6.3D – Custom Program

Design Overview for Student Attendance System

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Summary of Program

The "Student Attendance System" is a tool for organizing student data and managing the attendance process. The MySQL database will be used to hold student data such as personal information, class information, and attendance statistics. Users can access administrative functions like saving details and attendance time after logging in to connect to the database. In order to build an interface through which users can alter information by filling out forms and clicking on buttons, window forms are also used

The Student Attendance System project demonstrates the principles of object-oriented programming:

1. Encapsulation:
The code uses classes to encapsulate related data and methods. Each form (`LoginForm`, `MainForm`, and `StudentRegistrationForm`) encapsulates the behavior and UI elements related to its specific functionality. The MySqlConnection object (`con`) is kept private within each form, encapsulating the database connection details.

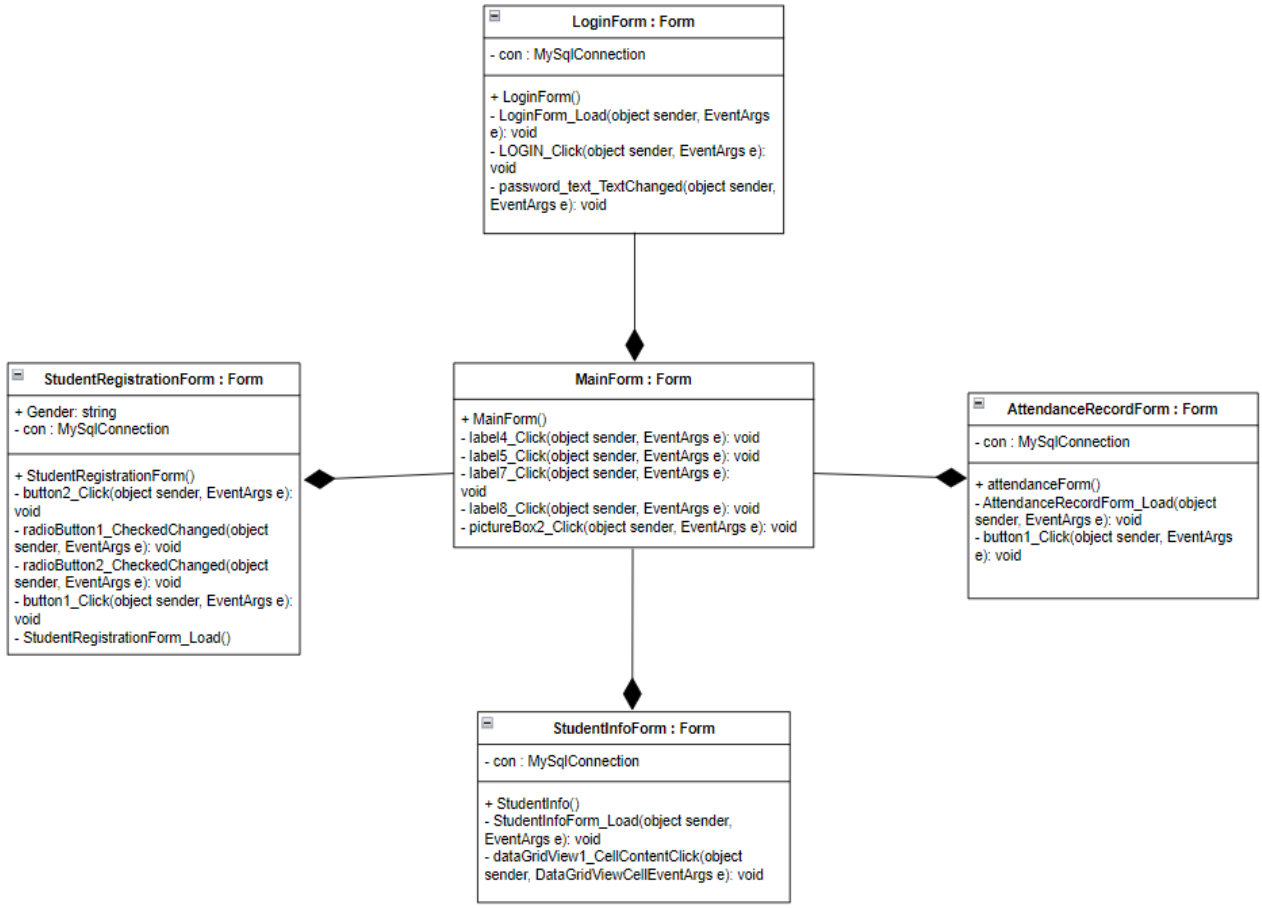
2. Inheritance:
The `LoginForm`, `MainForm`, and `StudentRegistrationForm` classes inherit from the `Form` class, which provides common functionality for windows forms in Windows Forms applications. By inheriting from the `Form` class, these classes inherit attributes and methods like `InitializeComponent()` and event handling mechanisms.

