COMPS350F Software Engineering

Student Information Management System
Testing Plan Report

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Table of Content

System Overview

The School of Science and Technology plans to establish a system to provide teachers and students with convenient academic record management tools. We are to create a student information management system for this project. This system will improve the efficiency and accuracy of information management for the school.

Student Information Management System is a Python program system which can record student personal profile and academic records. This system is a computer application that is applied for all personal computers with desktop. Users can download the system and run it on any platform that can run Python programs. This system can be provided for three roles of users to use, who are Administrators, Teachers, and Students. Different roles of users will be redirected to different versions of the pages and can use corresponding functions.

Developing Test

Student Information Management System is a critical application for managing student information and academic records. Through testing, we will verify whether the various functions of the system are functioning properly, while also discovering and fixing potential errors and defects.

1. **Test objectives**

   When developing the student information system, we set the following testing goals:

   i. Ensure student data is stored and retrieved correctly.
   ii. Test the system's performance and stability when multiple users access it simultaneously.
   iii. Ensure that the system correctly handles various user input situations, such as incorrect input or invalid requests.
   iv. Verify that the system accurately calculates and displays students' course grades.

2. **Test strategy**

   In order to achieve the above goals, we adopted the following testing strategy:

   A. Unit tests: For the storage and retrieval functions of student materials, we have designed a series of unit tests to verify the correctness and completeness of these functions.
   B. Integration testing: By simulating actual usage scenarios, we test the system ‘s integration between multiple modules to ensure that each module can work together correctly.
   C. Interface testing: Test the interface between the system and external systems or services to ensure the accurate transmission and integration of data.

3. **Test cases**

   Test case 1*: Verify the storage and retrieval functions of student information.*

   ✧ Steps: Add a new student information, and then retrieve the student’s information.
   ➢ Expected results: The retrieved student information is consistent with the newly added information.

Test case 2: *Test the performance and stability of the system when multiple users access it at the same time.*

- ✧ Steps: Simulate multiple users accessing the system at the same time to perform various operations, such as adding, modifying or querying student information.
- ➢ Expected results: The system can operate normally without exceptions or crashes.

Test case 3: *Test the system 's handling of invalid or incorrect input.*

- ✧ Step: Attempt data retrieval using an invalid student number.
- ➢ Expected results: The system returns an error message, prompting the user to enter a valid student number.

In summary, through the above testing strategies and test cases, we successfully verified the functionality, quality and stability of the student information system. We found and fixed several potential bugs and flaws to ensure the system functions properly in real-world use. However, testing is an ongoing process, and we recommend continuing testing in subsequent versions of the system to ensure the long-term performance and quality of the system.

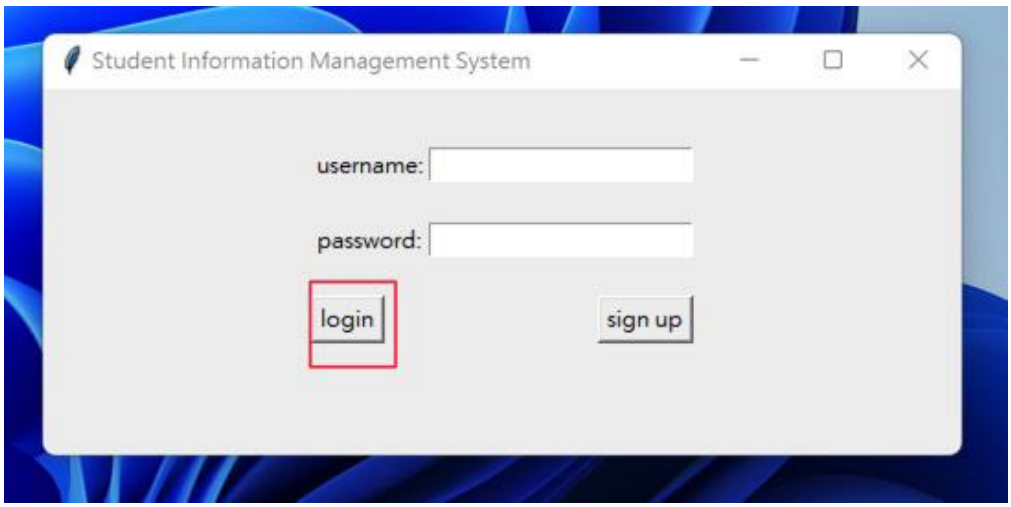
Validation Testing

The validation testing of student information management system is mainly used to communicate processing results to users. These tests are also used to provide actual test results for future reference for improvements. Computer output is the most important and direct source of information for users as our system is for personal computer users. Design validation testing should be organized throughout the process to make the system user-friendly. Validation tests are also defined during the functional logic design phase. Therefore, during testing, the system will display layout types, formats, responses, etc. that connect various user applications.All roles of users' screens provide linked information and interaction so that system functions can fully meet the request of our clients.

