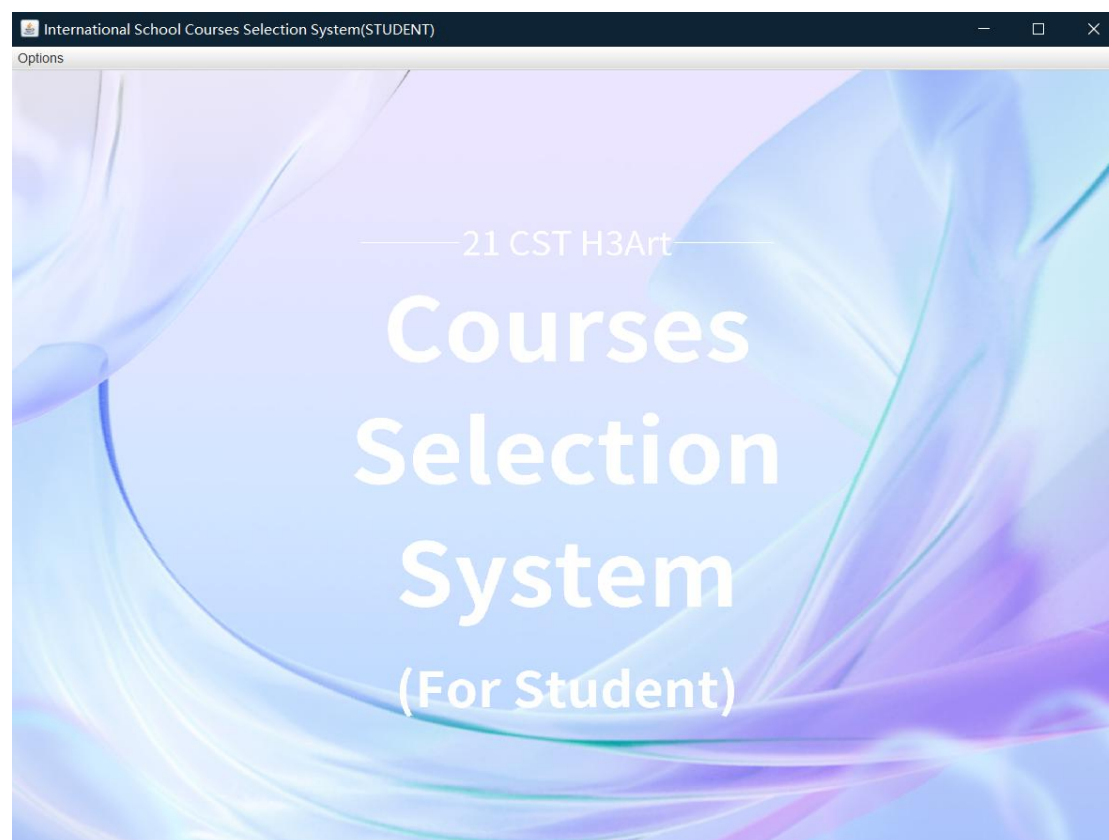
H3Art

1. Introduction

This system develops a database-driven partial application system for Teaching Administration Management, primarily focusing on Course Enrollment functionalities, including essential support features like viewing available and enrolled courses, and modifying course selections. It adheres to key constraints such as prerequisite course requirements, a credit cap (maximum of 21 credits per semester), and the avoidance of scheduling conflicts among selected courses.

This system is built using Java, JDBC and swing framework. It also develops two different main interfaces for students and administrators and implements their corresponding functions respectively.

For Students, this system provides a comprehensive suite of functionalities tailored to enhance their academic experience. Students can securely modify their own passwords, ensuring personal data protection. They have access to view their personal information, allowing them to keep track of their academic records and personal details. The system enables students to select courses, providing a streamlined process for course enrollment. Additionally, students can also view the courses they have enrolled in, and if necessary, they have the option to quit courses, granting them flexibility in managing their academic workload.



For Administrators, the system offers a robust management platform to oversee course and student administration. Administrators have the capability to modify course information, which is essential for keeping course offerings up-to-date and relevant. They can add new courses to the system, allowing for the expansion and adaptation of the academic curriculum. Furthermore, administrators can view all student information, aiding in the oversight and support of student progress. They also have the ability to modify student passwords, providing support for account management and security.



2. System Build

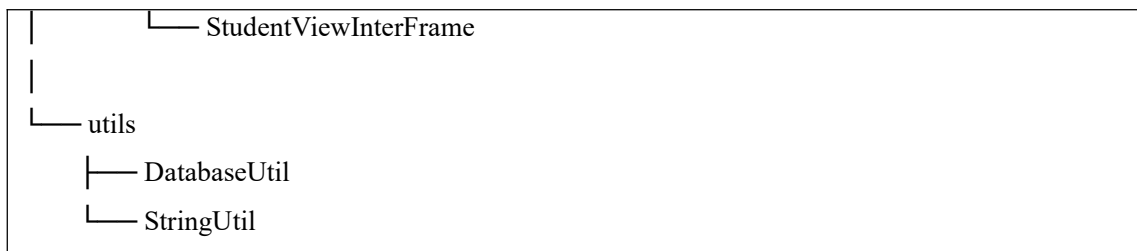
This system is built based on **Java 1.8** version and requires the jar package of **mysql-connector** as an external library file to connect to the **MySQL** database. I completed the entire system in IDE **IntelliJ IDEA**.