3. Polymorphism:
Polymorphism is not explicitly demonstrated in the system.

4. Abstraction:
Abstraction is the process of simplifying complex functionality into a more manageable and understandable form. In the code, complex operations like generating QR codes, inserting data into the database, and image handling are abstracted into separate methods (`button2_Click`, `button1_Click`). The behavior of these methods is abstracted away from the main logic, allowing for a clearer and more focused understanding of the code.

Class Structure

Below is the final design for the system:



The classes that were developed within the system are:

1. LoginForm class:

- That handles user authentication. It has private fields, UI elements, and event handlers for login functionality
- After the user logs into the account, a connection is also established to the database. The user can only access the MainForm class after successfully connecting to the database.

2. MainForm class:

- Represents the main functionality of the application. It contains private fields, UI elements, and event handlers for the main functionality.
- Is responsible for dipsplaying functions of the system including update or display attendance records and students' information.

3. AttendanceRecordForm class:

- Displays and prints attendance records. The data will print in PDF format and be accessible across browser tabs.
- The class development process also includes an external file called "DGVPrinter" at the same time. It features exclusive private fields, attributes, and methods designed just for printing DataGridViews.

4. StudentRegistrationForm class:

- Some information, including names, addresses, and attending times, will be kept in a database used to track student attendance. Each student will also be given a qr code,

which will vary each time information is submitted to prevent confusion with earlier entries.

5. StudentInfoForm class:

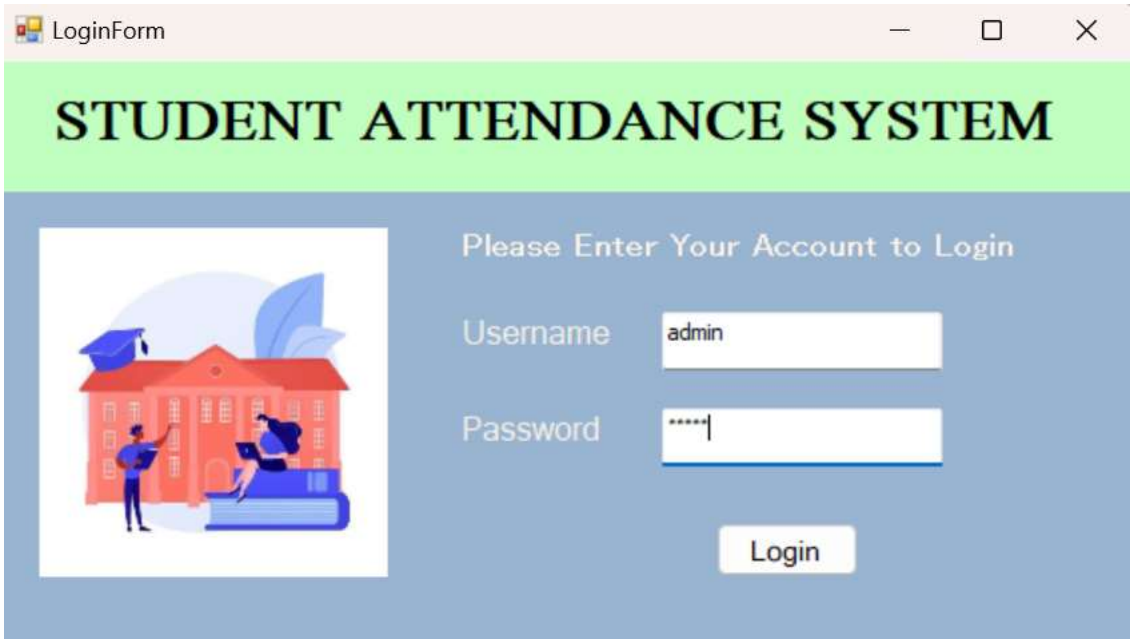
- Responsible for displaying information about students. The Gridfield contains a list of student information, and clicking on a particular student's information will enlarge it on the top half of the screen.

