

Webtoon Paint

Unit Test Plan, Specification and Report

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Unit Test Plan

○ Purpose

- Webtoon Paint는 기본적인 그림판 기능에 컷 별로 작업할 수 있는 기능, 컷들을 합칠 수 있는 기능을 추가한 그림판이다. 이 프로그램은 사용자의 입력에 따라 반응하는 프로그램으로 입력이 없을 경우에는 처리되는 내용이 없다. Unit Test는 각 사용자의 입력에 따른 반응하는 모듈들을 대상으로 하며 각 모듈들이 OSP 과정에서의 요구사항을 만족하는지 확인한다.

○ Test Technique

- 사용자의 입력에 따라 반응하는 모듈들을 대상으로 한다.
- JDK 1.4환경의 Eclipse Juno에서 JUnit을 사용하여 진행한다.

○ Test Execution Environment

- Window 7 64bit
- Eclipse Juno with JDK 1.4
- JUnit

○ Test Item

- 사용자의 입력을 받는 버튼들에 할당된 기능을 하나의 Unit으로 간주한다.
- 각 Unit의 기능과 OSP2041을 기반으로 test를 디자인한다.

○ Features not to be Tested

- GUI 관련 모듈 제외
 - showWindow1()
 - paint()
- Data 전달 모듈 제외
 - get, set Functions
- Output이 없는 모듈 제외
 - requestSaveCut(), requestMoveArea()

○ Features to be Tested

- 핵심적인 기능을 수행하는 모듈
 - requestLoadCut()
 - requestBrushing(), requestErasing()
 - requestSetLineSize(), requestSetColor()
 - requestSelectArea(), requestDelArea()
 - requestCutOffArea(), requestCopyArea()
 - requestPasteArea()
 - requestAddCut(), requestChangeCut()
 - requestDelCut(), requestSetCutSize()
 - requestMergeCut()

Unit Test Specification

Test Design Specification

○ requestLoadImage()

Identifier	Feature	Value
WTT.UTD.01	pj.cuts	컷 목록, 불러오기 기능 사용 시에 컷이 하나 증가

○ requestBrushing()

Identifier	Feature	Value
WTT.UTD.02	SelectedTool	현재 사용되고 있는 도구, 1로 변경된다 0. None 1. Brush 2. Eraser 3. Area
	dt.linesize	DrawingTool에 저장된 굵기 1. 가늘게 5. 굵게

○ requestSetLineSize()

Identifier	Feature	Value
WTT.UTD.03	Input/ size	변경할 굵기
	this.size	Interface에서 사용하고 있는 굵기, 변경할 굵기로 변경
	dt.linesize	DrawingTool에 저장된 굵기, 변경할 굵기로 변경 1. 가늘게 5. 굵게

Test Design Specification

○ requestSelectArea()

Identifier	Feature	Value
WTT.UTD.04	SelectedTool	현재 사용되고 있는 도구, 3으로 변경된다 0. None 1. Brush 2. Eraser 3. Area

○ requestCutOffArea()

Identifier	Feature	Value
WTT.UTD.05	at.areastat	영역의 활성화 상태, 잘라내기 후 비활성화된다
	SelectedTool	현재 사용되고 있는 도구, 0으로 변경된다 0. None 1. Brush 2. Eraser 3. Area

Test Design Specification

○ requestPasteArea()

Identifier	Feature	Value
WTT.UTD.06	At.areastat	영역의 활성화 상태, 붙여넣기 후 활성화된다
	pj.cuts	컷 목록
	SelectedTool	현재 사용되고 있는 도구, 3으로 변경된다 0. None 1. Brush 2. Eraser 3. Area

○ requestAddCut()

Identifier	Feature	Value
WTT.UTD.07	pj.cuts	컷 목록, 컷이 하나 증가
	cuts.cutstat	해당 컷이 활성화 되었는지 여부, 마지막 컷만 활성화
	EnabledCutNum	활성화된 컷의 번호, 컷 목록의 길이로 변경

Test Design Specification

○ requestDelCut()

