

Reverse Engineering, 안드로이드 학습

@geekbeast

진성주

00 Trend

요즘 대세는?

1. 클라우드

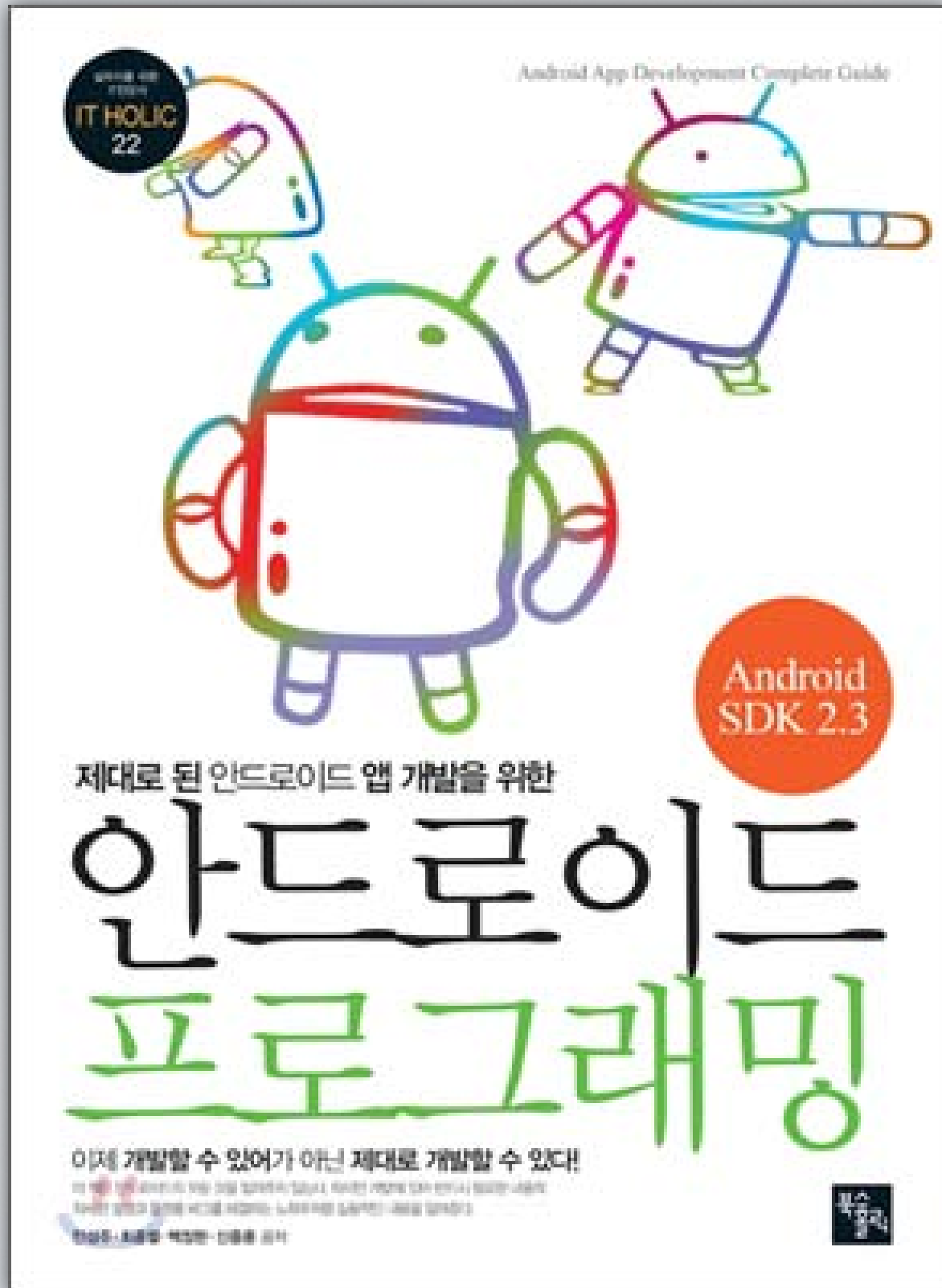
2. 모바일

1. 아이폰

2. 안드로이드

3. 아이유

00 Introduce



진성주

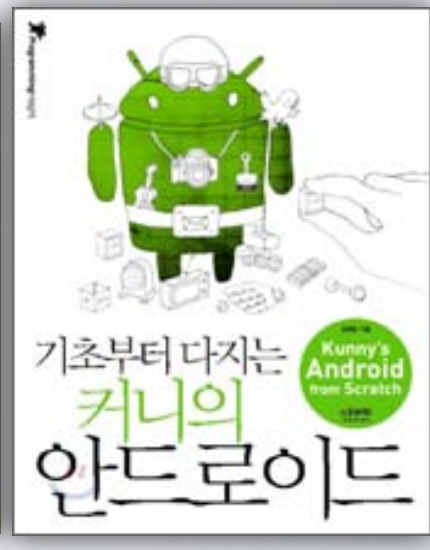
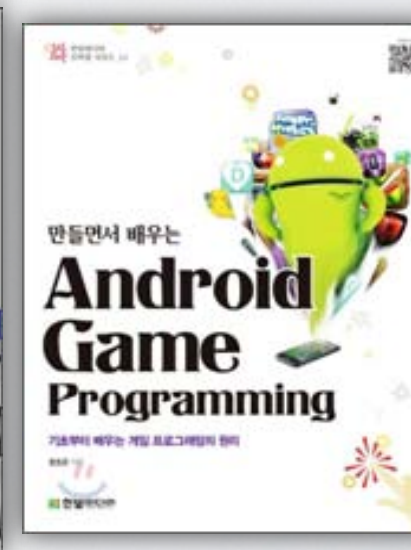
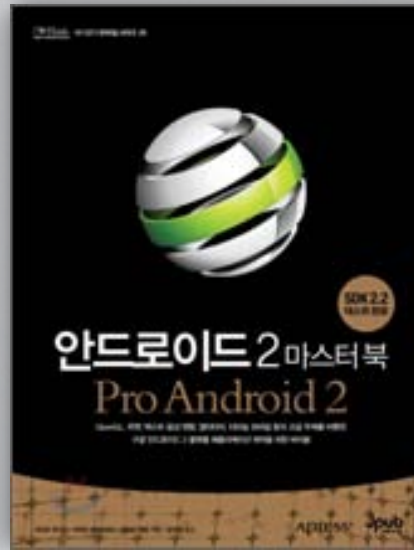
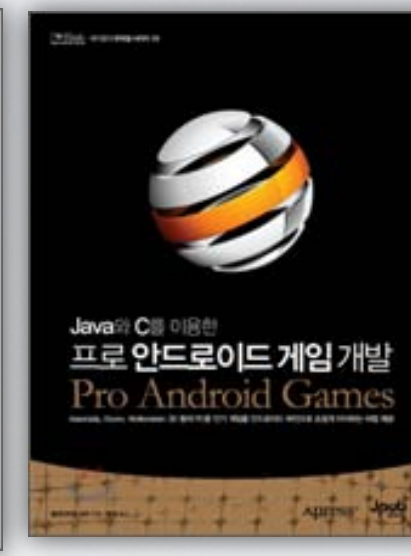
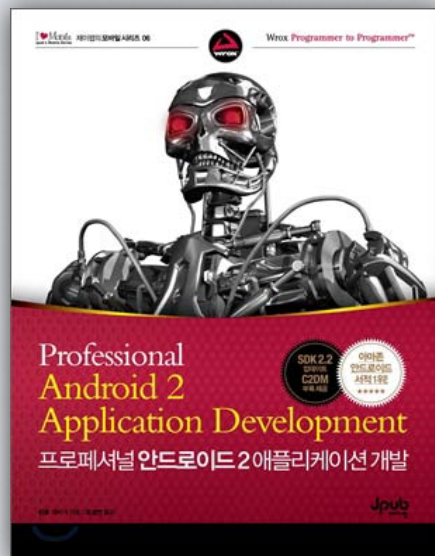
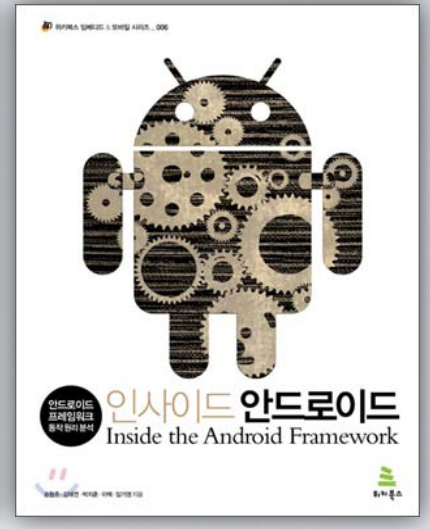
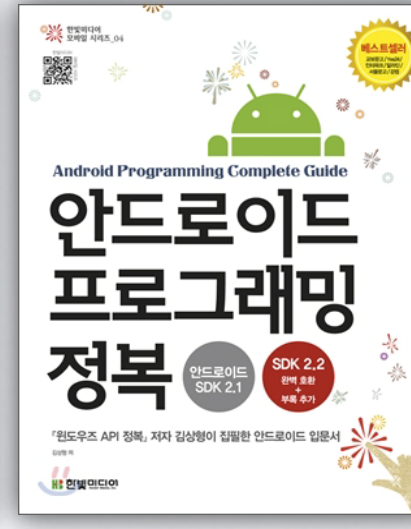
- OKJSP Android Project

안드로이드 프로그래밍

: 제대로 된 안드로이드 앱 개발을 위한

진성주,최종열,백정현,신중훈(공저)

01 Motivation



01 Motivation



01 Motivation

과연? 이렇게 공부하면,
야근을 줄일 수 있을까?

