Object-Z-Based Test Case Generator

A Manuscript

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by

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Object-Z-Based Test Case Generator

By Diep Mai

We recommend acceptance of this manuscript in partial fulfillment of this candidate's requirements for the degree of Master of Software Engineering in Computer Science. The candidate has completed the oral examination requirement of the capstone project for the degree.

Prof. Kasi Periyasamy
Examination Committee Chairperson

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Date

Abstract

Mai, Diep, H., “Object-Z-Based Test Case Generator,” Master of Software Engineering, May 2011, (Kasi Periyasamy, Ph.D.).

This manuscript describes the development of a specification-based test case generator following the model-based testing methodology. Model-based testing is performed based on the testing models derived from a system under test. This test case generator reads the Object-Z specification modeling a testing model from the command line and employs the boundary value analysis technique to generate test cases for the model. All test cases are categorized to valid and invalid set. In addition, the tool can also be used to verify the inconsistency and ambiguity in a specification.

Acknowledgements

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Table of Contents

List of Tables

List of Figures

Glossary

ANTLR

ANother Tool for Language Recognition. Successor to the Purdue Compiler Construction Tool Set (PCCTS). Currently maintained by Terence Parr.

BYACC/J

An extension of the Berkeley YACC-compatible parser generator. Can generate both C/C++ and Java parsers.

CUP

Constructor of Useful Parsers. A LALR parser generator written in Java.

IEEE

Institute of Electrical and Electronics Engineering. The world's largest professional association dedicated to advancing technological innovation and excellence for the benefit of humanity.

JFlex

A scanner generator for Java.

LALR

Look-Ahead Left to Right. LALR parsing algorithm, introduced by Frank DeRemer, provides the same high performance of LR parsing algorithm, introduced by Donald Knuth, but is more efficient in term of size.

LaTeX

LaTeX is a document markup language and document preparation systems for the TeX typesetting program.

SUT

System Under Test. This term refers to a system being tested for correct operation.

1. Introduction

1.1. Overview

This gives a brief overview of this section.

1.2. Point 1

This subsection gives a great deal of precise description supporting point 1. For example, Figure 1 explains in great detail a state chart.

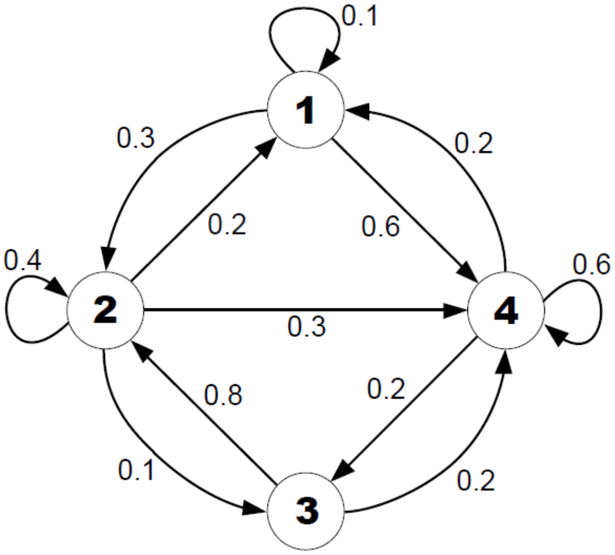

Figure 1. State Chart Diagram

1.3. Point 2

This gives Point 2

2. Requirements

2.1. Overview

This gives a brief overview of this section.

2.2. Point 1

This subsection gives a great deal of precise description supporting point 1. For example, Figure 2 explains in great detail a state chart.

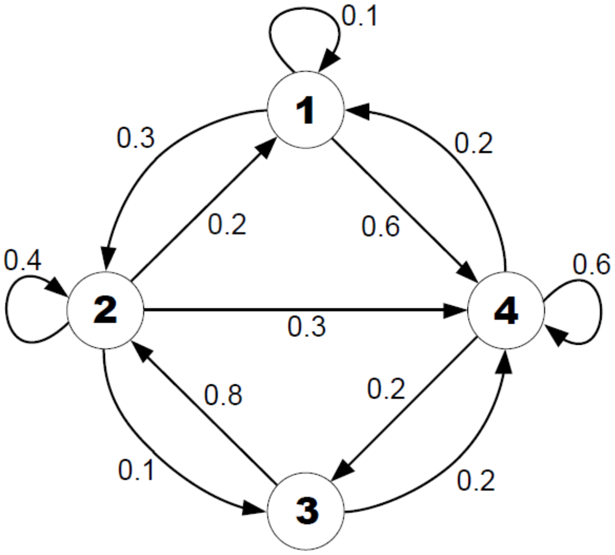

Figure 2. State Chart Diagram

2.3. Point 2

This gives Point 2

3. Design and Implementation

3.1. Overview

This gives a brief overview of this section.

3.2. Point 1

This subsection gives a great deal of precise description supporting point 1. For example, Figure 3 explains in great detail a state chart.

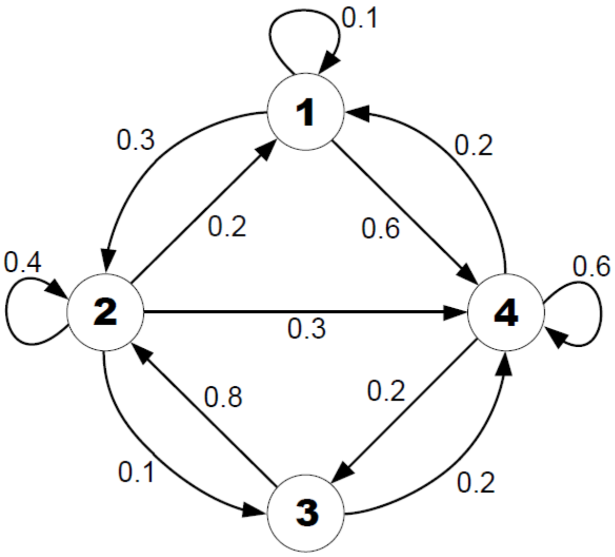

Figure 3. State Chart Diagram

3.3. Point 2

This gives Point 2

4. Bibliography

5. Appendices