Identifier	Feature	Value
WTT.UTD.o8	pj.cuts	컷 목록, 컷이 하나 감소
	cuts.cutstat	해당 컷이 활성화 되었는지 여부, 활성화되어 있던 컷의 다음 컷만 활성화
	EnabledCutNum	활성화된 컷의 번호

○ requestMergeCut()

Identifier	Feature	Value
WTT.UTD.o9	pj.cuts	컷 목록, 컷이 하나 증가
	cuts.cutstat	해당 컷이 활성화 되었는지 여부, 마지막 컷만 활성화
	cuts.height	해당 컷이 갖고 있는 이미지의 높이
	EnabledCutNum	활성화된 컷의 번호, 컷 목록의 길이로 변경

Test Design Specification

○ requestErasing()

Identifier	Feature	Value
WTT.UTD.10	SelectedTool	현재 사용되고 있는 도구, 2로 변경된다 0. None 1. Brush 2. Eraser 3. Area
	dt.linesize	DrawingTool에 저장된 굵기 1. 가늘게 5. 굵게

○ requestSetColor()

Identifier	Feature	Value
WTT.UTD.11	this.color	Interface에서 사용하고 있는 색, 변경할 색으로 변경
	dt.brush.color	DrawingTool의 brush에 저장된 색, 변경할 색으로 변경

Test Design Specification

○ requestDelArea()

Identifier	Feature	Value
WTT.UTD.12	SelectedTool	현재 사용되고 있는 도구, 1으로 변경된다 0. None 1. Brush 2. Eraser 3. Area

○ requestCopyArea()

Identifier	Feature	Value
WTT.UTD.13	SelectedTool	현재 사용되고 있는 도구, 3으로 변경된다 0. None 1. Brush 2. Eraser 3. Area

Test Design Specification

- requestChangeCut()

Identifier	Feature	Value
WTT.UTD.14	cuts.cutstat	해당 컷이 활성화 되었는지 여부, 전환 후 컷만 활성화
	EnabledCutNum	활성화된 컷의 번호

- requestSetCutSize()

Identifier	Feature	Value
WTT.UTD.15	cuts.height	해당 컷이 갖고 있는 이미지의 높이
	cuts.width	해당 컷이 갖고 있는 이미지의 너비

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.01.01	<code>pj.cuts.size() = 0</code>	<code>pj.cuts.size() = 1</code>
WTT.UTC.01.02	<code>pj.cuts.size() = 1</code>	<code>pj.cuts.size() = 2</code>
WTT.UTC.01.03	<code>pj.cuts.size() = 2</code>	<code>pj.cuts.size() = 3</code>
WTT.UTC.01.04	<code>pj.cuts.size() = 3</code>	<code>pj.cuts.size() = 4</code>
WTT.UTC.01.05	<code>pj.cuts.size() = 999</code>	<code>pj.cuts.size() = 1000</code>

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.02.01	dt.linesize = 1, SelectedTool = 0	dt.linesize = 1, SelectedTool = 1
WTT.UTC.02.02	dt.linesize = 1, SelectedTool = 1	dt.linesize = 1, SelectedTool = 1
WTT.UTC.02.03	dt.linesize = 1, SelectedTool = 2	dt.linesize = 1, SelectedTool = 1
WTT.UTC.02.04	dt.linesize = 1, SelectedTool = 3	dt.linesize = 1, SelectedTool = 1
WTT.UTC.02.06	dt.linesize = 5, SelectedTool = 0	dt.linesize = 5, SelectedTool = 1
WTT.UTC.02.07	dt.linesize = 5, SelectedTool = 1	dt.linesize = 5, SelectedTool = 1
WTT.UTC.02.08	dt.linesize = 5, SelectedTool = 2	dt.linesize = 5, SelectedTool = 1
WTT.UTC.02.09	dt.linesize = 5, SelectedTool = 3	dt.linesize = 5, SelectedTool = 1