근로자는 야근
없는 권리

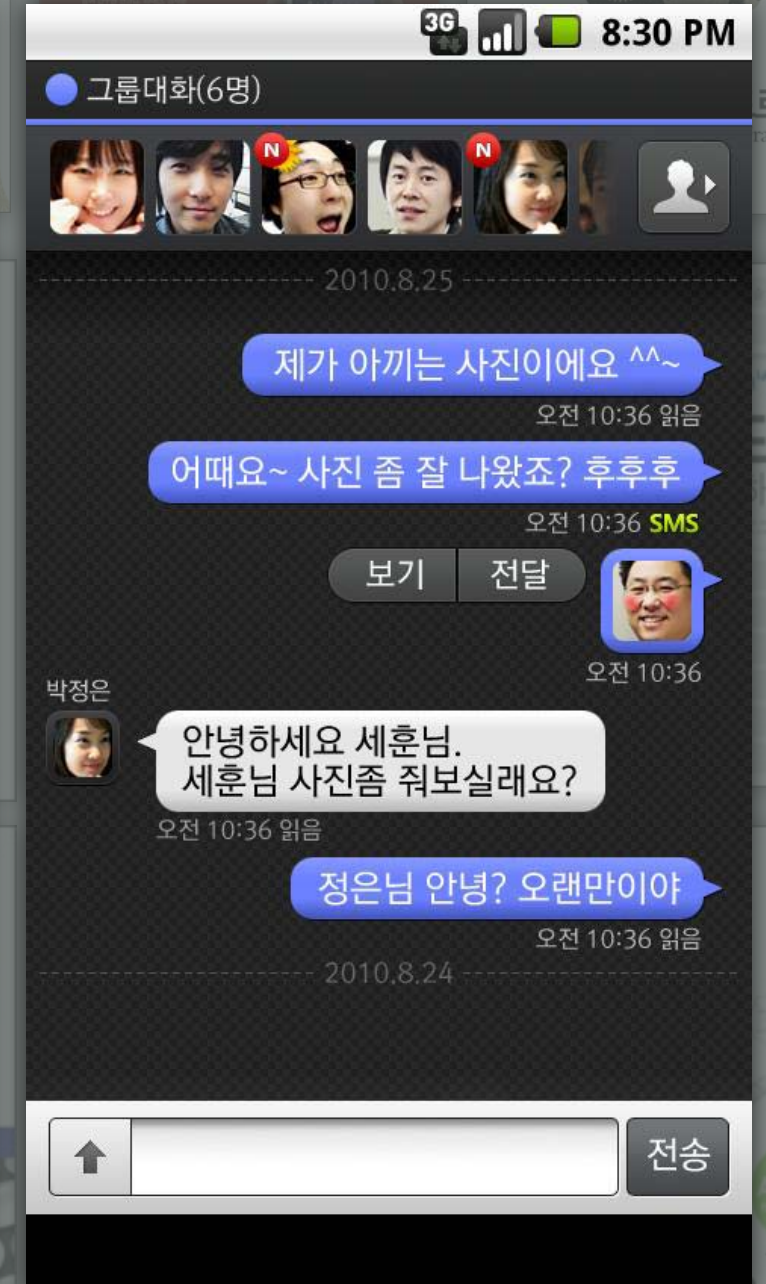
01 Motivation

Android를 처음 접하는 분에게, **빛과 같은 존재**



01 Motivation

하지만, 우리에게 주어진 미션은!!!



01 Motivation



안드로이드를 빨리 이해하기 위한 방법

1. OpenSource 활용
2. Reverse Engineering 활용하여 학습하기
 1. 리버스엔지니어링이 뭔가요?
 2. 어떻게 Android Application 리버스싱하나요?
3. Reverse Engineering 활용한 학습예제

02 Open Source 활용, 구글 코드

Project Hosting on Google code

Explore project labels:

[Python](#)

[Java](#)

[CPlusPlus](#)

[PHP](#)

[MySQL](#)

[Flash](#)

[DotNet](#)

[jQuery](#)

[Game](#)

[Database](#)

[Windows](#)

[Linux](#)

[AppEngine](#)

[GWT](#)

<http://code.google.com/hosting/>



[Sign in to create a project](#)



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02 Open Source 활용, 구글 코드

Google code

Results 21 - 30 of 544

[live-android - A LiveCD for Android](#)

Activity:  Medium - Updated: Last 7 days

- Thanks for your guys loving this project, for some reason, this project will freeze. You can go to get another awesome one, they make better. You can also mail to: liveandroid@gmail.com, we h...

[android](#), [livecd](#), [x86](#)

[android-vnc-viewer - VNC viewer/client for Android platform](#)

Activity:  High - Updated: Yesterday

A VNC viewer for Android platform. android-vnc-viewer is forked from tightVNC viewer. This project is still under development. Your feedback is highly appreciated. android-vnc-viewer is now avai...

[android](#), [vnc](#), [rfb](#)

[android-wifi-tether - Wireless Tether for Root Users](#)

Activity:  High - Updated: Today

This program enables tethering (via wifi and bluetooth) for "rooted" handsets running android (such as the Android DevPhone 1). Clients (your laptop for example) can connect via wifi (ad-hoc mode) or ...

[Android](#), [Root](#), [Wifi](#), [Tethering](#), [Bluetooth](#)

[fbconnect-android - Facebook Connect for Android](#)

Activity:  Medium - Updated: Last 30 days

This project is a port of Facebook Connect for iPhone to Android platform. See also Tutorial by Mobisoft || || ...

[android](#), [facebook](#), [connect](#), [fbconnect](#)

02 Open Source 활용, 코드 검색



Search public source code

Search Code

Search via regular expression, e.g. `^java/.*\.java$`

New

[Search Chromium Sources](#)

Search Options

In Search Box

<http://google.com/codesearch>

Class

class:HashMap

Function

function:toString

License

license:mozilla

Case Sensitive ☐ yes ☒ no

case:no

Best viewed with Firefox 3.5 and up, Safari, IE8 or Chrome.

[Google Home](#) - [Google Code](#) - [Discuss](#) - [Terms of Service](#) - [Help](#) - [Submit Your Code](#)

©2011 Google - [Privacy](#)

02 Open Source 활용, 코드 검색



코드

전체 3,324개 결과 중 1 - 10(0.24 초)

[java/com/google/scrollview/ScrollView.java](#) - 9개의 동일한 결과

```
27: /**
28:  * The ScrollView class is the main class which gets started from the command
29:  * line. It sets up LUA and handles the network processing.
```

```
31: */
32: public class ScrollView {
33:
```

```
76:     if (error) {
77:         System.out.println("Connection error. Quitting ScrollView Server...");
78:         System.exit(0);
```

[android.git.kernel.org/platform/external/tesseract.git](#) - [Apache](#) - Java - [tesseract.git](#)에 더 많은 결과가 있습니다. »

[core/java/android/widget/ScrollView.java](#) - 1개의 동일한 결과

```
54:  * <p>ScrollView only supports vertical scrolling.
55:  */
56: public class ScrollView extends FrameLayout {
```

```
136:     public ScrollView(Context context) {
137:         this(context, null);
```

```
140:     public ScrollView(Context context, AttributeSet attrs) {
141:         this(context, attrs, com.android.internal.R.attr.scrollViewStyle);
```

```
144:     public ScrollView(Context context, AttributeSet attrs, int defStyle) {
145:         super(context, attrs, defStyle);
```


03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?

Reverse Engineering

03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?

