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| Lab 4 | | | Using Black Box Testing in System Testing | | | | | |
| Issue Date | | 2023-12-2 | | | experimental types | | □validation experiment,  □comprehensive experiment  ☑design experiment | |
| Goal   1. Using popular black-box testing techniques to verify whether your developed system is meet the requirements of users. | | | | | | | | |
| * experimental contents and process   **1. Division of labor**  Our division of labor is as follows.  **Robin Zhang** is responsible for the black box test of backend database structure, program functional modules, and logical relationships (Including login function module, news viewing function module, comment posting function module, and administrator management of users, comments, and news function module), and ultimately writing code to implement basic functional modules as well as test the final program.  **Yutao Sun** is responsible for the black box test of front-end interface design and code implementation, including integrating all functional modules into complete code. Simultaneously responsible for checking the database logic and drawing structural diagrams.  After completing the above work, we will have a meeting to discuss whether everyone's work content is perfect and whether the structure diagram of each module is correct. **Robin Zhang** will take the minutes.  **2.** **Report of Black-box Testing of** **Dormitory Management System**  2.1 Login module (Yutao Sun)  Table 1 Login module Test Case Table   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | Login module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Yutao Sun | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check whether the administrator login button functions properly | | Admin login | The botton turned gray and showed the log in interface. | | Successful | | No | | 1-2 | Check whether the user login button functions properly | | User login | The botton turned gray and showed the log in interface. | | Successful | | No |   Screenshot of test results:    Figure Use case 1-1          Figure Use case 1-2  2.2 View news module (Robin Zhang)  Table 2 News selection module Test Case Table   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | News selection | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Check if the selection works | Selection success, jump to the news | | Success | | NA | | 1-2 | Check if the login works | | Wrong account number and password | Hint secret error | | Success | | NA |   Screenshot of test results:  1 Jump to the news selection page    2 After jumping page:      2.3 Comment module  Table 3 Comment module Test case   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | Comment module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the comment works | | Check if the comment works | Comment success. | | Success | | “This is Comment.” | | 1-2 | Check if title of comments works | | Check if title of comments works | Title success. | | Success | | “This is title.” |     2.4 Admin Function selection module  Table 4 Admin Function selection module test case   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | Admin Function selection module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Click and Check if the selection works | Selectionsuccess. | | Success | | Click |     2.5 Admin Function module  Table 5 Admin Function module   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | Admin Function module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Click and Check if the selection works | Selectionsuccess. | | Success | | Click |   2.6 User management module  Table 6 User management module   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | User management module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Click and Check if the selection works | Selectionsuccess. | | Success | | Click |       2.7 News management module  Table 7 News management module   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | News management module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Click and Check if the selection works | Selectionsuccess. | | Success | | Click |       2.8 Comment management module  Table 8 Comment management module   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | Comment management module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Click and Check if the selection works | Selectionsuccess. | | Success | | Click | | 1-2 | Remove comment | | Click and remove the comment. | Removal success. | | Success. | | Click |         2.9 News management module  Table 9 News management module   |  |  |  |  |  |  |  |  |  | | --- | --- | --- | --- | --- | --- | --- | --- | --- | | **Module name** | | News management module | | | | | | | | **Version number** | | **Tester** | | | **Test type** | | **Test date** | | | 1.0 | | Robin Zhang | | | Functional testing | | 2024.12.2 | | | **Test phase** | | 〇Unit test 〇Integration test  ●Confirmation test 〇System test | | | | | | | | **Use case ID** | **Test purpose** | | **Input description** | **Expected result** | | **Actual result** | | **Test data** | | 1-1 | Check if the selection works | | Click and Check if the selection works | Selectionsuccess. | | Success | | Click | | 1-2 | Add news | | Click and add a news. | Addition success. | | Success. | | “New news.” |     **3. Meeting minutes**  **Conference Topic:** Software Engineering Experiments 5 -System Testing using Black-box Testing  **Participants:** Robin Zhang, Yutao Sun  **Minutes:**  **I. Purpose of the meeting**  The goal of this session is to verify whether the system we developed meets the needs of users using popular black-box testing techniques.  **Ii. Experimental guidance**  The following steps can be used as a reference to complete the current experiment:  First, we need to understand the basics of black-box testing, including equivalence partitioning and boundary value analysis.  Second, we need to select important or special modules or subsystems from our designed system. We need to review the original requirements of these modules or subsystems and describe in detail their preconditions (what kind of inputs the module requires) and postconditions (what kind of outputs the module provides). It should be noted that the number of selected modules or subsystems should not be less than the number of people in our group.  