In this system, the **doc** folder stores usage guideline, the **lib** folder stores **mysql-connector**, the **res** folder stores resource images and database backup files, the compiled executable Java class files are stored in the **run** folder, and finally the **src** folder saves the source code, which is classified into different software packages. The system file structure is shown as follows:

```
Courses_Selection_System
```

```
|
|— doc
```

```
|   └─ usage_guideline
|
|   └─ lib
|       └─ mysql-connector-java-8.0.33.jar
|
|
|   └─ res
|       └─ CoursesSelectionDB_bak.sql
|       └─ CoursesSelectionSystemBackground_BLK.png
|       └─ CoursesSelectionSystemBackground_WHITE.png
|
|
|   └─ run
|
|
|   └─ src
|       └─ dataAccess
|           └─ CourseDataAccessObject
|           └─ LoginDataAccessObject
|           └─ SelectionDataAccessObject
|           └─ StudentDataAccessObject
|
|       └─ dataModel
|           └─ AdminAccount
|           └─ Course
|           └─ Selection
|           └─ StudentAccount
|           └─ StudentInfo
|
|       └─ gui
|           └─ AdminMainFrame
|           └─ BackgroundDesktopPane
|           └─ CourseAddInterFrame
|           └─ CourseManageInterFrame
|           └─ CourseViewInterFrame
|           └─ LoginFrame
|           └─ PasswordModifyInterFrame
|           └─ SelectCourseInterFrame
|           └─ SelectedViewInterFrame
|           └─ SelfInfoInterFrame
|           └─ StudentMainFrame
|           └─ StudentPasswordInterFrame
```

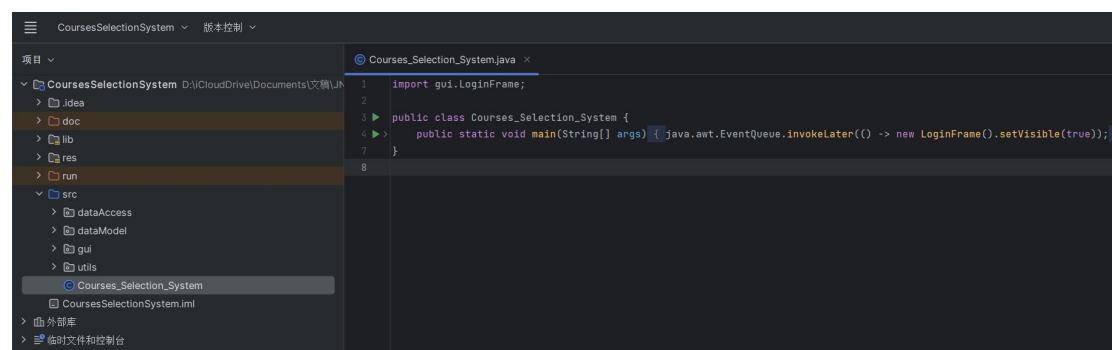


When you start building the content of this system, you need to create a database named **CoursesSelectionDB**, restore the database content using the **CoursesSelectionDB_bak.sql** I have created in the res folder, and then modify **src/utils/DatabaseUtil.java** to enable the Connection class to connect to your database.

```

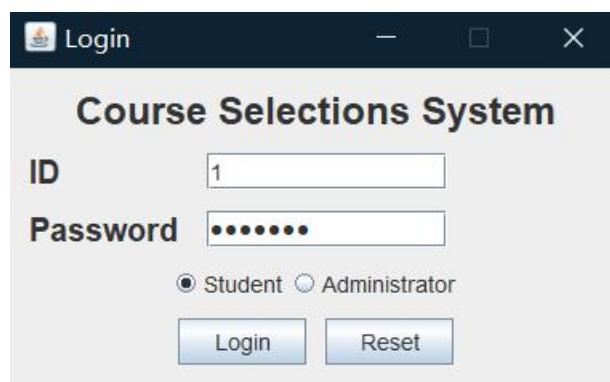
1 package utils;
2
3 import java.sql.Connection;
4 import java.sql.DriverManager;
5
6 public class DatabaseUtil {
7
8     //set up the connection to the database
9     public Connection getConnection() throws Exception {
10         Class.forName("com.mysql.cj.jdbc.Driver");
11         String dbPassword = "Your password";
12         String dbUserName = "Your username";
13         String dbUrl = "Your Database url";
14         return DriverManager.getConnection(dbUrl, dbUserName, dbPassword);
15     }
16
17     //close the connection
18     public void closeCon(Connection con) throws Exception {
19         if (con != null) {
20             con.close();
21         }
22     }
23 }
  
```

Finally, run the **Courses_Selection_System.java** file in IDEA and the system is successfully built.