Reverse + Engineering

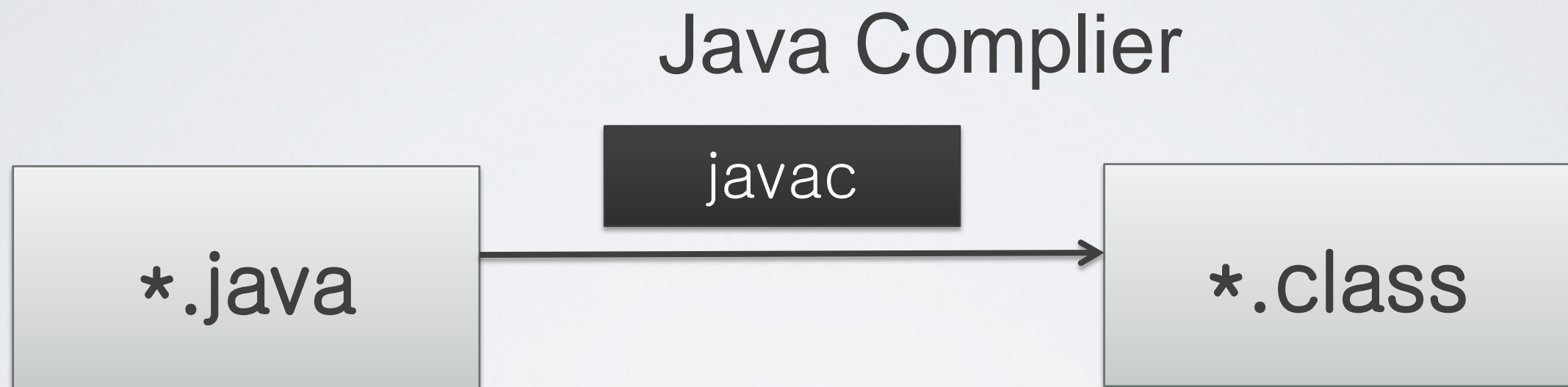
reverse 미국식 [rɪˈvɜːrs]  영국식 [rɪˈvɜːs]  ★★

1. (정반대로) 뒤바꾸다, 반전시키다
2. (결정 등을) 뒤집다
3. (앞뒤·순서 등을) 뒤집다

engineering 미국식 [ˌendʒɪˈnɪrɪŋ]  영국식 [ˌendʒɪˈnɪərɪŋ]  ★★

1. 공학 기술
2. 공학

03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?



03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?

*.class

Java Virtual Machine

03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?



Java De**co**mpiler

03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?

<http://java.decompiler.free.fr>



The image shows a screenshot of a web browser displaying the Java Decompiler website. The browser's address bar shows the URL <http://java.decompiler.free.fr/?q=jdgui>. The website has a dark header with the title "Java Decompiler" and the tagline "Yet another fast Java decompiler". Below the header is a navigation bar with links for "Home", "JD-GUI", and "JD-Eclipse". The main content area features a section titled "JD-GUI" with a description: "JD-GUI is a standalone graphical utility that displays Java source codes of '.class' files. You can browse the reconstructed source code with the JD-GUI for instant access to methods and fields." It also states that the tool is free for non-commercial use. Below this is a "Screenshots" section showing a screenshot of the JD-GUI application window. The application window has a menu bar (File, Edit, Navigate, Help) and a toolbar. It displays a project named "petstore-ejb3.0.jar" with a tree view on the left showing "META-INF" and "petstore". The right pane shows the decompiled source code for "EntityCategory.class". To the right of the website screenshot, there is a sidebar with sections titled "Suggestions", "Bugs & Issues", and "Donations". The "Suggestions" section asks if the user needs a new feature and provides a link to view suggestions. The "Bugs & Issues" section asks if the user found bugs and provides a link to the bug/issue tracker. The "Donations" section is partially visible at the bottom.

Java Decompiler
Yet another fast Java decompiler

Home JD-GUI JD-Eclipse

JD-GUI

JD-GUI is a standalone graphical utility that displays Java source codes of ".class" files. You can browse the reconstructed source code with the JD-GUI for instant access to methods and fields.

JD-GUI is free for non-commercial use. This means that JD-GUI shall not be included or embedded into commercial software products. Nevertheless, this project may be freely used for personal needs in a commercial or non-commercial environments.

Screenshots

Java Decompiler

File Edit Navigate Help

petstore-ejb3.0.jar x Object.class String.class CharSequence.class Integer.class

META-INF

EJBCatalogDAO.class EntityCategory.class x

Suggestions

Do you need a new feature? Check if it already proposed and vote for it.

Click here to view suggestions ➞

Bugs & Issues

Did you find bugs? Up to you to decide which one should be fixed first.

Click here to open bug/issue tracker ➞

Donations

03 Reverse Engineering 활용하여 학습하기, 리버스엔지니어링이 뭔가요?

```
1 class Test
2 {
3     public static void main(String[] args)
4     {
5         System.out.println("Hello World!");
6     }
7 }
```



Test.class



**자바 코드를 디컴파일하여,
원소스를 볼 수 있다.**

```
1 // Decompiled by Jad v1.5.8g. Copyright 2001 Pavel Kouznetsov
2 // Jad home page: http://www.kpdus.com/jad.html
3 // Decompiler options: packimports(3)
4 // Source File Name: Test.java
5
6 import java.io.PrintStream;
7
8 class Test
9 {
10
11     Test()
12     {
13     }
14
15     public static void main(String args[])
16     {
17         System.out.println("Hello World!");
18     }
19 }
```

03 Reverse Engineering 활용하여 학습하기, 어떻게 Android Application 리버싱하나요?



03 Reverse Engineering 활용하여 학습하기, 어떻게 Android Application 리버스싱하나요?

1. ApkTool

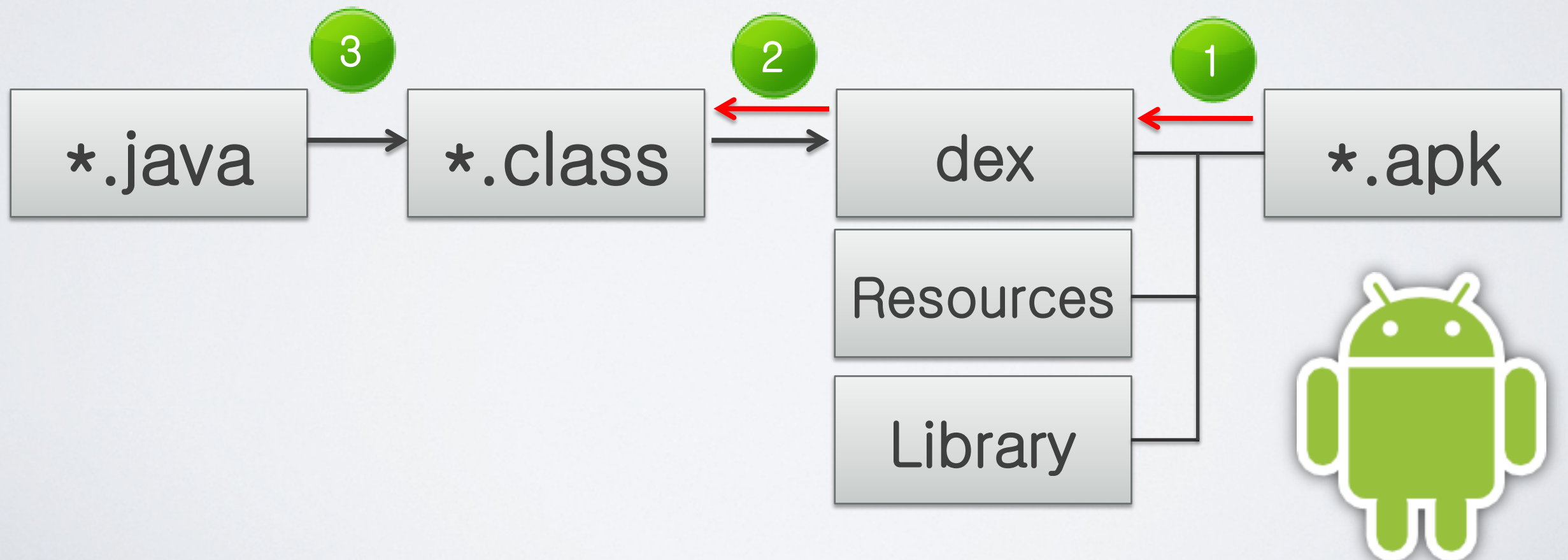
<http://code.google.com/p/android-apktool/>

2. Dex2Jar

<http://code.google.com/p/dex2jar/>

3. Java Decompiler

<http://java.decompiler.free.fr>



03 Reverse Engineering 활용하여 학습하기, 예제



Android Market



ANDROID 마켓 > 커뮤니케이션 > DOLPHIN BROWSER™ HD

Dolphin Browser™ HD

Dolphin Browser



★★★★★
(평가 61,420개)

설치

개발자의 콘텐츠 더보기



Dolphin Browser™ Mini

DOLPHIN BROWSER / 라이프스

★★★★★ (8,010)

무료



Dolphin Browser™

DOLPHIN BROWSER / 커뮤니케

★★★★★ (34,802)

무료

관련 항목



Dolphin Browser Licens

BANDS (BREAD & BUTTER) TC

개요

사용자 리뷰(1844개)

새로운 기능

권한

설명

Powerful, Fast & Elegant web browser for Android 2.0+. Browsing made wonderful.

돌핀 브라우저 HD의 다양한 기능을 활용해보세요.

- 파워풀한 Add-ons
- 북마크 폴더
- 멀티터치 핀치-줌
- 탭 브라우징
- 제스처 명령
- Rss 피드 감지
- 테마팩 지원
- 다국어 지원
- 강제종료탭 복구
- 그 외 여러가지!

한국어 번역에 도움주신 김민정(Sara Kim)님 감사합니다.