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.03.01	size = 1, this.size = 5, dt.linesize = 5	this.size = 1, dt.linesize = 1
WTT.UTC.03.02	size = 1, this.size = 1, dt.linesize = 5	this.size = 1, dt.linesize = 1
WTT.UTC.03.03	size = 1, this.size = 1, dt.linesize = 1	this.size = 1, dt.linesize = 1
WTT.UTC.03.04	size = 1, this.size = 5, dt.linesize = 1	this.size = 1, dt.linesize = 1
WTT.UTC.03.05	size = 5, this.size = 5, dt.linesize = 5	this.size = 5, dt.linesize = 5
WTT.UTC.03.06	size = 5, this.size = 1, dt.linesize = 5	this.size = 5, dt.linesize = 5
WTT.UTC.03.07	size = 5, this.size = 1, dt.linesize = 1	this.size = 5, dt.linesize = 5
WTT.UTC.03.08	size = 5, this.size = 5, dt.linesize = 1	this.size = 5, dt.linesize = 5

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.04.01	SelectedTool = 0	SelectedTool = 3
WTT.UTC.04.02	SelectedTool = 1	SelectedTool = 3
WTT.UTC.04.03	SelectedTool = 2	SelectedTool = 3
WTT.UTC.04.04	SelectedTool = 3	SelectedTool = 3

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.05.01	at.areastat = true, SelectedTool = 0	at.areastat = false, SelectedTool = 0
WTT.UTC.05.02	at.areastat = true, SelectedTool = 1	at.areastat = false, SelectedTool = 0
WTT.UTC.05.03	at.areastat = true, SelectedTool = 2	at.areastat = false, SelectedTool = 0
WTT.UTC.05.04	at.areastat = true, SelectedTool = 3	at.areastat = false, SelectedTool = 0
WTT.UTC.05.05	at.areastat = false, SelectedTool = 0	at.areastat = false, SelectedTool = 0
WTT.UTC.05.06	at.areastat = false, SelectedTool = 1	at.areastat = false, SelectedTool = 0
WTT.UTC.05.07	at.areastat = false, SelectedTool = 2	at.areastat = false, SelectedTool = 0
WTT.UTC.05.08	at.areastat = false, SelectedTool = 3	at.areastat = false, SelectedTool = 0

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.06.01	at.areastat = true, SelectedTool = 0	at.areastat = true, SelectedTool = 3
WTT.UTC.06.02	at.areastat = true, SelectedTool = 1	at.areastat = true, SelectedTool = 3
WTT.UTC.06.03	at.areastat = true, SelectedTool = 2	at.areastat = true, SelectedTool = 3
WTT.UTC.06.04	at.areastat = true, SelectedTool = 3	at.areastat = true, SelectedTool = 3
WTT.UTC.06.05	at.areastat = false, SelectedTool = 0	at.areastat = true, SelectedTool = 3
WTT.UTC.06.06	at.areastat = false, SelectedTool = 1	at.areastat = true, SelectedTool = 3
WTT.UTC.06.07	at.areastat = false, SelectedTool = 2	at.areastat = true, SelectedTool = 3
WTT.UTC.06.08	at.areastat = false, SelectedTool = 3	at.areastat = true, SelectedTool = 3

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.07.01	<code>pj.cuts.size() = 0,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = err</code>	<code>pj.cuts.size() = 1,</code> <code>pj.cuts.get(1).cutstat = true</code>
WTT.UTC.07.02	<code>pj.cuts.size() = 1,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 2,</code> <code>pj.cuts.get(2).cutstat = true</code>
WTT.UTC.07.03	<code>pj.cuts.size() = 2,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 3,</code> <code>pj.cuts.get(3).cutstat = true</code>
WTT.UTC.07.04	<code>pj.cuts.size() = 3,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 4,</code> <code>pj.cuts.get(4).cutstat = true</code>
WTT.UTC.07.05	<code>pj.cuts.size() = 999,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 1000,</code> <code>pj.cuts.get(1000).cutstat = true</code>

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.o8.01	<code>pj.cuts.size() = 0,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = err</code>	<code>pj.cuts.size() = 0,</code> <code>pj.cuts.get(0).cutstat = err</code>
WTT.UTC.o8.02	<code>pj.cuts.size() = 1,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 0,</code> <code>pj.cuts.get(0).cutstat = err</code>
WTT.UTC.o8.03	<code>pj.cuts.size() = 2,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 3,</code> <code>pj.cuts.get(3).cutstat = true</code>
WTT.UTC.o8.04	<code>pj.cuts.size() = 3,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 4,</code> <code>pj.cuts.get(4).cutstat = true</code>
WTT.UTC.o8.05	<code>pj.cuts.size() = 999,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code>	<code>pj.cuts.size() = 998,</code> <code>pj.cuts.get(998).cutstat = true</code>