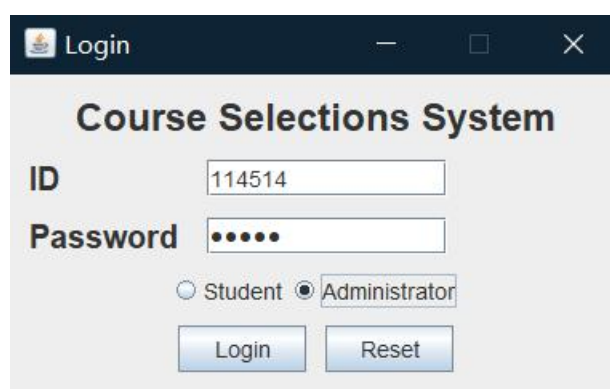


3. System Access

At the first moment you start the Course Selection System, you will see the login page of the system, where you can choose to enter the system as a student or administrator. The two identities correspond to different account and passwords, and they will not access the same database table entry. Here, the administrator has only one account, the account number is **114514**, and the password is **admin**.

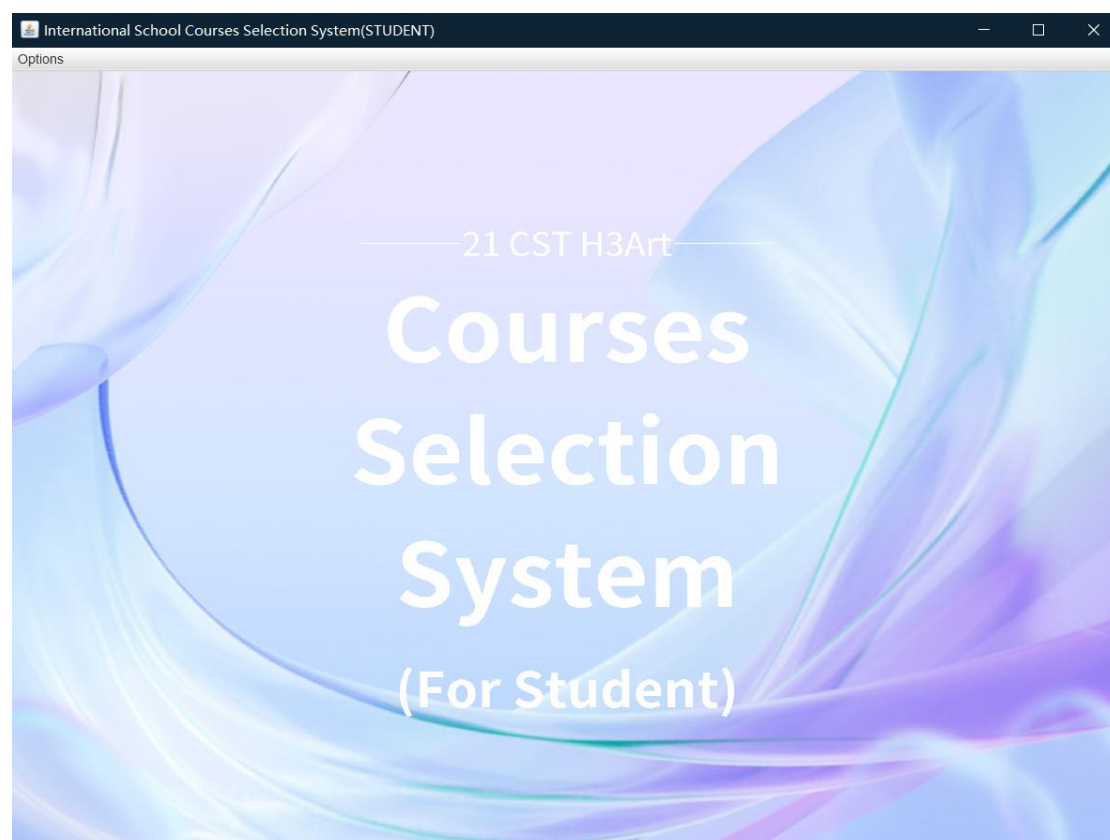
A screenshot of a web browser window titled "Login". The page content is titled "Course Selections System". It features two input fields: "ID" with the value "1" and "Password" with masked characters ".....". Below these fields are two radio buttons: "Student" (which is selected) and "Administrator". At the bottom are two buttons: "Login" and "Reset".