User guide video about how to download and run the system: https://mailouhkedu-my.sharepoint.com/:v:/g/personal/s1336033_live_hkmu_edu_hk/EflnczvhAclAondfyOtIwZQB9yq3hzOtUVYTEJbZE0p4Mw

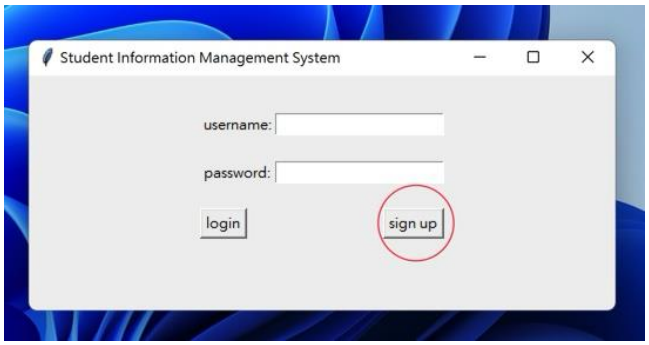
Here are five functions that passed validation testing:

1. **Login account system**

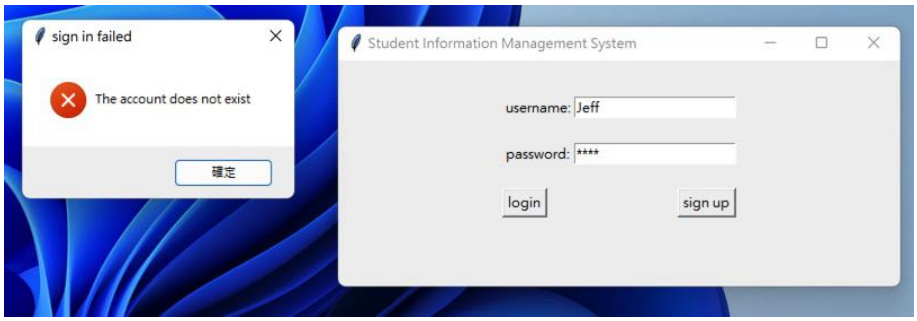


Each time when users start running the student information management system program, the system will first pop up the Login page. Users then need to log in for identity verification and classifying their roles. Users with different groups will enter different versions of the homepage. Users must input their username and password then click the Login button to complete the verification.

2. Sign up a new account (For student):



Students who are using this system for the first time will have to sign up for a new account for themselves. After running the system to login page, click sign up button will lead students to sign up their new account.

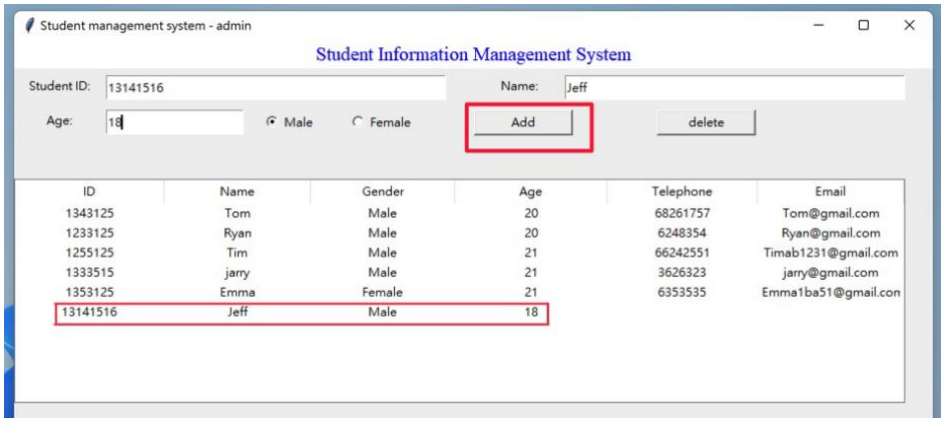


When unregistered data is entered and login is pressed, the system will detect an abnormality and block the input data. A prompt window will pop up showing "The account does not exist". This is a reminder that the user needs to register.