After that, we need to design black-box test cases for the selected module or subsystem, using a combination of equivalence partition and boundary value analysis methods.  Finally, we need to summarize our findings and write a system black-box test report. The report should include the following information: (a) the selected module or subsystem; (b) black-box test cases designed for those modules or subsystems; (c) Details of how these test cases validate the selected module or subsystem.  After completing the report, the head of each team should organize a meeting, in which all team members should attend, to review whether the report is complete, consistent, clear, etc.  **Iii. Contribution and problem feedback of group members**  **Robin Zhang:**  Robin Zhang is responsible for conducting black-box tests on the backend database structure, program functional modules, and logical relationships. This includes testing the login function module, news viewing module, comment posting module, and administrator management module (managing users, comments, and news). He is also tasked with coding and implementing the basic functional modules and performing final program tests. Robin noted that the primary challenge lies in ensuring the logical correctness of database interactions and seamless integration of all backend functionalities.  **Yutao Sun:**  Yutao Sun is responsible for black-box testing of the front-end interface design and its code implementation. His work includes integrating all functional modules into a cohesive program and verifying the database logic. Additionally, he is tasked with creating structural diagrams for the system. Yutao highlighted that the main challenge was ensuring smooth interaction between the front-end and back-end systems while maintaining consistency in the structural diagrams.  After completing their respective tasks, the team will hold a meeting to review the completeness of each member's work and the accuracy of the structural diagrams. During the meeting, Robin Zhang will take meeting minutes.  Fourth, the next step  1. Conduct more in-depth research and study on equivalent partition and boundary value analysis methods to improve our application ability in experiments.  2. Conduct a deeper analysis and study of the selected module or subsystem to determine its requirements and features more accurately.  3. Design more effective and comprehensive black box test cases to improve the accuracy and coverage of our tests.  4. Review and improve our reports to improve their quality and accuracy.  5. Prepare and attend team meetings to review our report and receive feedback and suggestions from other team members. | | | | | | | | |
| * Experimental summary/ Analysis   In this experiment, our team undertook the task of applying black-box testing techniques to ensure that our developed Dormitory Management System aligns with user requirements. Each team member was assigned specific modules for black-box testing, allowing for a clear division of labor and focused efforts on individual responsibilities.  Team collaboration was highly effective, with all members actively engaged in their respective tasks. The structured task allocation enabled everyone to concentrate on their assigned modules. Following the completion of individual tasks, a team meeting was held to review and discuss the results comprehensively. This collaborative approach ensured the integrity and consistency of the overall system and highlighted the team’s strong problem-solving skills and cooperation.  During test case design, we aimed to closely replicate real-world usage scenarios. For example, in the login module, we tested both successful and failed login cases to simulate actual user operations. This helped verify the system’s ability to handle various situations effectively and respond accurately.  Through this experiment, we not only fulfilled the assigned tasks but also gained valuable practical insights into system testing. From teamwork to problem-solving, this experience has significantly enhanced our understanding of software testing and provided a solid foundation for future software engineering endeavors. | | | | | | | | |
|  | Criteria | | | | | | | scale |
| Goal | | | | | | | A B C D E |
| Process | | | | | | |
| Design | | | | | | |
| Algorithm | | | | | | |
| Code | | | | | | |
| Data/Results | | | | | | |
| summary | | | | | | |
| written | | | | | | |
| Score | | |  | | tutor Signature：  Date: : | | |
| * Lab Evaluation Criteria   A: This lab is exceptional, working and meeting all of the specifications. The code is exceptionally well organized and very easy to follow. The code could be reused as a whole or each routine could be reused. The documentation is well written and clearly explains what the code is accomplishing and how. The program was delivered on time. The code is extremely efficient without sacrificing readability and understanding.  B: This lab is very good-- works and produces the correct results and displays them correctly. It also meets most of the other specifications. The code is fairly easy to read. Most of the code could be reused in other programs. The documentation consists of embedded comment and some simple header documentation that is somewhat useful in understanding the code. The program was delivered within a week of the due date. The code is fairly efficient without sacrificing readability and understanding.  C: This lab is adequate, with only minor deficiencies. The program produces correct results but does not display them correctly. The code is readable only by someone who knows what it is supposed to be doing. Some parts of the code could be reused in other programs. The documentation is simply comments embedded in the code with some simple header comments separating routines. The code was within 2 weeks of the due date. The code is brute force and unnecessarily long.  D: This lab shows some effort but has at least one major deficiency. The program is producing incorrect results. The code is poorly organized and very difficult to read. The code is not organized for reusability. The documentation is simply comments embedded in the code and does not help the reader understand the code. The code was more than 2 weeks overdue. The code is huge and appears to be patched together.  E: This lab is poorly written and shows very little effort or understanding. | | | | | | | | |