Log in with a student account

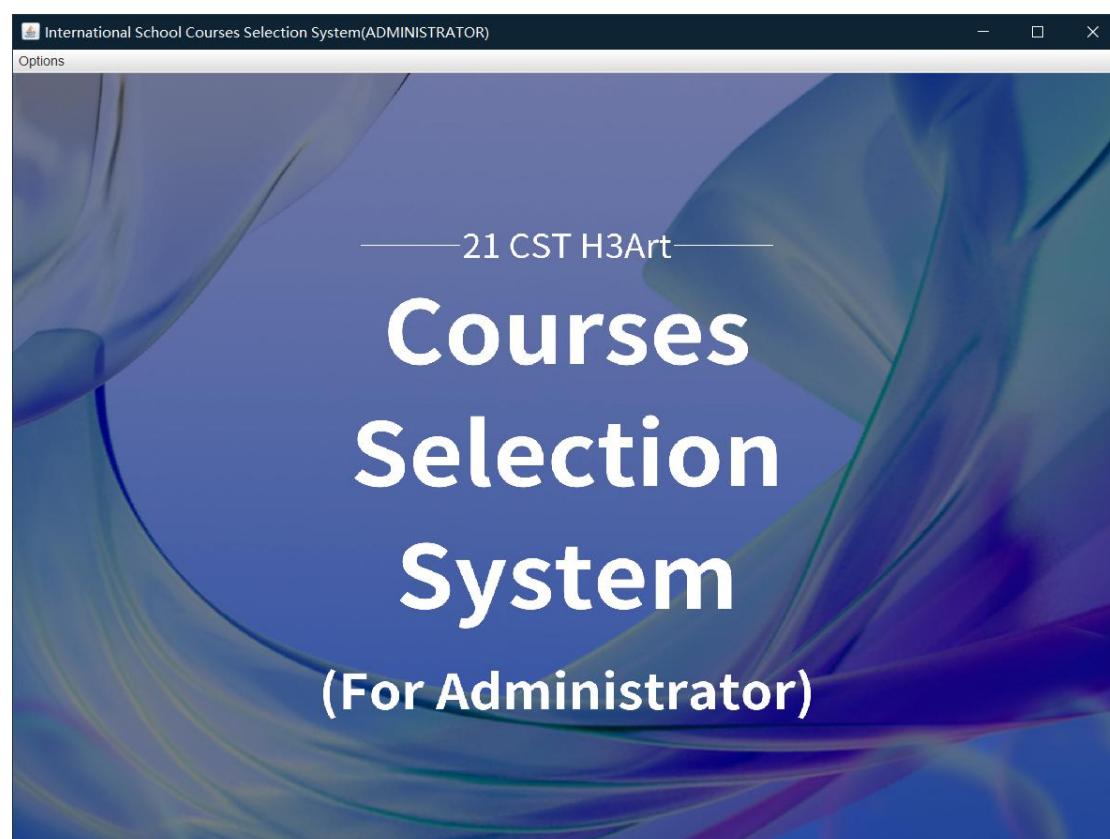
A screenshot of a web browser window titled "Login". The page content is titled "Course Selections System". It features two input fields: "ID" with the value "114514" and "Password" with masked characters ".....". Below these fields are two radio buttons: "Student" and "Administrator" (which is selected). At the bottom are two buttons: "Login" and "Reset".

Log in with administrator account

When you log in successfully, you will see different interfaces. The student account interface is as shown in the figure:

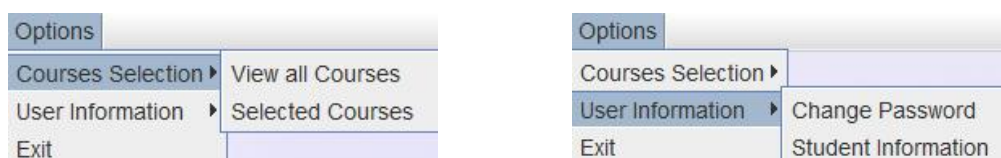


The administrator account interface is as shown in the figure:



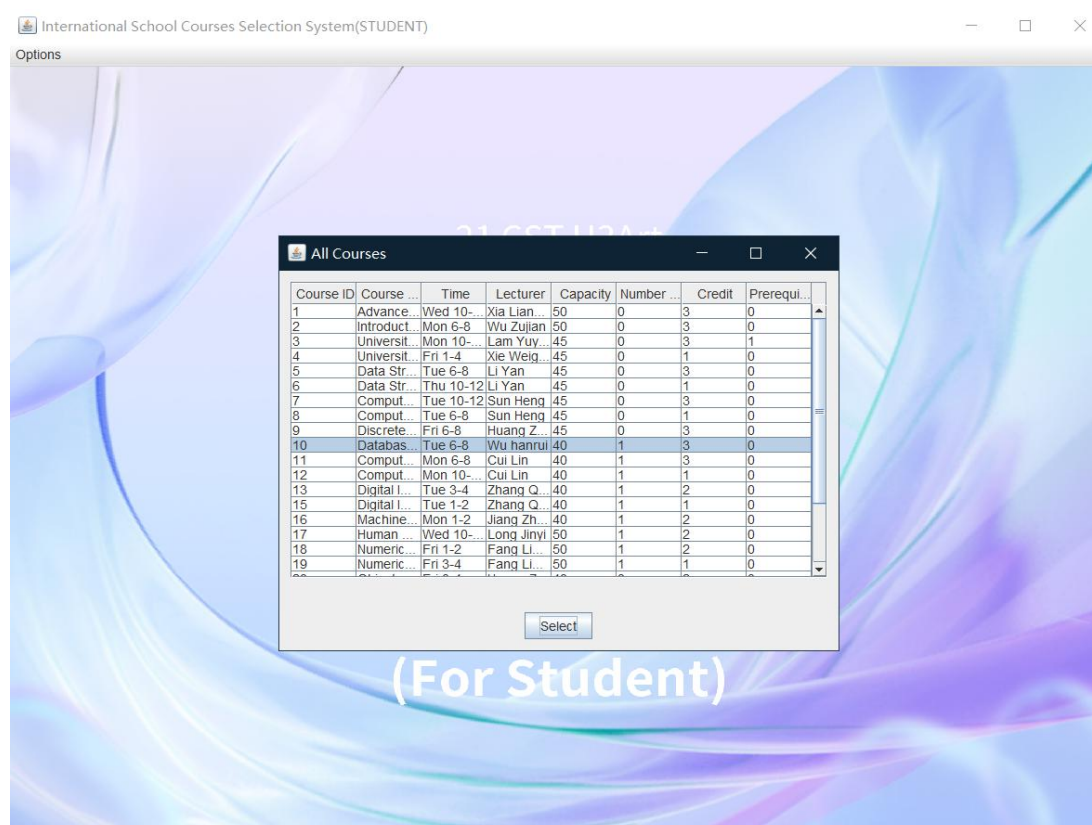
4. Student Operation

In the student account operation interface, the system provides functions such as **viewing all courses**, **viewing selected courses**, **viewing the student's personal information** and **changing the login password** of the student account.