[개발자 웹사이트 방문 >](#)

애플리케이션 캡처 화면



Tweet

애플리케이션 정보

평점:

★★★★★
(61,420)

업데이트 날짜:

3월 12, 2011

현재 버전:

4.5.0

필요한 ANDROID 버전:

2.0 이상

카테고리:

커뮤니케이션

설치 횟수:

1,000,000 - 5,000,000

크기:

2.1M

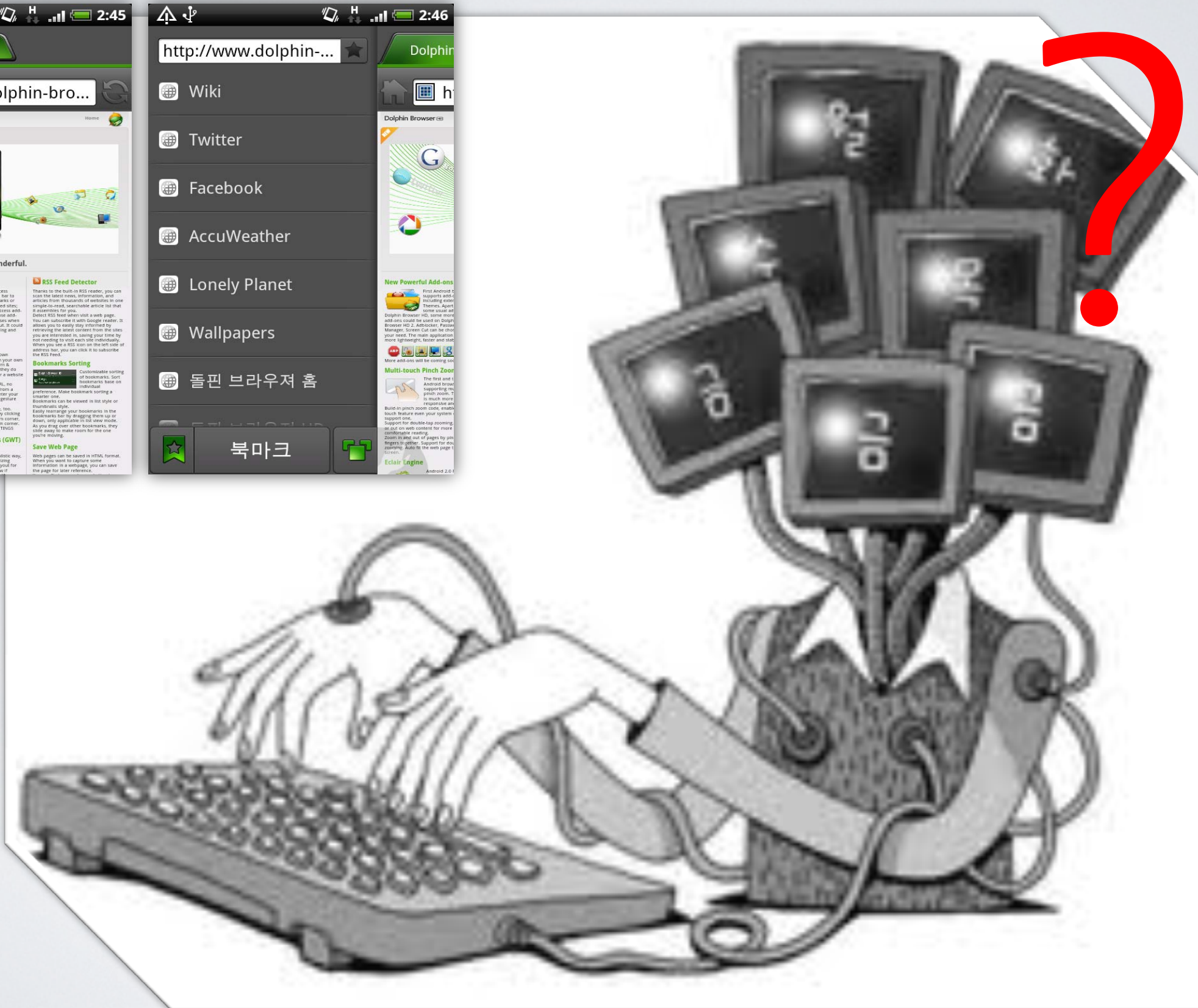
가격:

무료

03 Reverse Engineering 활용하여 학습하기, 예제



03 Reverse Engineering 활용하여 학습하기, 예제



준비물

1. Dolphin Browser APK 파일
2. Dex2Jar 툴
3. Java Decompiler 툴

03 Reverse Engineering 활용하여 학습하기, 예제

Firefox APK 파일 추출

```
C:\> 관리자: C:\Windows\system32\cmd.exe - adb shell
```

```
C:\Users\Administrator>adb shell
```

```
$ pm list packages -f_
```

03 Reverse Engineering 활용하여 학습하기, 예제

DolphinBrowser APK 파일 추출

```
선택 관리자: C:\Windows\system32\cmd.exe - adb shell

package:/system/app/TelephonyProvider.apk=com.android.providers.telephony
package:/system/app/PicoTts.apk=com.svox.pico
package:/data/app/net.cranix.android.cranixdialer-1.apk=net.cranix.android.cranixdialer
package:/data/app/com.google.android.apps.maps-2.apk=com.google.android.apps.maps
package:/system/app/MagicSmokeWallpapers.apk=com.android.magicsmoke
package:/system/app/SettingsProvider.apk=com.android.providers.settings
package:/data/app/mobi.mgeek.TunnyBrowser-1.apk=mobi.mgeek.TunnyBrowser
package:/data/app/com.curvefish.widgets.autorotateonoff-2.apk=com.curvefish.widgets.autorotateonoff
package:/data/app/com.android.ahnlabv3mobileplus-2.apk=com.android.ahnlabv3mobileplus
package:/system/app/HtcAddProgramWidget.apk=com.htc.AddProgramWidget
package:/system/app/HtcSyncwidget.apk=com.htc.htcsyncwidget
package:/system/app/RSS.apk=com.rosedata.android.rss
package:/system/app/DownloadProvider.apk=com.android.providers.downloads
package:/system/app/HtcStreamPlayer.apk=com.htc.streamplayer
package:/system/app/AccountSyncManager.apk=com.htc.settings.accountsync
package:/system/app/UpnServices.apk=com.android.server.vpn
package:/system/app/DCSUtility.apk=com.htc.dcs.service.utility
package:/system/app/Bosie.apk=com.htc.launcher
```

03 Reverse Engineering 활용하여 학습하기, 예제

Dolphin Browser APK 파일 추출

```
package:/system/app/MagicSmokeWallpapers.apk=com.android.magicsmoke
```

```
package:/data/app/mobi.mgeek.TunnyBrowser-1.apk=mobi.mgeek.TunnyBrowser
```




```
ets.autorotateonoff
```

```
C:\Users\Administrator\dolphin>adb pull /data/app/mobi.mgeek.TunnyBrowser-1.apk  
dolphin.zip  
1960 KB/s (2166658 bytes in 1.079s)
```

```
C:\Users\Administrator\dolphin>_
```

03 Reverse Engineering 활용하여 학습하기, 예제

DolphinBrowser APK 파일 추출

 저장된 게임	2011-01-20 오후 ...	파일 폴더
 즐겨찾기	2011-01-20 오후 ...	파일 폴더
 dolphin	2011-03-19 오전 ...	ALZip ZIP File

03 Reverse Engineering 활용하여 학습하기, 예제

Dex2Jar Tool 설치

<http://code.google.com/p/dex2jar/>

The screenshot shows the Google Code project page for dex2jar. The browser address bar displays the URL <http://code.google.com/p/dex2jar/>. The page header includes the project name 'dex2jar' and its description: 'A tool for converting Android's .dex format to Java's .class format'. A navigation bar contains links for 'Project Home', 'Downloads' (highlighted with a red box), 'Wiki', 'Issues', and 'Source'. Below the navigation bar, the 'About' section explains that the tool is used to convert Java .class files into the .dex format, which is required for running on Android mobile devices. It also includes a note in Chinese: '注意 请遵循Google相关协议和相关法律法规'.

Project Home **Downloads** Wiki Issues Source

Summary Updates People

Project Information

- Activity High
- [Project feeds](#)
- Code license**
[Apache License 2.0](#)
- Content license**
[Creative Commons 3.0 BY](#)
- Labels**
android, dex, dalvik, asm, reverse, dexdump
- Members**
[pxb1...@gmail.com](#)

About

Android mobile device runs applications which have been converted into a compact [Dalvik Executable \(.dex\) format](#).

A tool called dx is used to convert Java .class files into the .dex format.

But no tool convert the .dex files to Java .class files, so, i wrote dex2jar.

注意
请遵循Google相关协议和相关法律法规

03 Reverse Engineering 활용하여 학습하기, 예제

Dex2Jar Tool 설치

The screenshot shows the Google Code project page for dex2jar. The browser address bar displays 'code.google.com/p/dex2jar/downloads/list'. The page header includes the dex2jar logo and the description 'A tool for converting Android's .dex format to Java's .class format'. Navigation links for 'Project Home', 'Downloads', 'Wiki', 'Issues', and 'Source' are present. A search bar is also visible. The 'Downloads' section contains a table of available files, with the first row highlighted by a red rectangle.