6. Program class:

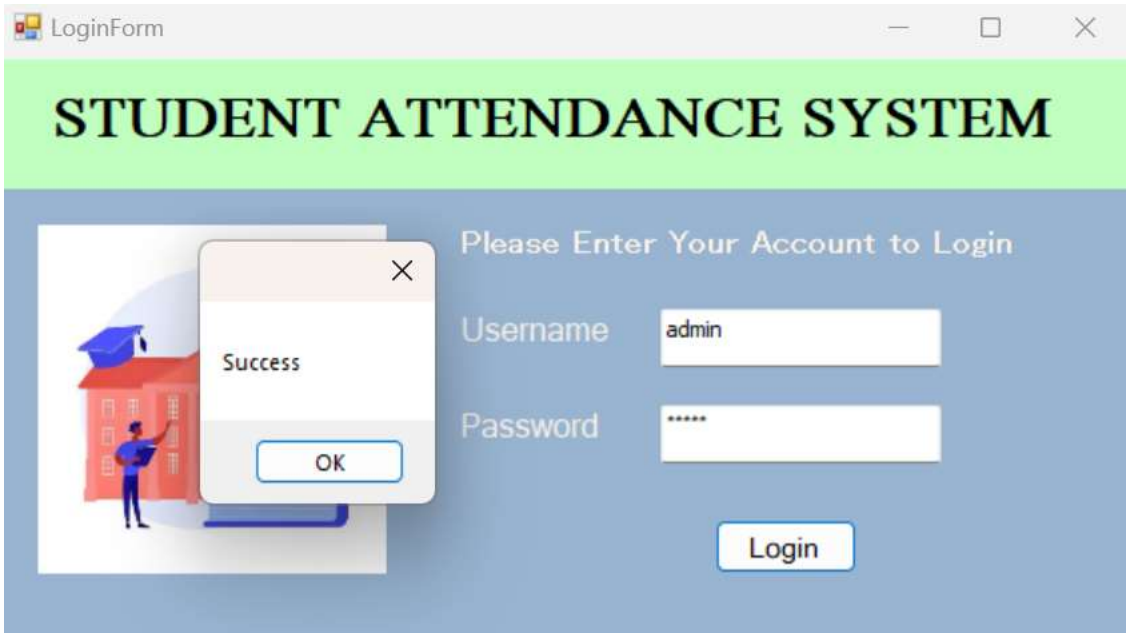
- The main entry point for the application
- Reponsible for calling the Login Form.