After users press the sign up button, they will enter the sign up page. Enter username, password and confirm password again. After pressing register button, a new student account will be registered. Then, students can login the account for viewing academic sources.

3. Administrator's Function

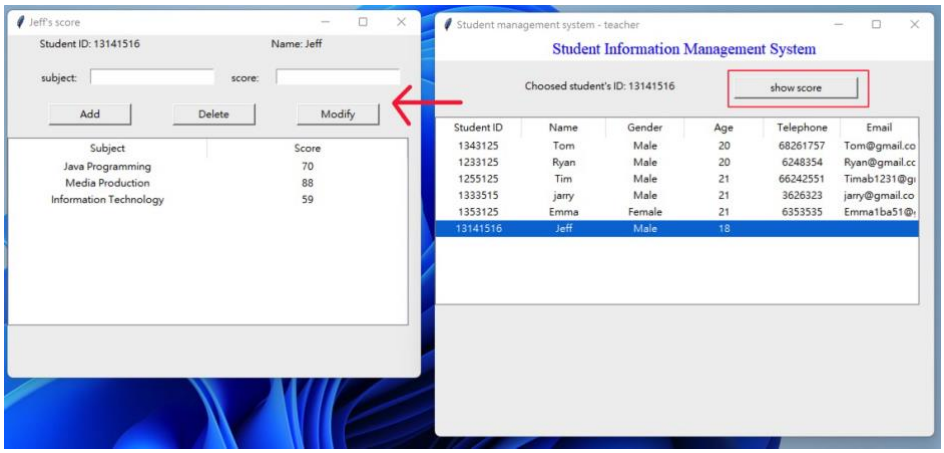
The role of administrator can view and modify basic student information.



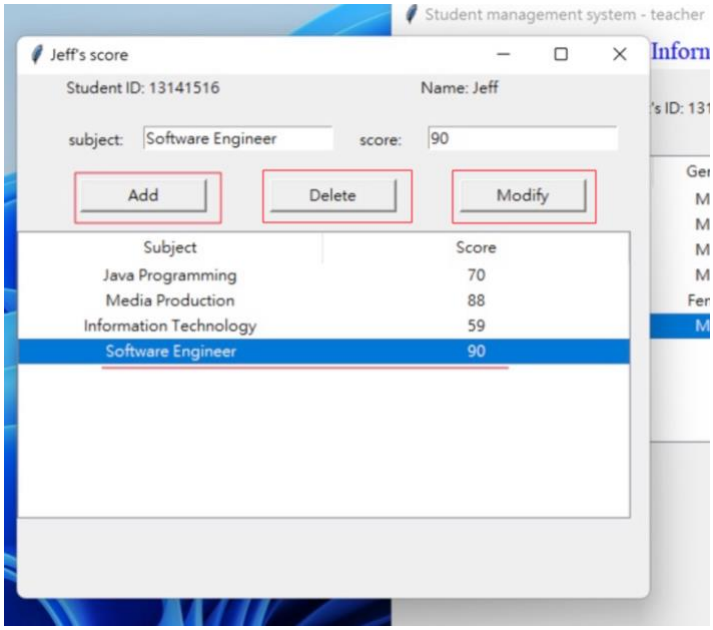
Administrators have the authority to enter student **basic** information. The admin can add, delete and modify inputs of new students' information, including Name, Student ID, Age, Gender into the student information management system. All student's data will be saved on admin user's homepage. Only student information stored on the admin homepage can successfully register an account.

4. Teacher's Function

The role of teacher can view, upload and modify student academic scores.