Filename ▼	Summary + Labels ▼	Uploaded ▼	ReleaseDate ▼	Size ▼	DownloadCount ▼	...
dex2jar-0.0.7.8-SNAPSHOT.zip	dex2jar-0.0.7.8-SNAPSHOT Featured	Jan 3	Jan 3	579 KB	12546	
Dex2Jar_Handouts.zip	dalvik-bytecode & dex-format & instruction-formats	Jun 20 10		416 KB	1709	

1 - 2 of 2

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03 Reverse Engineering 활용하여 학습하기, 예제

Dex2Jar Tool 설치



The screenshot shows the Google Code project page for dex2jar. The browser address bar displays the URL: `code.google.com/p/dex2jar/downloads/detail?name=dex2jar-0.0.7.8-SNAPSHOT.zip&can=2&q=`. The page header includes the dex2jar logo and the description: "A tool for converting Android's .dex format to Java's .class format". Navigation links for "Project Home", "Downloads", "Wiki", "Issues", and "Source" are present. A search bar is also visible. The "Downloads" tab is selected, showing a list of download entries. The entry for "dex2jar-0.0.7.8-SNAPSHOT" is highlighted with a red box. This entry shows the file name "dex2jar-0.0.7.8-SNAPSHOT.zip" with a size of 579 KB. Below the file name, there is a description in Korean and English, a SHA1 checksum, and a QR code.

Download: dex2jar-0.0.7.8-SNAPSHOT
5 people starred this download

Uploaded by: [pxb1...@gmail.com](#)
Released: , 2011
Uploaded: Jan 3, 2011
Downloads: 12546
Featured







File: [dex2jar-0.0.7.8-SNAPSHOT.zip](#) 579 KB

Description:
1. 解决生成的class文件使用 invoke-direct 而不是 invoke-super 的问题 (未使用 invoke-super 而使用了 invoke-direct)
2. Fixes issue 38
3. 根据变量的类型重新编号 Fixes issue 36
4. 修复在分析指令时死循环的问题 Fixes issue 33

SHA1 Checksum: 0988f9fe68c440b4c1f61d683a1c77e9d96eb543 [What's this?](#)



Dex2Jar Tool 설치

이름 ▲	수정한 날짜	유형
 lib	2011-03-18 오후 ...	파일 폴더
 dex2jar	2010-12-03 오후 ...	Windows 배치 ...
 dex2jar.sh	2010-12-03 오후 ...	SH 파일
 dex2jar-dump	2010-12-03 오후 ...	Windows 배치 ...
 dex2jar-dump.sh	2010-12-03 오후 ...	SH 파일
 setclasspath	2010-12-03 오후 ...	Windows 배치 ...

03 Reverse Engineering 활용하여 학습하기, 예제

저장된 게임

2011-01-20 오후 ... 파일 폴더

즐거찾기

2011-01-20 오후 ... 파일 폴더

ZIP dolphin

unzip

파일명

assets

META-INF

res

AndroidManifest.xml

classes.dex

resources.arsc

03 Reverse Engineering 활용하여 학습하기, 예제

Dex2Jar 실행

```
C:\Users\Administrator\dolphin>dex2jar classes.dex
version:0.0.7.8-SNAPSHOT
2 [main] INFO pxb.android.dex2jar.v3.Main - dex2jar classes.dex -> classes.dex.d
ex2jar.jar
Done.
```

03 Reverse Engineering 활용하여 학습하기, 예제

assets
META-INF
res
AndroidManifest.xml
classes.dex
resources.arsc

dex2jar

assets
META-INF
res
AndroidManifest
classes.dex
JAR classes.dex.dex2jar
resources.arsc

03 Reverse Engineering 활용하여 학습하기, 예제

JD-GUI 설치

<http://java.decompiler.free.fr>



The image shows a web browser window displaying the JD-GUI website. The browser's address bar shows the URL `java.decompiler.free.fr/?q=jdgui`. The website has a header with the title "Java Decompiler" and the tagline "Yet another fast Java decompiler". Below the header is a navigation bar with links for "Home", "JD-GUI", and "JD-Eclipse". The main content area is titled "JD-GUI" and contains a description of the utility, its license, and a section for "Screenshots". The "Screenshots" section shows a window titled "Java Decompiler" with a menu bar (File, Edit, Navigate, Help) and a toolbar. The window displays a list of loaded classes, including "petstore-ejb3.0.jar", "Object.class", "String.class", "CharSequence.class", "Integer.class", "META-INF", "EJBCatalogDAO.class", and "EntityCategory.class".

Java Decompiler
Yet another fast Java decompiler

Home JD-GUI JD-Eclipse

JD-GUI

JD-GUI is a standalone graphical utility that displays Java source codes of ".class" files. You can browse the reconstructed source code with the JD-GUI for instant access to methods and fields.

JD-GUI is free for non-commercial use. This means that JD-GUI shall not be included or embedded into commercial software products. Nevertheless, this project may be freely used for personal needs in a commercial or non-commercial environments.

Screenshots



Java Decompiler
File Edit Navigate Help

petstore-ejb3.0.jar x Object.class String.class CharSequence.class Integer.class

META-INF EJBCatalogDAO.class EntityCategory.class x

Suggestions

Do you need a new feature? Check if it already proposed and vote for it.

[Click here to view suggestions](#)

Bugs & Issues

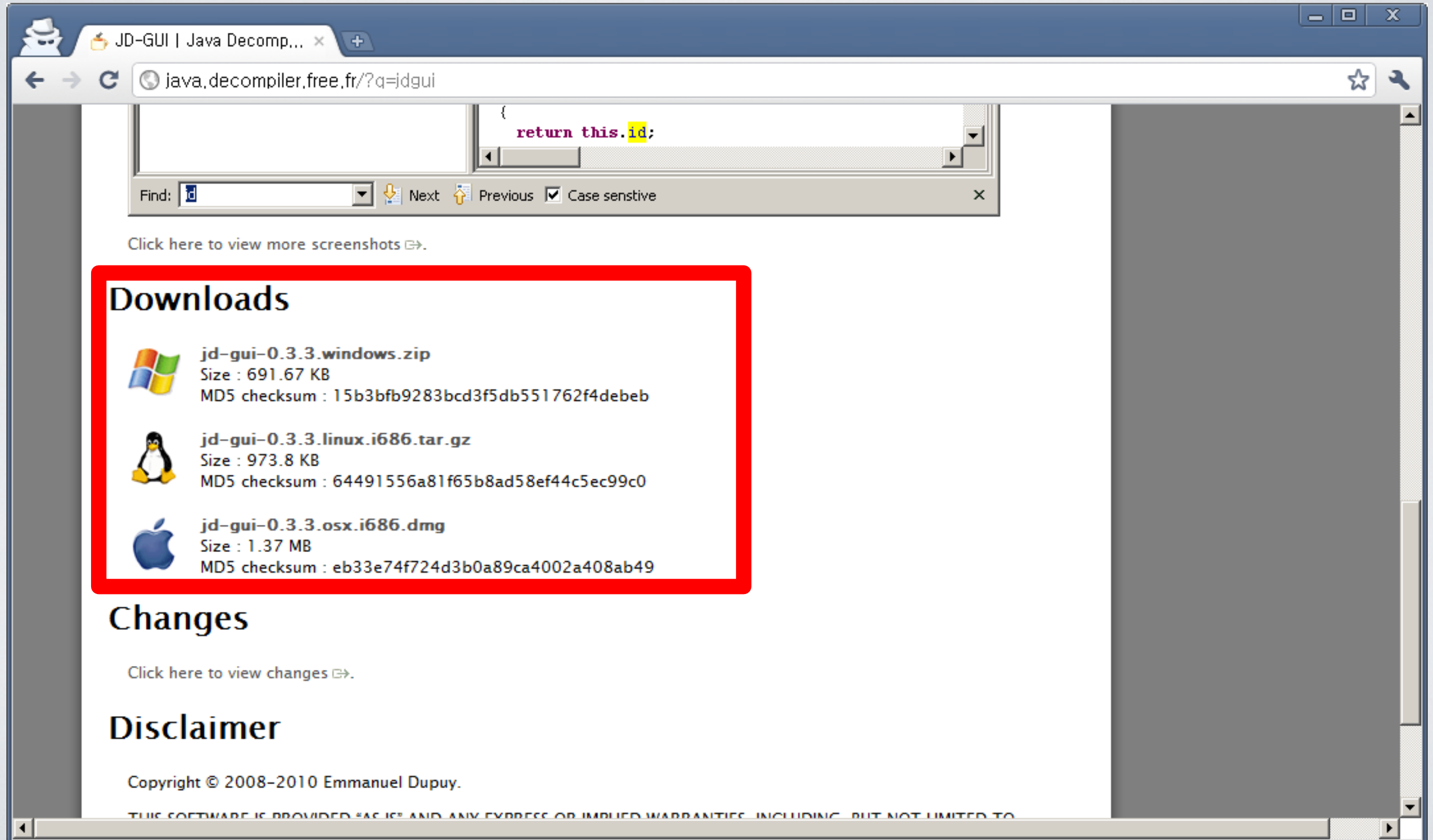
Did you find bugs? Up to you to decide which one should be fixed first.