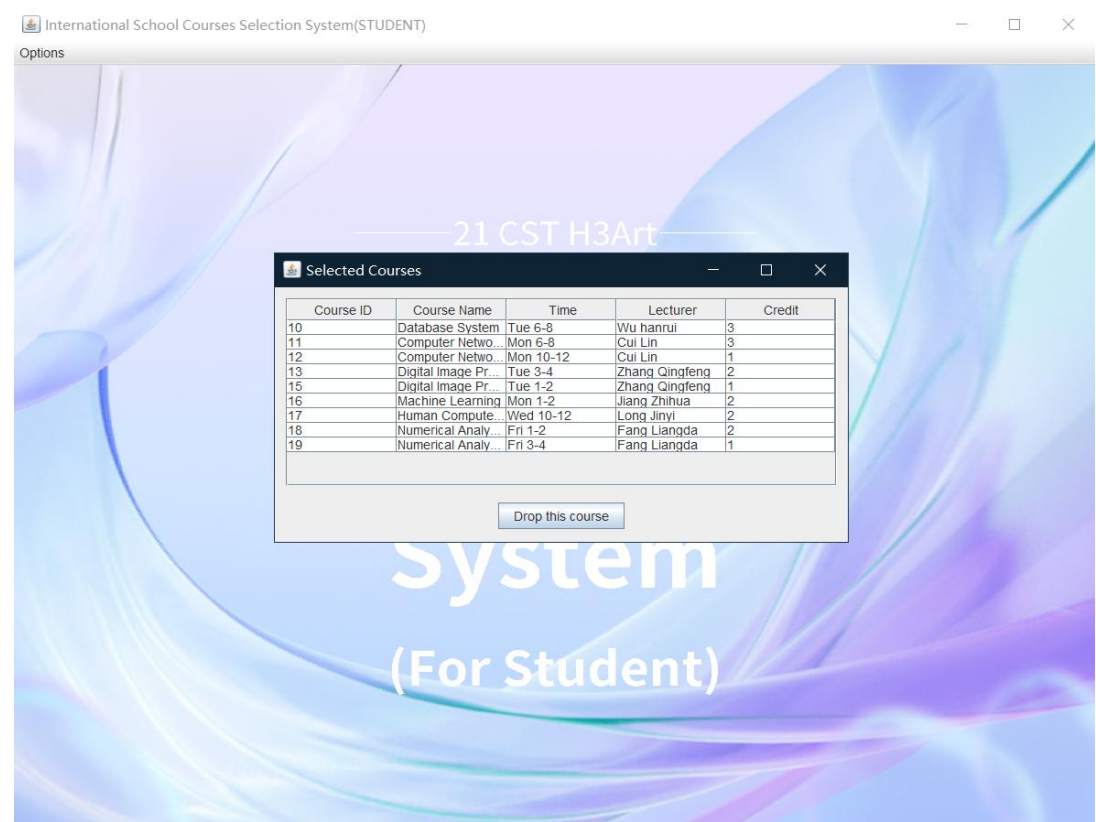


Main functions of student account

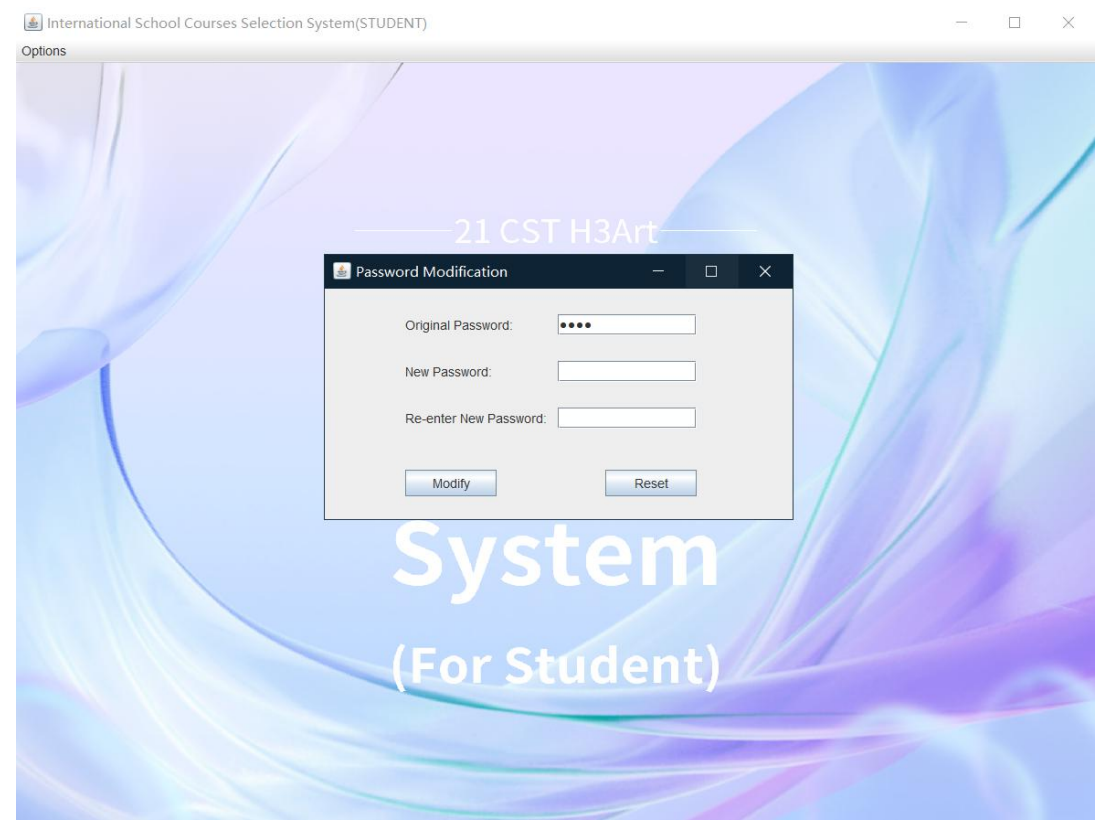
In the view all courses function, students can view all courses and add course selections. The system will judge the students' course selection status. If the current selected course overlap with the selected courses, the prerequisite courses are not met, or the course capacity is insufficient, etc. , the system will prohibit students from choosing this course.



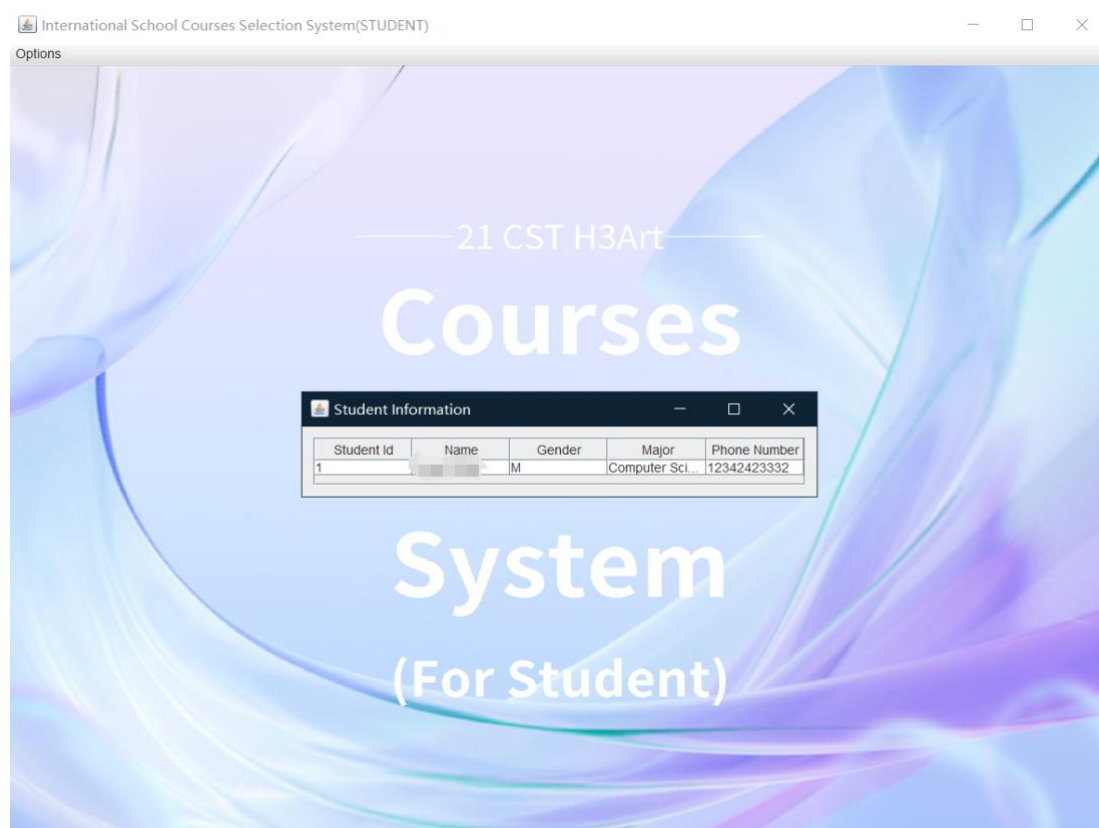
In the function of viewing selected courses, students can see the courses they have selected. The only operation that can be actively performed is to unsubscribe from a selected course.