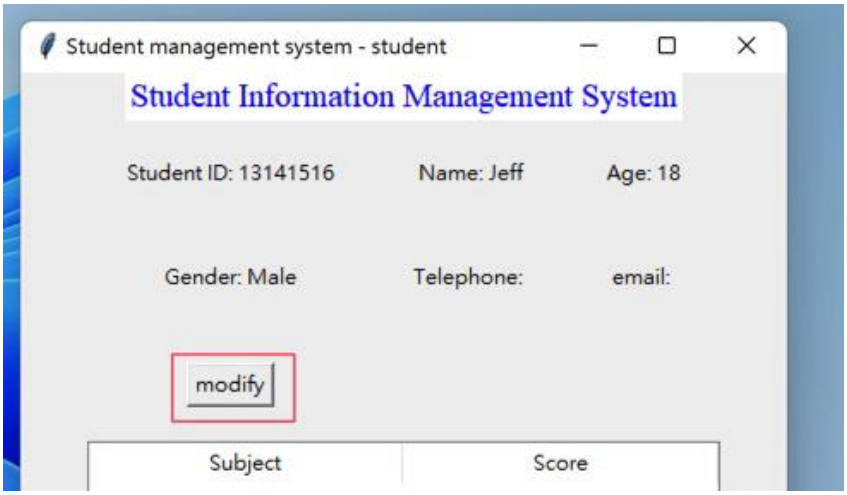
Teachers have the authority to view student's academic records. After pressing the show score button on the teacher's page, the subjects and scores studied by the students are shown. After student exam papers are marked, the teacher can upload the test scores of each subject to the student information management system.



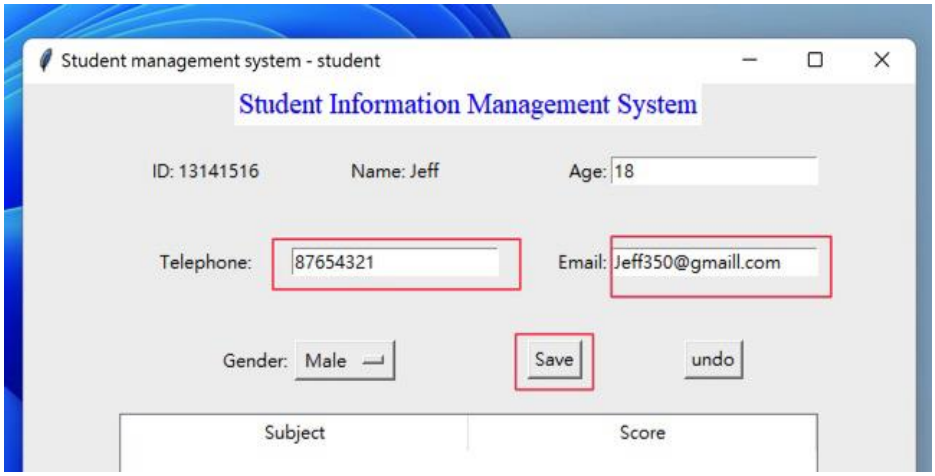
Teacher can add, delete and modify students' academic performance including subjects and scores. If students have questions about test paper scores, they can ask their teachers for discussion. Teachers also have the authority to change students' original scores to new scores as records.

5. Student's Function

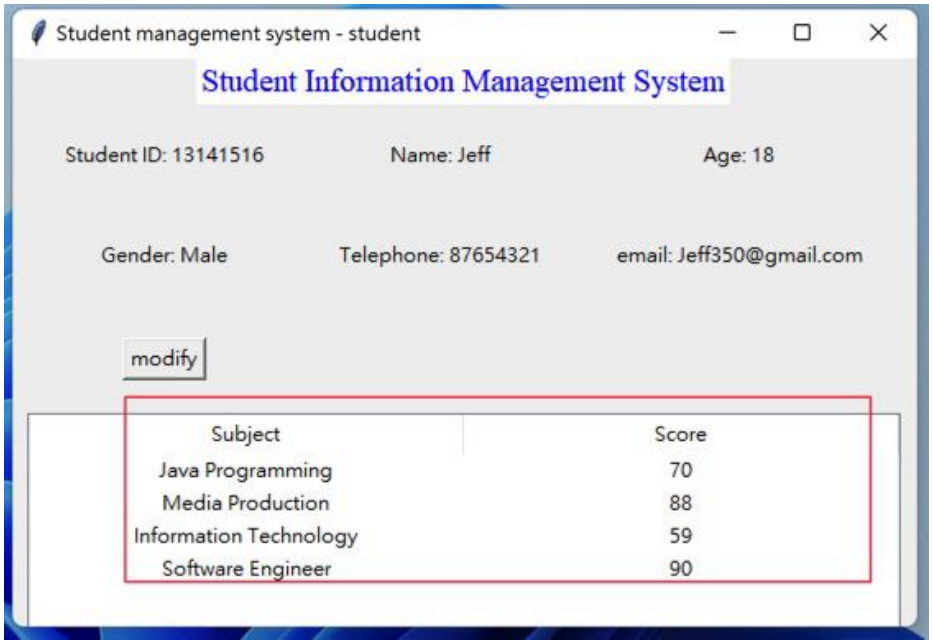
The role of student can upload personal information and modify personal profiles.