Program Execution

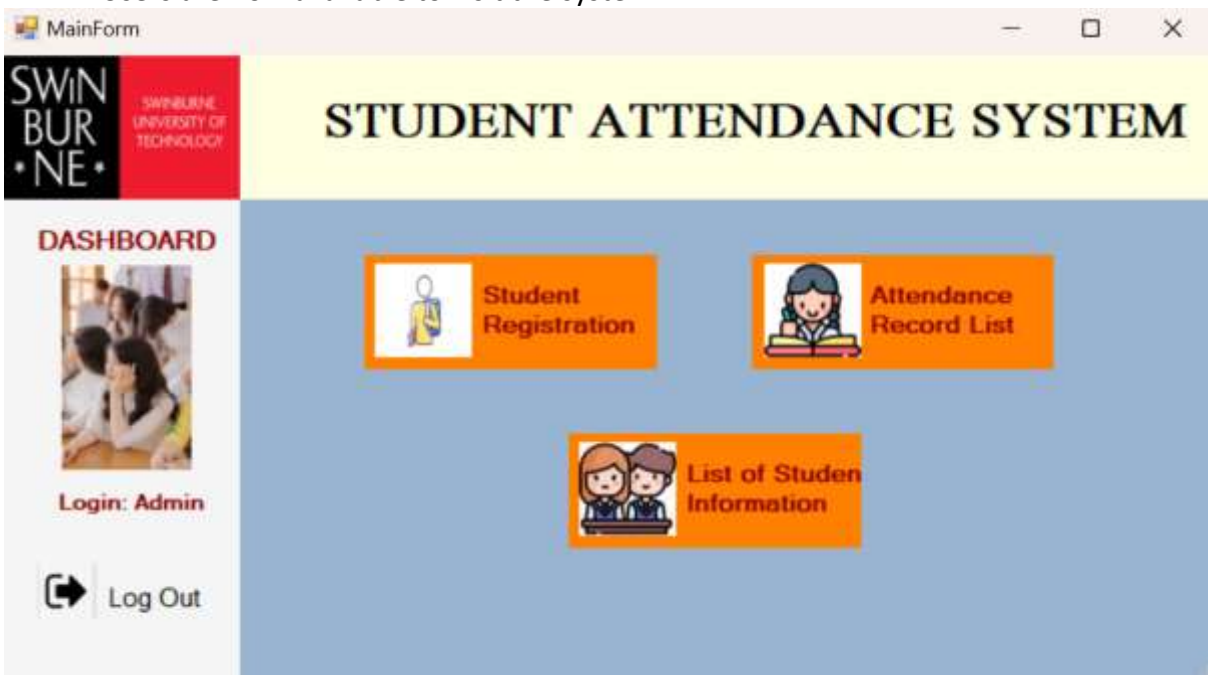
- Upon running the program, the Login Form appears and requires users enter their account.



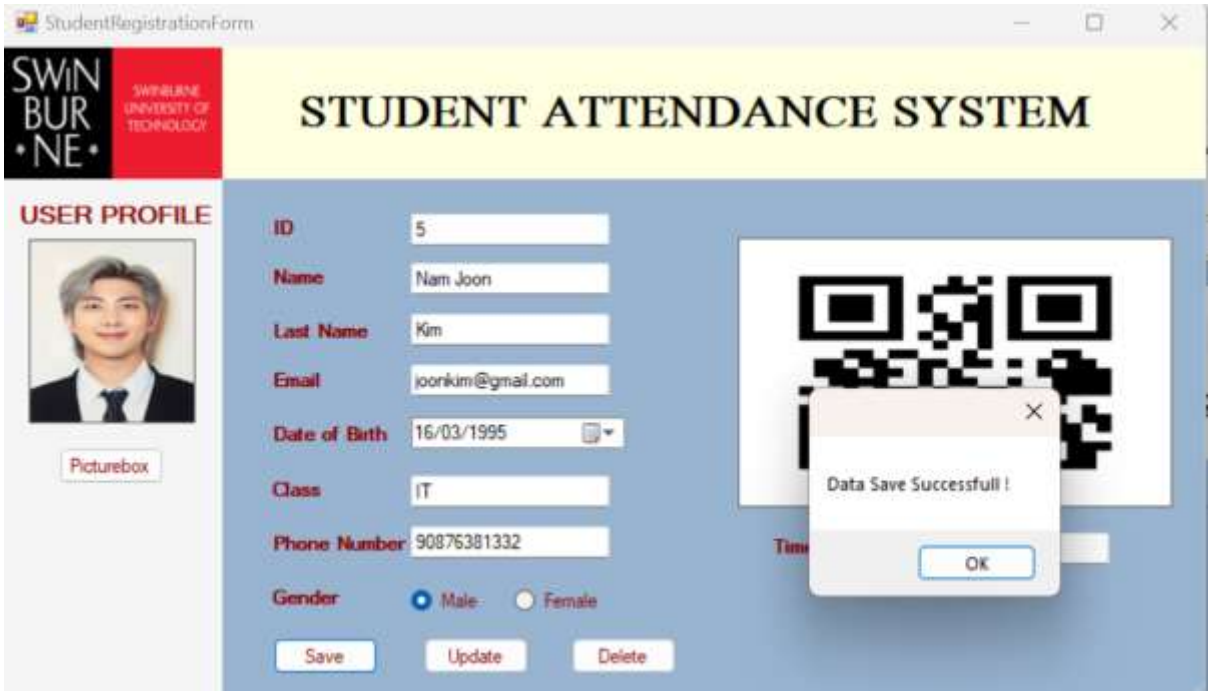
- After entering correct account, a message box appear and database is connected successfully