In the password change function, students need to verify their original password and enter the new password twice to complete the change of the password for this account.

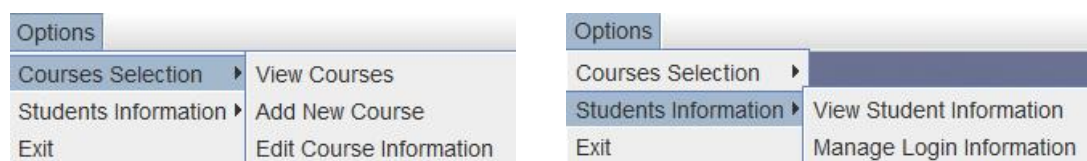


In the function of viewing student personal information, you can see the student ID, name, gender, major and mobile phone number information of the corresponding student under this student account.



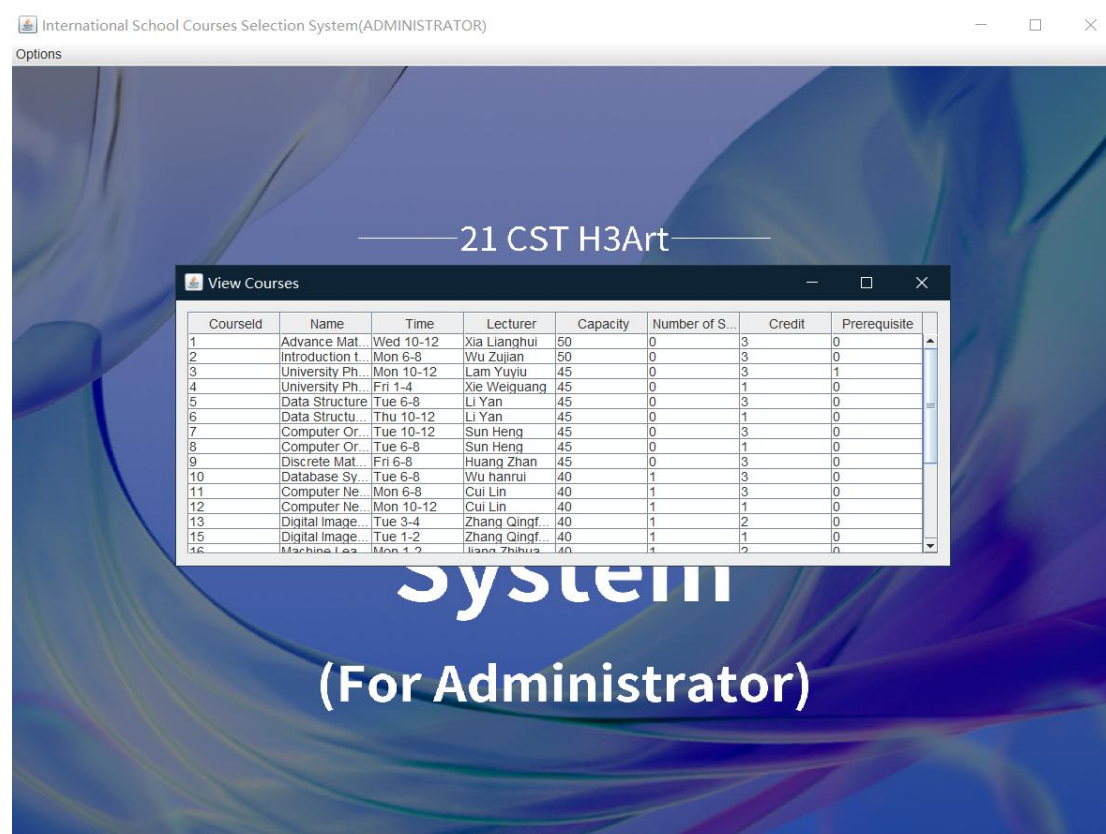
5. Administrator Operations

In the administrator account operation interface, the five main functions provided by this system include **viewing all courses**, **adding new courses**, **editing course information**, **viewing all student information**, and **managing student login information**.