After students login to their accounts, they can view their personal information. Students can press modify button to enter the modify page to update their personal information.



Students can also add other information such as mobile phone number and email address into own profile. After entering needed data, click Save button and the new added data will be saved.



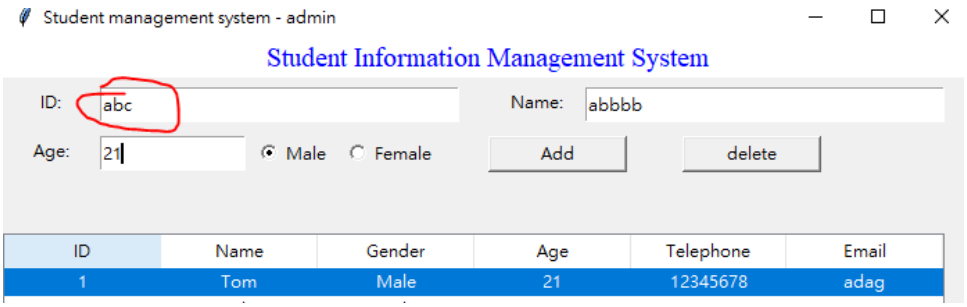
After the exam, the teacher marks exam paper and uploads all scores of every subject to student information management system. Students can login to the system to view their latest scores in different subjects.

After passing the validation test, our student information management system converts the theoretical design into working mode. According to the test results, different roles of users can also implement the functions of privacy settings, registration and running corresponding identities. Validation testing confirmed the success of the system. This can serve as a reference to make it operate efficiently and effectively.

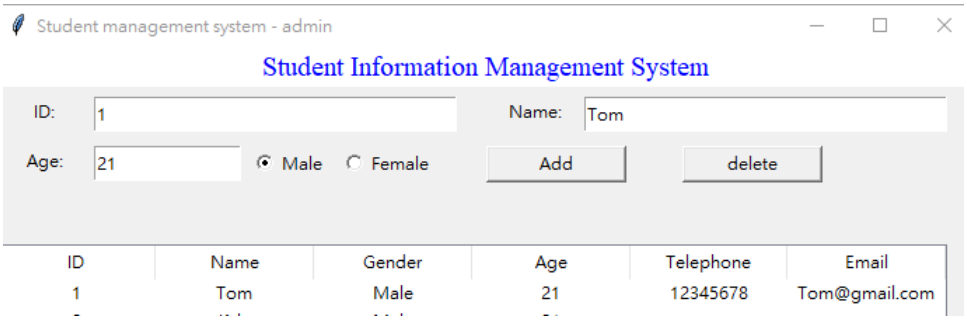
Defect Testing

We aim to test all possible variations of the proposed system and push the system to its limits. Therefore, we conducted various defect testing on the system program.
Then, this creates five problems below.

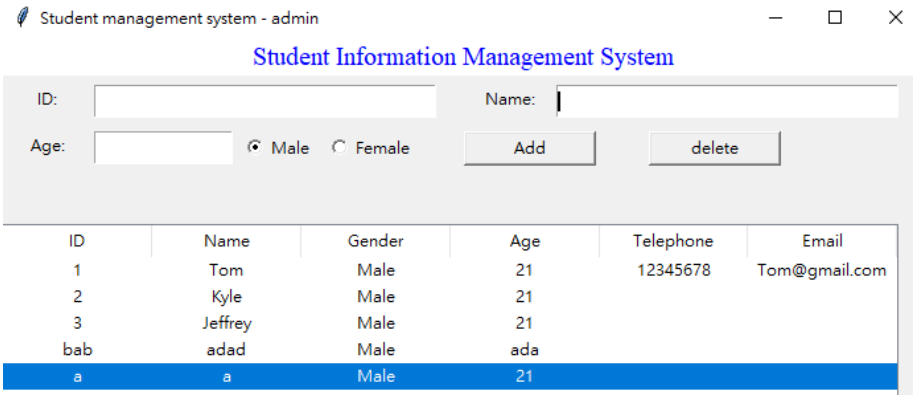
1. The admin page should not be typed using English words in ID textbox. If abc is typed, then the system will define it to a string and cause error.



