MODEL-BASED TESTING WITH DSM APPROACH
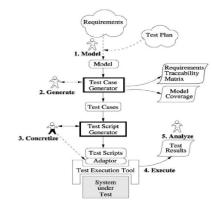
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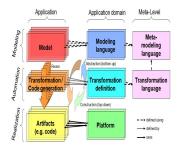
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Abstract

In software development, testing is an important process and indispensable to develop a reliability and high quality software system. Test case design is one of the important processes in the software testing. The system testing level is to verify if the whole system functions in correspondence to the system requirements. Our research focuses on studing a method for automatic test cases generation from use case specification with Model-based testing technique.

Main Objectives

1. Model - Based Testing (MBT)
2. Model – Driven SoftWare Engineering (MDSE)
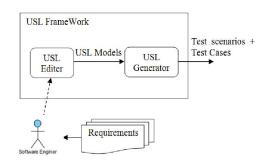3. Generate Test Cases from Use Case Specification

The model-based testing process [8]

Overview of the MDSE methodology [1]

Methods

-We proposed a formal method for Requirements specification

- We proposed testing generation algorithms and rated test coverage criterion

Results

-We proposed a method for automated test case generation from use case scenarios.

1. Pre-Condition Non
2. Pos-Condition
Allows access to acount
3. Trigger
User insert card at ATM
Basic flow
1   A: Insert Card
2   S: Validates card and Asks for PIN
3   A: Enters PIN
4   S: Validates PIN
5   S: Allows access to acount
Alternate flow
2a   Card not valid
S: Display message and reject card
4a   PIN nod valid
S: Display message and ask for retry(Twice), return 3
4b   PIN invalid 3 times
S: Eat card and exit

ID	Path	InPut	OutPut
1	B,1,2,3,4,5,E	CardNumber is Valid, PIN is Valid	stateCard= "Allows Access to Acount",
2	B,1,2,3,4,4a,3, 4,5,E	CardNumber is Valid,PIN is InValid, PIN is Valid	stateCard= "Allows Access to Acount",
3	B,1,2,3,4,4a,3, 4,4a,3,4,5,E	CardNumber is Valid, PIN is InValid, PIN is InValid, PIN is Valid,	stateCard= "Allows Access to Acount",
4	B,1,2,3,4,4a,3, 4,4a,3,4,4b,E	CardNumber is Valid, PIN is InValid, PIN is InValid, PIN is inValid,	(message= "PIN is valid 3 times") and (stateCard= Eat card")
5	B,1,2,2a,E,	CardNumber is Valid, CardNumber is invalid	(message= "Card is valid") and (stateCard= Reject")

Conclusion

- In this research, we concentrate on automating test case generation process in the model-based testing process.

- Our research aims to generate automatic test cases for system testing with the input is use cases Specifications.

References

1. Marco Brambilla, Jordi Cabot, and Manuel Wimmer. Model-Driven Software Engineering in Practice. Morgan & Claypool Publishers, 1st edition, 2012.

2. Alistair Cockburn. Writing Effective Use Cases. Addison-Wesley Longman Publishing Co., Inc., Boston, MA, USA, 1st edition, 2000.

3. F. G. Dias, E. A. Schmitz, M. L. M. Campos, A. L. Correa, and A. J. Alencar. Elaboration of use case specifications: An approach based on use case fragments. In Proceedings of the 2008 ACM Symposium on Applied Computing, SAC '08, pages 614618, New York, NY, USA, 2008. ACM.

4. IEEE. IEEE Recommended Practice for Software Requirements Specifications. ANSI/IEEE Standard 830-1998, 1998.

5. Ivar Jacobson and Magnus Christerson. A growing consensus on use cases. JOOP, 1995.

6. Cl²mentine Nebut, Franck Fleurey, Yves Le Traon, and Jean marc J²z²quel. Automatic test generation: A use case driven approach. IEEE Transactions on Software Engineering, 32:140155, 2006.

7. James Rumbaugh, Ivar Jacobson, and Grady Booch. Unified Modeling Language Reference Manual, The (2Nd Edition). Pearson Higher Education, 2004.

8. Mark Utting and Bruno Legeard. Practical Model-Based Testing: A Tools Approach. Morgan Kaufmann Publishers Inc., San Francisco, CA, USA, 2007.