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.09.01	<code>pj.cuts.size() = 0,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = err</code> <code>pj.cuts.get(EnabledCutNum).height = err</code>	<code>pj.cuts.size() = 0,</code> <code>pj.cuts.get(0).cutstat = err</code> <code>pj.cuts.get(EnabledCutNum).height = err</code>
WTT.UTC.09.02	<code>pj.cuts.size() = 1,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height = 500</code>	<code>pj.cuts.size() = 2,</code> <code>pj.cuts.get(2).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height > 500</code>
WTT.UTC.09.03	<code>pj.cuts.size() = 2,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height = 500</code>	<code>pj.cuts.size() = 3,</code> <code>pj.cuts.get(3).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height > 500</code>
WTT.UTC.09.04	<code>pj.cuts.size() = 3,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height = 500</code>	<code>pj.cuts.size() = 4,</code> <code>pj.cuts.get(4).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height > 500</code>
WTT.UTC.09.05	<code>pj.cuts.size() = 999,</code> <code>pj.cuts.get(EnabledCutNum).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height = 500</code>	<code>pj.cuts.size() = 1000,</code> <code>pj.cuts.get(1000).cutstat = true</code> <code>pj.cuts.get(EnabledCutNum).height > 500</code>

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.10.01	dt.linesize = 1, SelectedTool = 0	dt.linesize = 1, SelectedTool = 2
WTT.UTC.10.02	dt.linesize = 1, SelectedTool = 1	dt.linesize = 1, SelectedTool = 2
WTT.UTC.10.03	dt.linesize = 1, SelectedTool = 2	dt.linesize = 1, SelectedTool = 2
WTT.UTC.10.04	dt.linesize = 1, SelectedTool = 3	dt.linesize = 1, SelectedTool = 2
WTT.UTC.10.05	dt.linesize = 5, SelectedTool = 0	dt.linesize = 5, SelectedTool = 2
WTT.UTC.10.06	dt.linesize = 5, SelectedTool = 1	dt.linesize = 5, SelectedTool = 2
WTT.UTC.10.07	dt.linesize = 5, SelectedTool = 2	dt.linesize = 5, SelectedTool = 2
WTT.UTC.10.08	dt.linesize = 5, SelectedTool = 3	dt.linesize = 5, SelectedTool = 2

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.11.01	this.color = 1, dt.brush.color = 1	dt.brush.color = 5
WTT.UTC.11.02	this.color = 1, dt.brush.color = 2	dt.brush.color = 5
WTT.UTC.11.03	this.color = 1, dt.brush.color = 3	dt.brush.color = 5
WTT.UTC.11.04	this.color = 1, dt.brush.color = 4	dt.brush.color = 5
WTT.UTC.11.05	this.color = 1, dt.brush.color = 5	dt.brush.color = 5
WTT.UTC.11.06	this.color = 1, dt.brush.color = 6	dt.brush.color = 5
WTT.UTC.11.07	this.color = 1, dt.brush.color = 7	dt.brush.color = 5
WTT.UTC.11.08	this.color = 1, dt.brush.color = 8	dt.brush.color = 5
WTT.UTC.11.09	this.color = 1, dt.brush.color = 9	dt.brush.color = 5
WTT.UTC.11.10	this.color = 1, dt.brush.color = 10	dt.brush.color = 5
	이하 반복문 이용한 대입	

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.12.01	if.selectedtool = 0, at.areastat = false;	if.selectedtool = 0, at.areastat = false;
WTT.UTC.12.02	if.selectedtool = 1, at.areastat = false;	if.selectedtool = 1, at.areastat = false;
WTT.UTC.12.03	if.selectedtool = 2, at.areastat = false;	if.selectedtool = 2, at.areastat = false;
WTT.UTC.12.04	if.selectedtool = 3, at.areastat = false;	if.selectedtool = 3, at.areastat = false;
WTT.UTC.12.05	if.selectedtool = 0, at.areastat = true;	if.selectedtool = 0, at.areastat = false;
WTT.UTC.12.06	if.selectedtool = 1, at.areastat = true;	if.selectedtool = 0, at.areastat = false;
WTT.UTC.12.07	if.selectedtool = 2, at.areastat = true;	if.selectedtool = 0, at.areastat = false;
WTT.UTC.12.08	if.selectedtool = 3, at.areastat = true;	if.selectedtool = 0, at.areastat = false;