[Click here to open bug/issue tracker](#)

Donations

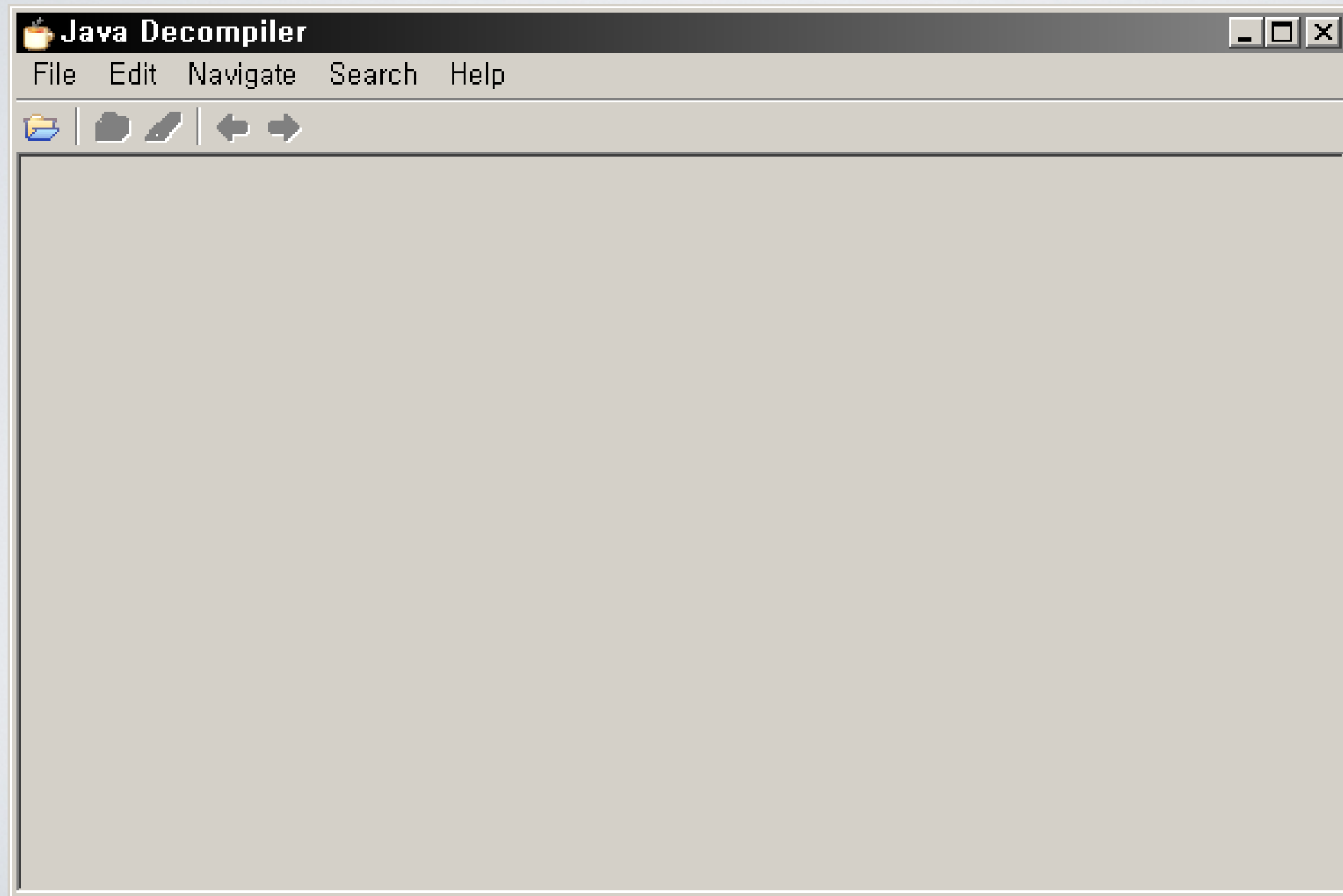
03 Reverse Engineering 활용하여 학습하기, 예제

JD-GUI 설치



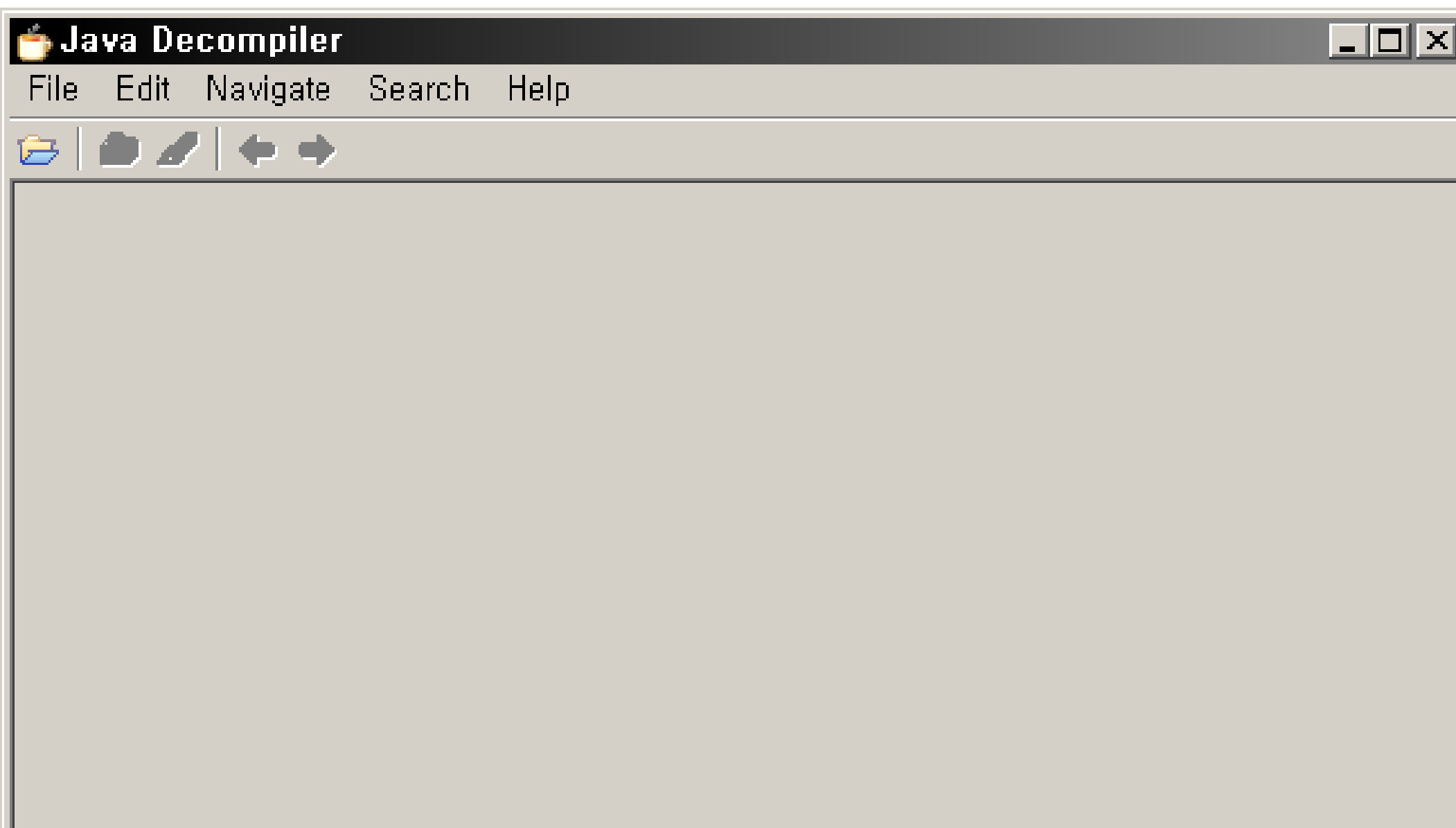
03 Reverse Engineering 활용하여 학습하기, 예제

JD-GUI 실행



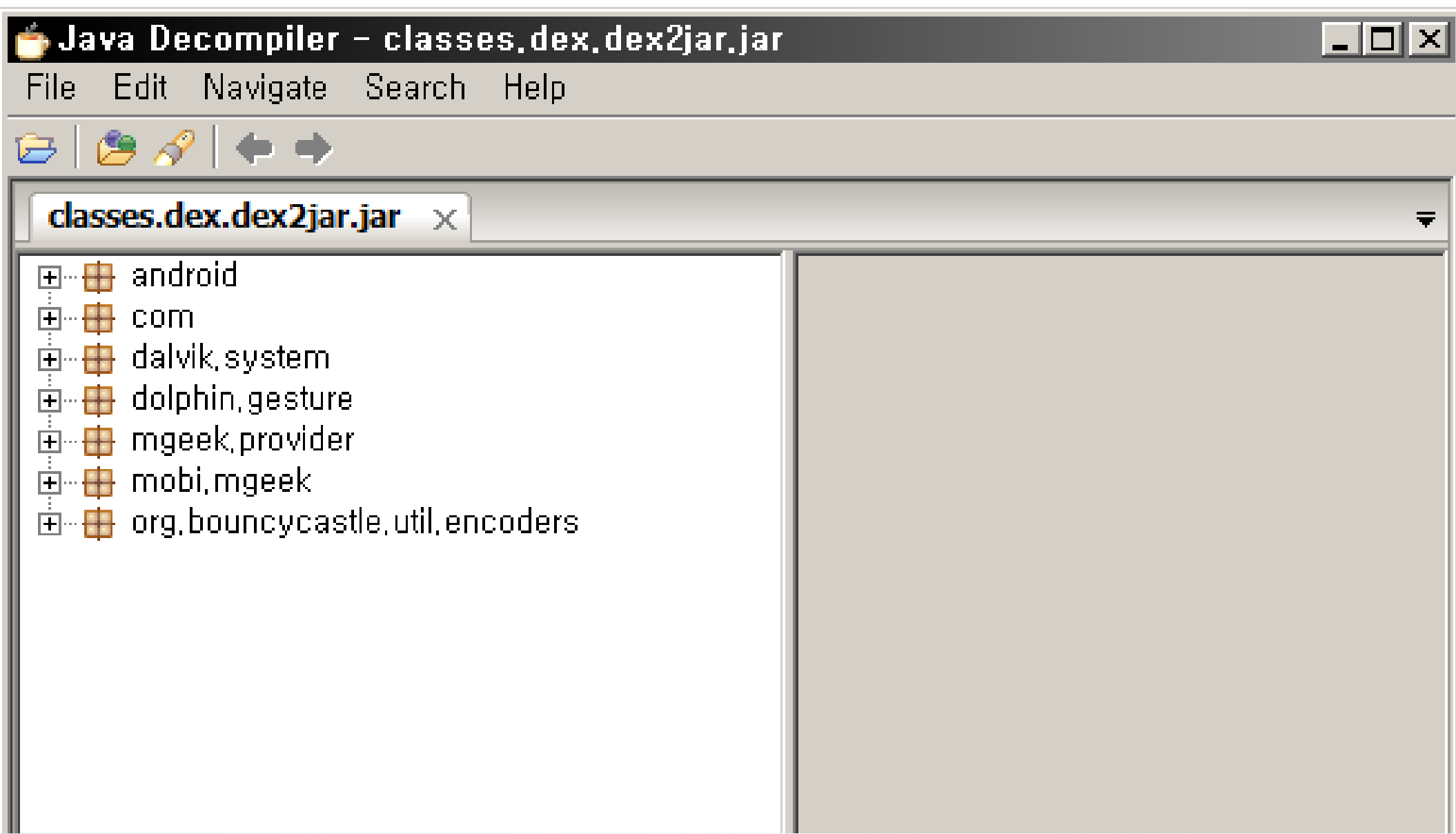
03 Reverse Engineering 활용하여 학습하기, 예제

 assets	2011-03-19 오전 ...	파일 폴더	
 META-INF	2011-03-19 오전 ...	파일 폴더	
 res	2011-03-19 오전 ...	파일 폴더	
 AndroidManifest	2011-03-12 오후 ...	XML 문서	23KB
 classes.dex	2011-03-12 오후 ...	DEX 파일	1,233KB
 classes.dex.dex2jar	2011-03-19 오전 ...	ALZip JAR File	1,128KB
 resources.arsc	2011-03-12 오후 ...	ARSC 파일	951KB

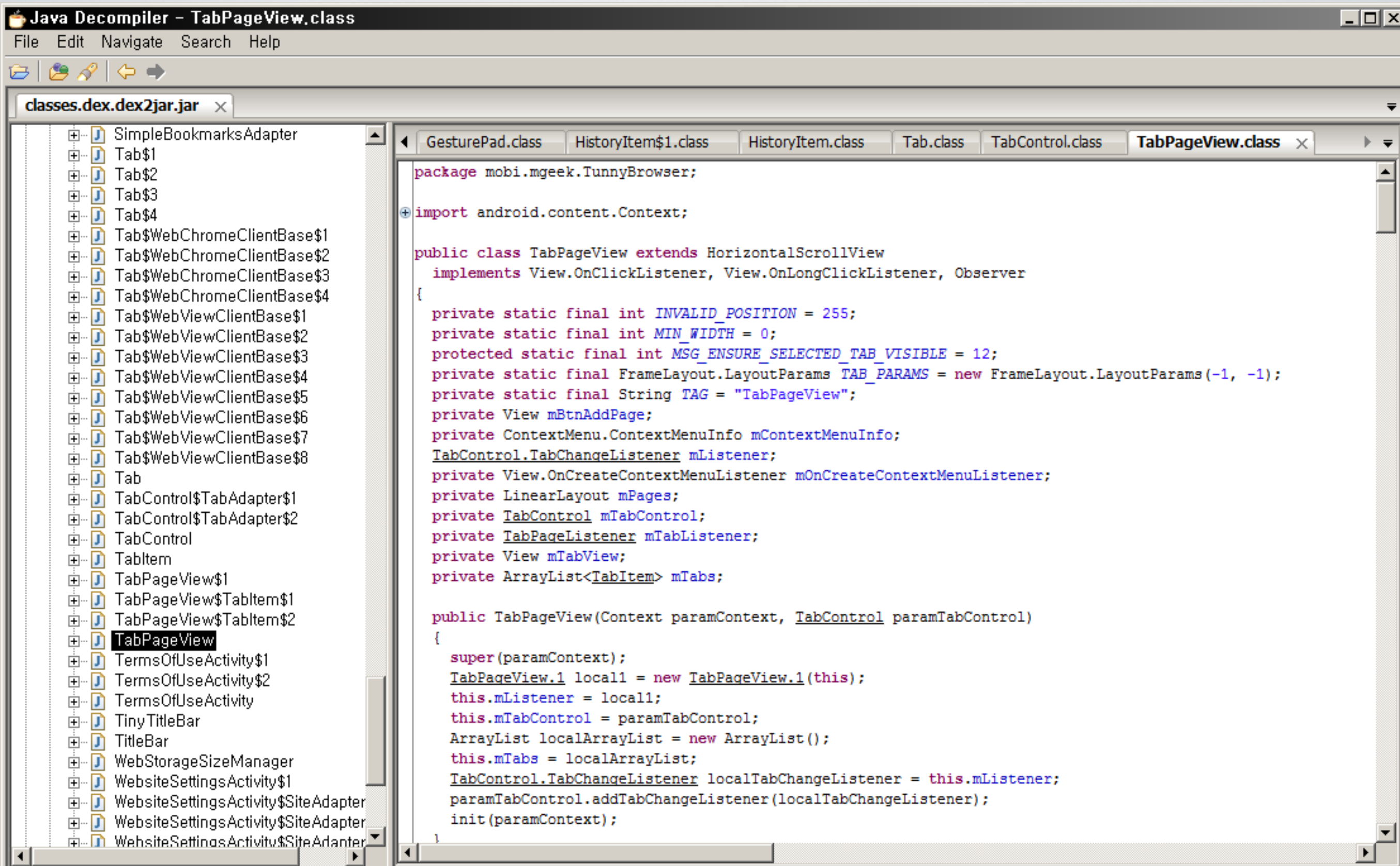


03 Reverse Engineering 활용하여 학습하기, 예제

 assets	2011-03-19 오전 ...	파일 폴더	
 META-INF	2011-03-19 오전 ...	파일 폴더	
 res	2011-03-19 오전 ...	파일 폴더	
 AndroidManifest	2011-03-12 오후 ...	XML 문서	23KB
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03 Reverse Engineering 활용하여 학습하기, 예제



Java Decompiler - TabPageView.class

File Edit Navigate Search Help

classes.dex.dex2jar.jar

SimpleBookmarksAdapter
Tab\$1
Tab\$2
Tab\$3
Tab\$4
Tab\$WebChromeClientBase\$1
Tab\$WebChromeClientBase\$2
Tab\$WebChromeClientBase\$3
Tab\$WebChromeClientBase\$4
Tab\$WebViewClientBase\$1
Tab\$WebViewClientBase\$2
Tab\$WebViewClientBase\$3
Tab\$WebViewClientBase\$4
Tab\$WebViewClientBase\$5
Tab\$WebViewClientBase\$6
Tab\$WebViewClientBase\$7
Tab\$WebViewClientBase\$8
Tab
TabControl\$TabAdapter\$1
TabControl\$TabAdapter\$2
TabControl
TabItem
TabPageView\$1
TabPageView\$TabItem\$1
TabPageView\$TabItem\$2
TabPageView
TermsOfUseActivity\$1
TermsOfUseActivity\$2
TermsOfUseActivity
TinyTitleBar
TitleBar
WebStorageSizeManager
WebsiteSettingsActivity\$1