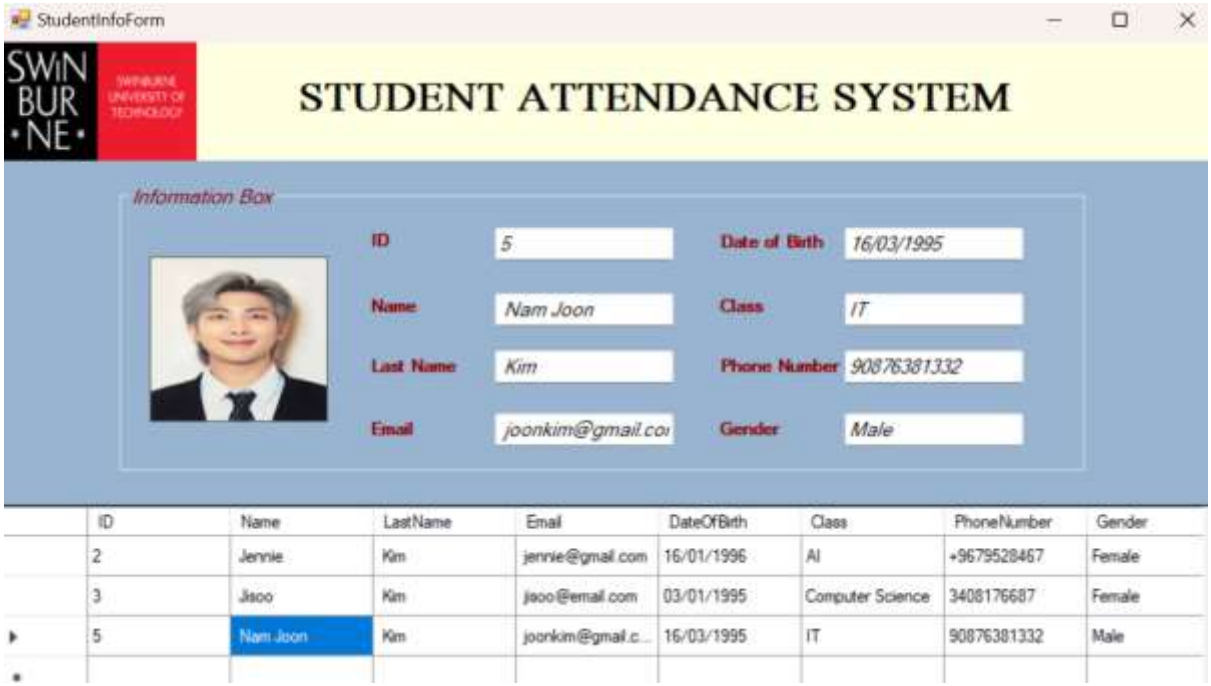
- Users are now available to visit the system