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.13.01	if.selectedtool = 0, at.areastat = true;	if.selectedtool = 3, at.areastat = true;
WTT.UTC.13.02	if.selectedtool = 1, at.areastat = true;	if.selectedtool = 3, at.areastat = true;
WTT.UTC.13.03	if.selectedtool = 2, at.areastat = true;	if.selectedtool = 3, at.areastat = true;
WTT.UTC.13.04	if.selectedtool = 3, at.areastat = true;	if.selectedtool = 3, at.areastat = true;

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.14.01	EnabledCutNum = 4 pj.cuts.get(EnabledCutNum).cutstat = true	EnabledCutNum = 0 pj.cuts.get(EnabledCutNum).cutstat = true
WTT.UTC.14.02	EnabledCutNum = 0 pj.cuts.get(EnabledCutNum).cutstat = true	EnabledCutNum = 1 pj.cuts.get(EnabledCutNum).cutstat = true
WTT.UTC.14.03	EnabledCutNum = 1 pj.cuts.get(EnabledCutNum).cutstat = true	EnabledCutNum = 2 pj.cuts.get(EnabledCutNum).cutstat = true
WTT.UTC.14.04	EnabledCutNum = 2 pj.cuts.get(EnabledCutNum).cutstat = true	EnabledCutNum = 3 pj.cuts.get(EnabledCutNum).cutstat = true
WTT.UTC.14.05	EnabledCutNum = 3 pj.cuts.get(EnabledCutNum).cutstat = true	EnabledCutNum = 4 pj.cuts.get(EnabledCutNum).cutstat = true

Test Case Specification

Identifier	Input Specification	Output Specification
WTT.UTC.15.01	<code>pj.cuts.get(EnabledCutNum).width = 300</code> <code>pj.cuts.get(EnabledCutNum).height = 300</code>	<code>pj.cuts.get(EnabledCutNum).width = 100</code> <code>pj.cuts.get(EnabledCutNum).height = 100</code>
WTT.UTC.15.02	<code>pj.cuts.get(EnabledCutNum).width = 100</code> <code>pj.cuts.get(EnabledCutNum).height = 100</code>	<code>pj.cuts.get(EnabledCutNum).width = 1</code> <code>pj.cuts.get(EnabledCutNum).height = 1</code>

Unit Test Report

Unit Test Report

The screenshot displays the Package Explorer window in an IDE, showing the results of a JUnit test run. The window title is "Package Explorer" and the active tab is "JUnit". The status bar indicates "Finished after 5.025 seconds". Below this, the test results are summarized: "Runs: 15/15", "Errors: 0", and "Failures: 0". A green progress bar is visible below the summary. The test results are listed under the "InterfaceTest [Runner: JUnit 4] (4.893 s)" entry. Each test method is preceded by a green checkmark icon, indicating a successful pass. The test methods and their durations are:

- testRequestLoadImage (4.472 s)
- testRequestBrushing (0.011 s)
- testRequestErasing (0.012 s)
- testRequestSetLineSize (0.010 s)
- testRequestSetColor (0.020 s)
- testRequestSelectArea (0.010 s)
- testRequestCutOffArea (0.068 s)
- testRequestPasteArea (0.012 s)
- testRequestDelArea (0.009 s)
- testRequestCopyArea (0.040 s)
- testRequestAddCut (0.020 s)
- testRequestDelCut (0.019 s)
- testRequestSetCutSize (0.011 s)
- testRequestChangeCut (0.010 s)
- testRequestMergeCut (0.168 s)

At the bottom of the window, there is a "Failure Trace" section with a hamburger menu icon and a "Failure Trace" label. To the right of the label are two icons: a magnifying glass and a document icon.