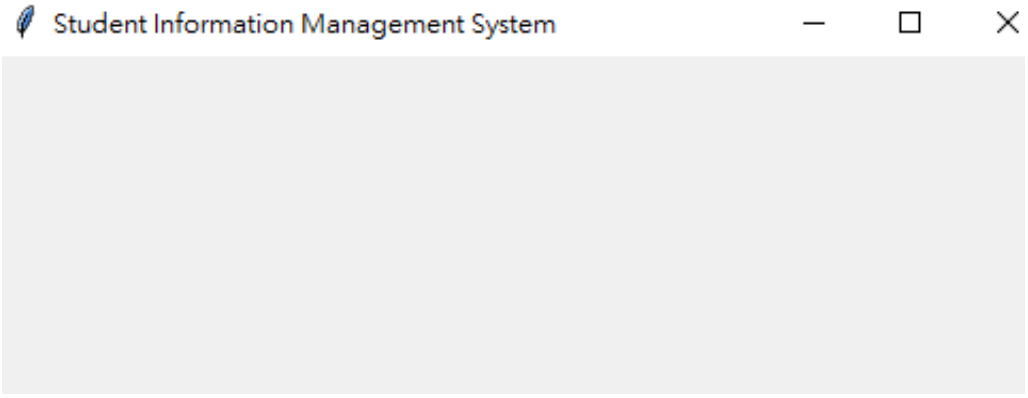
2. The system will crash if the admin tries to type the same value in ID, Name, Age textbox.



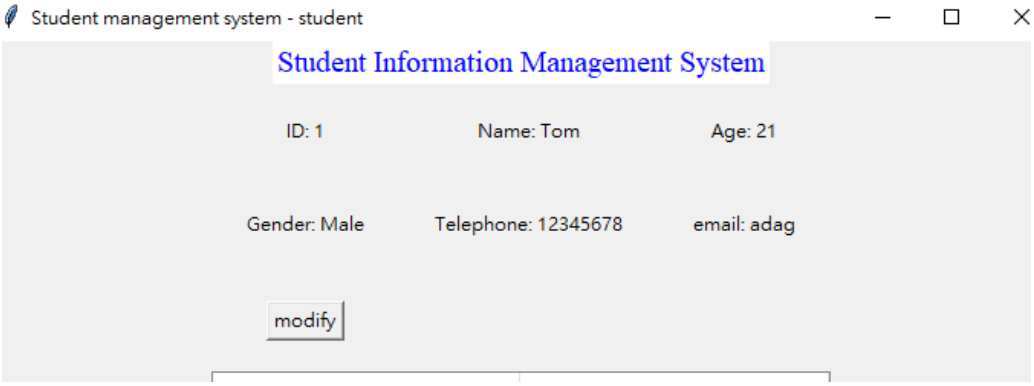
3. When the ID text box contains English words, the delete function cannot delete the string variable.



4. If a student enters an incorrect ID, the student page will display a blank page.



5. Students can modify values in emails without email type (@)



After defect testing, it can be expected that there are many possibilities for users to use the system. The system should make corresponding prompts or adjustments to users in response to different situations.

In order to avoid possible errors after the system is released, multiple sample tests are necessary. The testing process focuses on the logical intervals of the software to ensure that all statements are tested. Summarizing errors can help with system upgrades.

Conclusion

Our main focus for this project was to design a unique student management system that would implement the functionality of recording students' personal data. Student management system is software that is helpful to both students and school authorities. In the current system, all activities are done manually by us. This is very time consuming and expensive. The projects are the result of many humble attempts to meet the needs of our clients. The goal of our software planning is simply to provide a framework for making reasonable estimates within a limited timeframe, and to update regularly as the project progresses. Ultimately, we believe that the key to success is not just a great piece of work, but a well-rounded team. Our team members bring diverse skills and knowledge, and their collaboration and hard work are key to our success. We will continue to work hard with an almighty attitude to ensure the ultimate success of our project.