

Assignment 2: Criteria-Based Testing

Due¹: Sunday Week 10 (17/11/2024, 11:59pm Irish time)

Mark: 20%

1 Objective

The objective of this assignment is to familiarise you with criteria-based testing techniques and various coverage criteria. You will be provided with a Java program, and your task is to identify testing requirements based on coverage criteria, such as statement coverage and branch coverage, and then design and execute test cases to achieve different coverage levels.

2 Submission Guidelines

Submission will be soft copy only on **Brightspace**.

- One submission per group.
- TWO files: a report (pdf) and a Java file. NO Zip files.
- Submit by Sunday Week 10 (11:59pm Irish time).

3 Items to Submit

You need to submit your response in TWO ways:

1. **Report** documenting the assignment, including:
 - Summary.
 - Task 1 (Testing Requirements): a clear description of the identified testing requirements with justification provided.
 - Task 2 (Test Cases Using JUnit): a description of the test cases and the testing requirements they cover, as well as coverage level for each criterion.

The report should be well-structured, clear and organised, with proper headings and subheadings. **You should name your report: grp#_report. Format: PDF.**

2. **JUnit java file**: the JUnit class containing the test methods created for Task 2 of the assignment. **You should name your java file: Grp#_<YourTestClassName>.java.**

¹ Early submission of drafts is advised. The Brightspace assignment will be set up to accept unlimited submissions, however, each one will overwrite the previous one.

4 Guidelines and Rules for Effective Group Work

4.1 Collaboration and Communication

- *Active Participation:* Each group member must actively engage in discussions and contribute to the assignment.
- *Effective Communication:* Maintain open and respectful communication within the group. Ensure that everyone has an opportunity to express their ideas.
- *Meet Regularly:* Schedule regular group meetings or discussions to update progress, address questions, and make decisions collectively.

4.2 Task Assignment

- *Equal Distribution:* Assign tasks fairly among group members to ensure an equitable workload.
- *Matching Skills:* Consider each member's strengths and skills when assigning tasks. Assign tasks that align with individual expertise.
- *Deadline Awareness:* Be aware of task deadlines and work collectively to ensure all tasks are completed on time.

4.3 Conflict Resolution

- *Proactive Resolution:* If conflicts arise within the group, address them promptly and professionally. Seek solutions collaboratively.
- *Mediation:* If conflicts persist, consider involving the instructor or a mediator to facilitate resolution.
- *Non-Participation:* **If a group member consistently does not participate without a valid excuse, the group has the right to inform the instructor.** The instructor will reach out to the non-participating student to clarify the situation and encourage their participation.
- *Instructor Intervention:* If non-participation persists despite instructor intervention, **the instructor may ask the non-participating student to work on the assignment independently.**

4.4 Respect and Inclusion

- *Active Listening:* Listen attentively to others during group discussions, giving them the space to express their ideas without interruption.
- *Respect Diversity:* Embrace and respect diversity within the group. Create an inclusive environment where all voices are heard and valued.

5 Note on Plagiarism and Cheating

Plagiarism and cheating are **serious academic offenses** that undermine the integrity of the learning process and the reputation of both individuals and institutions. It is crucial that all group members understand and adhere to the principles of academic honesty throughout this assignment:

1. **Original Work:** All work submitted must be original and created by the group members themselves. Copying, reusing, or paraphrasing content from external sources without proper attribution is strictly prohibited.
2. **Proper Citation:** If you refer to external sources, including textbooks, online materials, or classmates' work, ensure that you provide appropriate citations. Failure to do so can be considered plagiarism.
3. **Collaboration vs. Copying:** Collaboration between groups is encouraged and expected, but there is a clear distinction between collaborative work and copying. Collaboration involves sharing ideas and discussing concepts to enhance understanding. Copying involves duplicating another person's work or ideas without adding your own input.
4. **Respect Group Contributions:** Every group member should actively contribute to the assignment's completion. Ensure that all members have a fair opportunity to participate in discussions and decision-making processes.

Consequences for plagiarism and cheating may include a failing grade for the assignment, academic probation, or more severe disciplinary actions as per university policies. Please take this note seriously and maintain the highest standards of academic integrity in your group's work. If you have any questions or uncertainties about what constitutes plagiarism or cheating, seek clarification from your module leader before submitting your assignment.

6 Assignment Specification: What You Need to Do

You will work on a bank account management system. Your goal is to identify testing requirements based on specific coverage criteria and implement test cases using JUnit.

6.1 Task 1: Testing Requirements (40%)

Your task is to identify testing requirements based on three coverage criteria: statement coverage, branch coverage and condition coverage for the bank account management system. You need to apply the three coverage criteria to each method in the system. Code and specifications for the system can be accessed below.

Code: [BankAccountManagementSystem.java](#)

Specifications: [Bank Management System Requirement Specification.pdf](#)

6.2 Task2: Test Cases Using Junit (40%)

Based on the identified requirements in the first task, you are required to do the following.

6.2.1 Task 2.1: Creating Test Cases (25%)

Create and implement test cases to satisfy the testing requirements in Task 1.

Note: Your report should clearly describe which test cases satisfy which testing requirements. Providing only code will not earn you any marks.

6.2.2 Task 2.2: Evaluating Coverage Levels (15%)

Evaluate and report on the achieved coverage levels for statement coverage, branch coverage and condition coverage in this system.

6.3 Report (Quality 20%)

You need to report on the two tasks above. Your report should:

- outline the testing requirements based on the coverage criteria for the improved bank account management system,
- indicate which test cases satisfy which requirements, and
- highlight the achieved coverage levels for each of the three criteria.

7 Assessment Criteria

The table provided outlines the assessment criteria and grading breakdown for evaluating your performance. Utilise these guidelines as a reference and consistently strive for excellence in your work.

Table 1 Assessment Criteria

Criteria	Excellent (80%-100%)	Proficient (60%-79%)	Satisfactory (40%-59%)	Limited (20%-39%)	Inadequate (0%-19%)
Task 1: Testing Requirements (40%)					
Task2: Test Cases Using JUnit (40%)					
Report Quality (20%)					

Group Mark: (<Group Score> / 100) (*20%)

7.1 Scoring Scale

Excellent:

- Represents an exceptional level of understanding and execution of the assignment's requirements.
- Achieves a performance that consistently exceeds the highest standards set by the assignment's objectives.
- Characterised by exceptional attention to detail, a comprehensive approach, and minimal to no errors.

Proficient:

- Shows strong competence in understanding and executing the assignment's requirements.
- Consistently meets or slightly exceeds the assignment's objectives.
- Characterised by strong attention to detail and a good depth of coverage.

Satisfactory:

- Meets the basic expectations for the assignment but may lack some depth or precision.
- Characterised by satisfactory quality, with moderate proficiency in fulfilling the assignment's requirements.
- May have occasional errors or incomplete coverage of the assignment's expectations.

Limited:

- Displays some understanding of the assignment's requirements and objectives.
- Achieves work that is somewhat effective but may have shown inconsistencies or gaps in execution.
- Characterised by a decent quality of work that may fall short in terms of depth, precision, or comprehensive coverage.

Inadequate:

- Fails to meet the minimum expectations for the assignment.
- Demonstrates significant deficiencies, resulting in incomplete, poorly executed work.
- Characterised by multiple errors, omissions, and inadequate coverage.