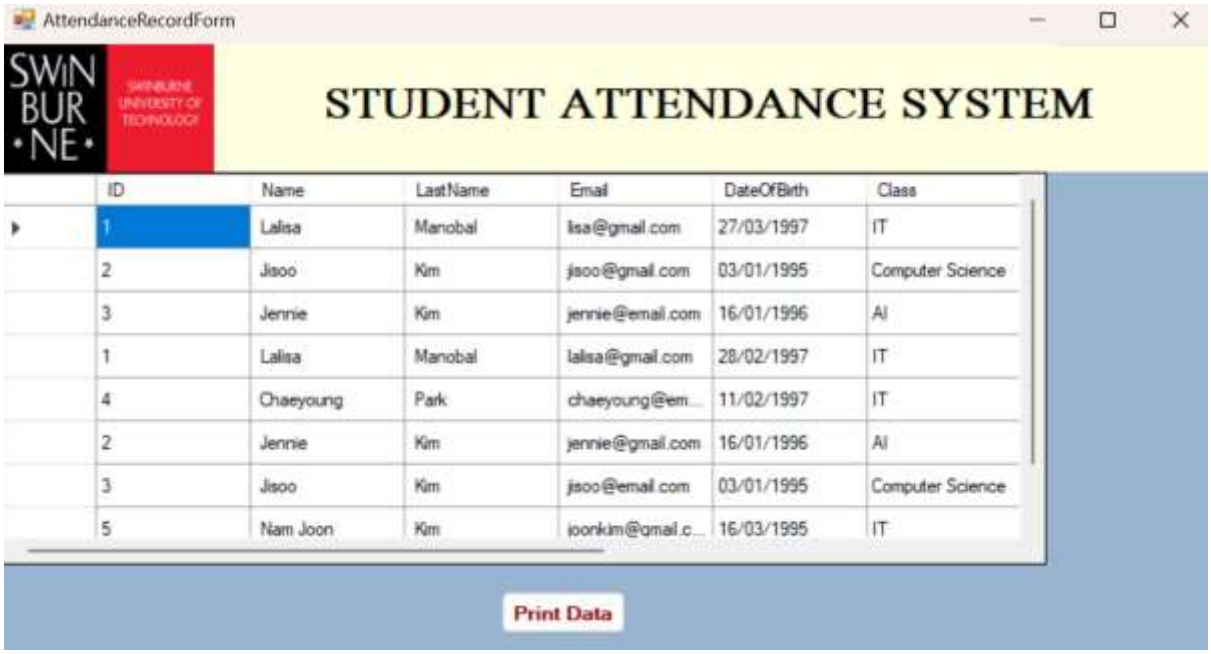
- **MainForm:** will appear immediately and displays system's functions



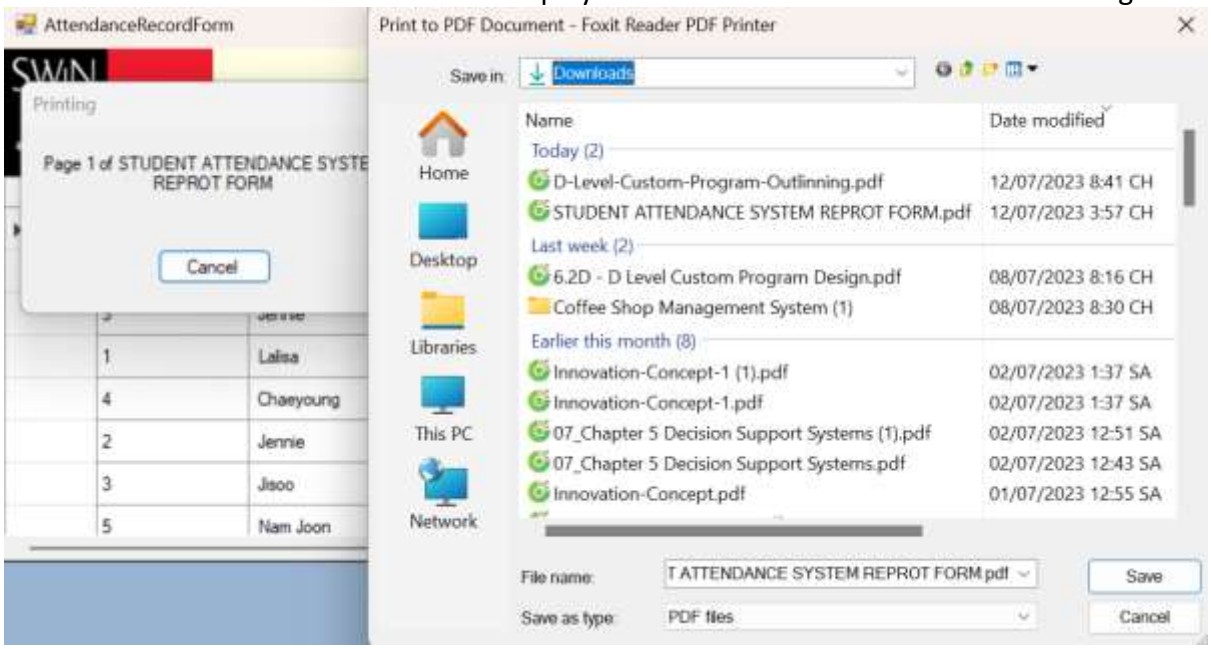
- **Student Registration Form:** collect the student information and attending time then generate a corresponding QR code