WebsiteSettingsActivity\$SiteAdapter
WebsiteSettingsActivity\$SiteAdapter
WebsiteSettingsActivity\$SiteAdapter

GesturePad.class HistoryItem\$1.class HistoryItem.class Tab.class TabControl.class **TabPageView.class**

```
package mobi.mgeek.TunnyBrowser;

import android.content.Context;

public class TabPageView extends HorizontalScrollView
    implements View.OnClickListener, View.OnLongClickListener, Observer
{
    private static final int INVALID_POSITION = 255;
    private static final int MIN_WIDTH = 0;
    protected static final int MSG_ENSURE_SELECTED_TAB_VISIBLE = 12;
    private static final FrameLayout.LayoutParams TAB_PARAMS = new FrameLayout.LayoutParams(-1, -1);
    private static final String TAG = "TabPageView";
    private View mBtnAddPage;
    private ContextMenu.ContextMenuInfo mContextMenuInfo;
    TabControl.TabChangeListener mListener;
    private View.OnCreateContextMenuListener mOnCreateContextMenuListener;
    private LinearLayout mPages;
    private TabControl mTabControl;
    private TabPageListener mTabListener;
    private View mTabView;
    private ArrayList<TabItem> mTabs;

    public TabPageView(Context paramContext, TabControl paramTabControl)
    {
        super(paramContext);
        TabPageView.1 local1 = new TabPageView.1(this);
        this.mListener = local1;
        this.mTabControl = paramTabControl;
        ArrayList localArrayList = new ArrayList();
        this.mTabs = localArrayList;
        TabControl.TabChangeListener localTabChangeListener = this.mListener;
        paramTabControl.addTabChangeListener(localTabChangeListener);
        init(paramContext);
    }
}
```


03 Reverse Engineering 활용하여 학습하기, 예제

열심히 분석...