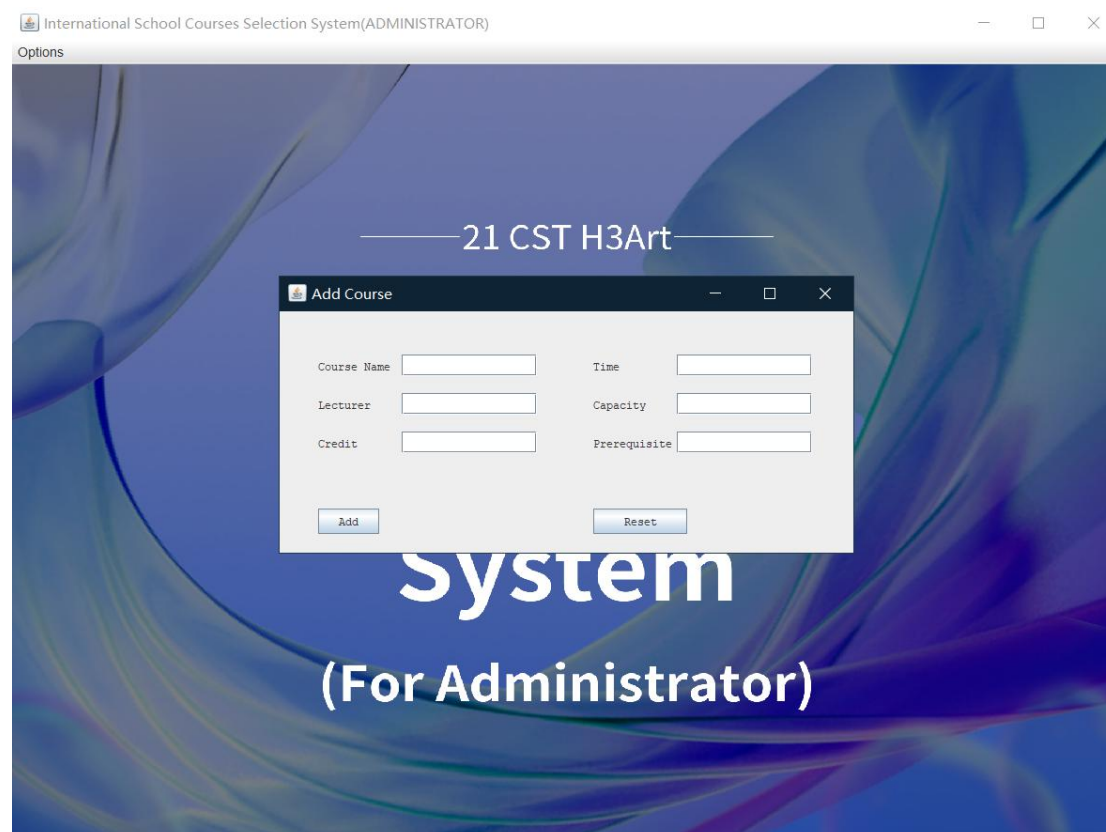


Main functions of administrator account

In the view all courses function, administrators are not provided with the ability to select courses. Administrators on this page cannot perform any operations. Administrator can only view course information, including course number, course ID, course time, lecturer, course capacity, and selected number, course credit requirements and prerequisite course requirements.



In the add course function, except for the course ID and selected number fields that do not need to be set, other course information fields need to be filled in. After completing the filling, click the **Add** option to add the course to the database.



The design of the edit course function is relatively complex. It provides a search function for courses. You can easily use the course name, speaker and course time fields to find courses. After selecting the course you want to edit, you need to fill in the necessary fields as you did before adding the course function. 6 fields to complete the modification of course information.

Edit Course Information

Search Criteria

Course Name Lecturer Time

Course Id	Name	Time	Lecturer	Capacity	Number of Selected	Credit	Prerequisite
1	Advance Mathematics I	Wed 10-12	Xia Lianghui	50	0	3	0
2	Introduction to Comp.	Mon 6-8	Wu Zujian	50	0	3	0
3	University Physics	Mon 10-12	Lam Yuyiu	45	0	3	1
4	University Physics Lab	Fri 1-4	Xie Wei-quang	45	0	1	0
5	Data Structure	Tue 6-8	Li Yan	45	0	3	0
6	Data Structure Lab	Thu 10-12	Li Yan	45	0	1	0
7	Computer Organizati...	Tue 10-12	Sun Heng	45	0	3	0
8	Computer Organizati...	Tue 6-8	Sun Heng	45	0	1	0
9	Discrete Mathematics II	Fri 6-8	Huang Zhan	45	0	3	0

Form Action

Course Id Course Name Time Lecturer

Capacity Number of Selected Credit Prerequisite

Next is the function of viewing students' personal information. It provides the ability to view the personal information of all students entered in the database (including the student's ID, name, gender, major and phone number). It also supports querying based on student ID and name.

View Student Information

Search Criteria

Student ID Student Name

Student ID	Name	Gender	Major	Phone Number
1		M	Computer Science	12342423332
2		M	Network Engineering	15523542134
3		F	Internet Finance	13412342112

(For Administrator)

The last function provided is the function of modifying the student account login information. In this interface, administrator can search for students by student ID and modify the password of the student account.