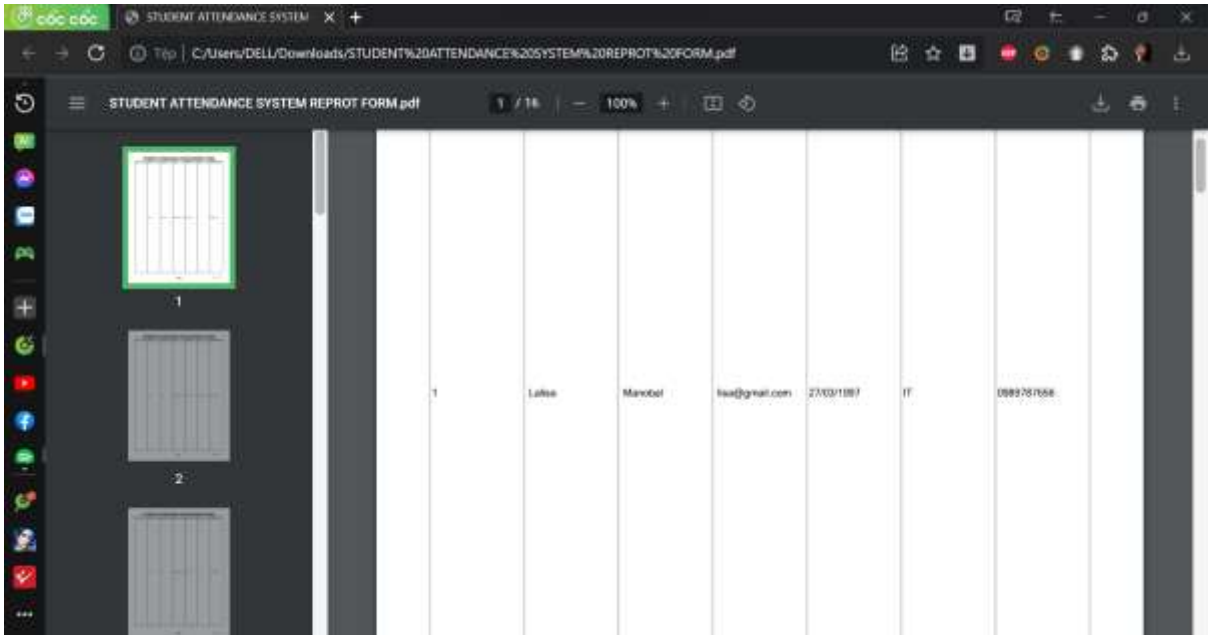


- **List of Student Information Form:** will display a list of student information, the details will present if one of them is selected



- **Attendance Record List Form:** Displays both student information and attending time





- If **PrintData button** is selected, a file will be exported and available to see