03 Reverse Engineering 활용하여 학습하기, 예제

```
package mobi.mgeek.TunnyBrowser;

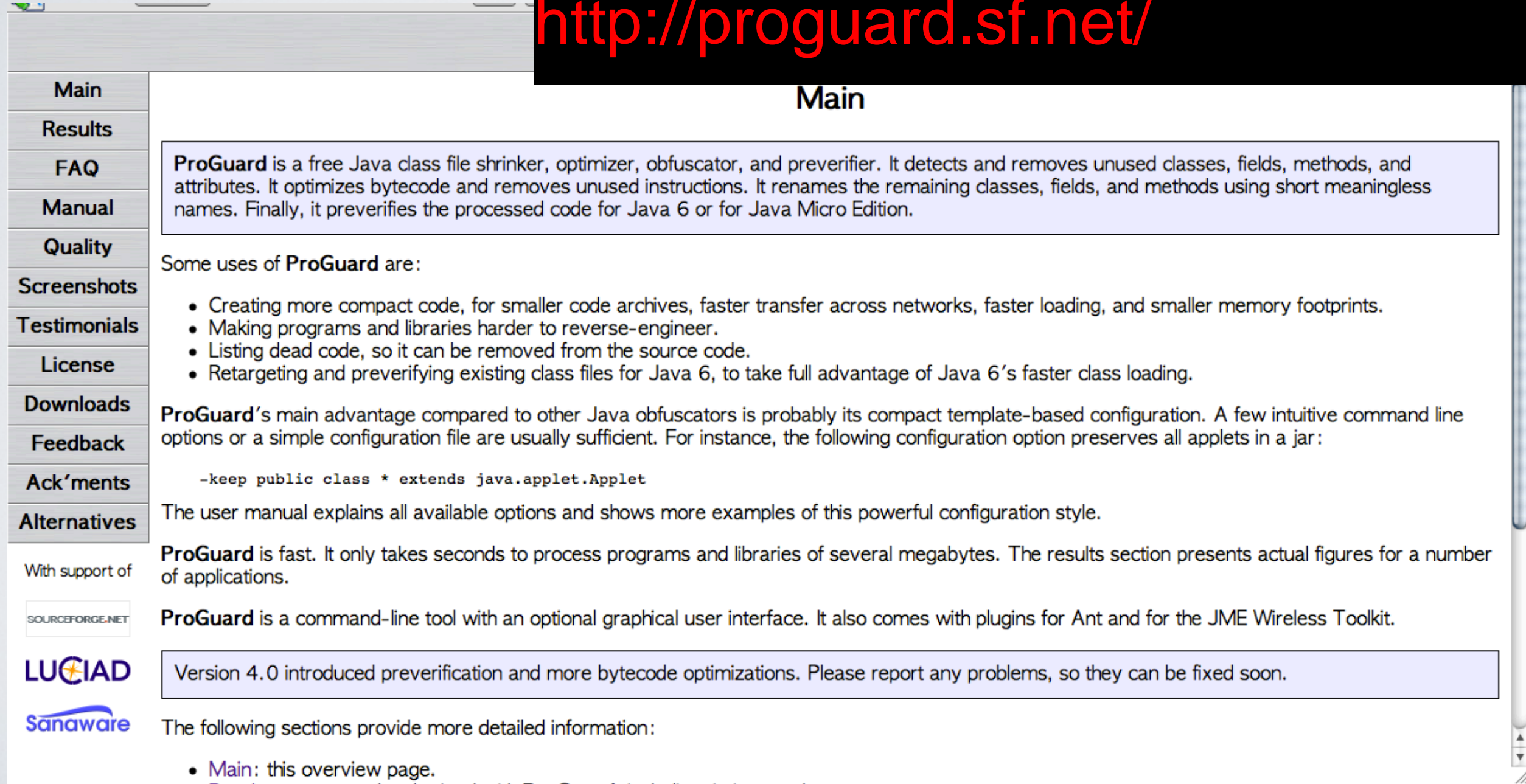
import android.content.Context;

public class TabPageView extends HorizontalScrollView
    implements View.OnClickListener, View.OnLongClickListener, Observer
{
    private static final int INVALID_POSITION = 255;
    private static final int MIN_WIDTH = 0;
    protected static final int MSG_ENSURE_SELECTED_TAB_VISIBLE = 12;
    private static final FrameLayout.LayoutParams TAB_PARAMS = new FrameLayout.LayoutParams(-1, -1);
    private static final String TAG = "TabPageView";
    private View mBtnAddPage;
    private ContextMenu.ContextMenuInfo mContextMenuInfo;
    TabControl.TabChangeListener mListener;
    private View.OnCreateContextMenuListener mOnCreateContextMenuListener;
    private LinearLayout mPages;
    private TabControl mTabControl;
    private TabPageListener mTabListener;
    private View mTabView;
    private ArrayList<TabItem> mTabs;
```

03 Reverse Engineering,

proguard

<http://proguard.sf.net/>

A screenshot of the ProGuard website. The page has a left sidebar with a navigation menu containing links: Main, Results, FAQ, Manual, Quality, Screenshots, Testimonials, License, Downloads, Feedback, Ack'ments, and Alternatives. The main content area is titled 'Main' and contains a description of ProGuard as a free Java class file shrinker, optimizer, obfuscator, and preverifier. It lists some uses of ProGuard, such as creating compact code and making programs harder to reverse-engineer. It also mentions ProGuard's main advantage compared to other Java obfuscators is its compact template-based configuration. A sample configuration option is shown: `-keep public class * extends java.applet.Applet`. The page notes that the user manual explains all available options and shows more examples of this configuration style. It states that ProGuard is fast, taking only seconds to process programs and libraries of several megabytes. The results section presents actual figures for a number of applications. ProGuard is described as a command-line tool with an optional graphical user interface, also coming with plugins for Ant and for the JME Wireless Toolkit. A version 4.0 update note mentions preverification and more bytecode optimizations. The page concludes by stating that the following sections provide more detailed information, with a link to the 'Main' section (this overview page).

Main

ProGuard is a free Java class file shrinker, optimizer, obfuscator, and preverifier. It detects and removes unused classes, fields, methods, and attributes. It optimizes bytecode and removes unused instructions. It renames the remaining classes, fields, and methods using short meaningless names. Finally, it preverifies the processed code for Java 6 or for Java Micro Edition.

Some uses of **ProGuard** are:

- Creating more compact code, for smaller code archives, faster transfer across networks, faster loading, and smaller memory footprints.
- Making programs and libraries harder to reverse-engineer.
- Listing dead code, so it can be removed from the source code.
- Retargeting and preverifying existing class files for Java 6, to take full advantage of Java 6's faster class loading.

ProGuard's main advantage compared to other Java obfuscators is probably its compact template-based configuration. A few intuitive command line options or a simple configuration file are usually sufficient. For instance, the following configuration option preserves all applets in a jar:

```
-keep public class * extends java.applet.Applet
```

The user manual explains all available options and shows more examples of this powerful configuration style.

ProGuard is fast. It only takes seconds to process programs and libraries of several megabytes. The results section presents actual figures for a number of applications.

ProGuard is a command-line tool with an optional graphical user interface. It also comes with plugins for Ant and for the JME Wireless Toolkit.

Version 4.0 introduced preverification and more bytecode optimizations. Please report any problems, so they can be fixed soon.

The following sections provide more detailed information:

- [Main](#): this overview page.

04 Summary



아!! 이걸 이렇게 만든 거구나...
Reverse Engineering 활용하여
안드로이드를 학습할 수 있음!!

04 Summary

Reverse Engineering,
안드로이드 학습

모두 웃을 수 있길 기원합니다!



Q & A

질의응답

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Mail : moleskine7@gmail.com

Blog : <http://softwaregeeks.org>

Thank you!

:D