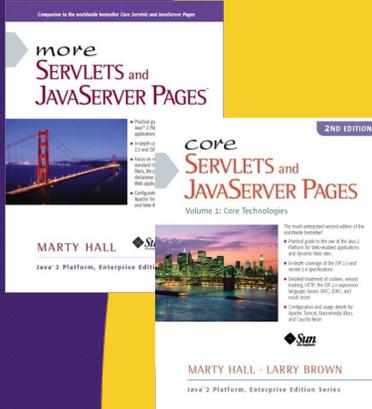




# Official Android Coding Style Conventions

Originals of Slides and Source Code for Examples:  
<http://www.coreservlets.com/android-tutorial/>

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**For live Android training, please see courses at <http://courses.coreservlets.com/>.**

**Taught by the author of *Core Servlets and JSP*, *More Servlets and JSP*, and this Android tutorial. Available at public venues, or customized versions can be held on-site at your organization.**



- Courses developed and taught by Marty Hall
    - JSF 2, PrimeFaces, servlets/JSP, Ajax, jQuery, Android development, Java 6 or 7 programming, custom mix of topics
    - Ajax courses can concentrate on 1 library (jQuery, Prototype/Scriptaculous, Ext-JS, Dojo, etc.) or survey several
  - Courses developed and taught by coreservlets.com experts (edited by Marty)
    - Spring, Hibernate/JPA, EJB3, GWT, Hadoop, SOAP-based and RESTful Web Services
- Contact [hall@coreservlets.com](mailto:hall@coreservlets.com) for details

# Topics in This Section

- **Why follow conventions?**
- **Valuable conventions**
  - Ones that are widely considered good practice for any Java project (based on general Java industry consensus)
- **Tolerable conventions**
  - Ones that do no harm, but are of questionable value (in Marty's highly subjective opinion)
- **Dubious conventions**
  - Ones that we would have been better off without (in Marty's highly subjective opinion)

5

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## Overview

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# Official Android Code Conventions

- **Required for**
  - Code contributed to Android project
- **Used in**
  - All official tutorials and (supposedly) all source code
- **Suggested for**
  - Code submitted to the app store
  - Any Android project
- **Details**
  - <http://source.android.com/source/code-style.html>
- **Eclipse preferences file**
  - Downloadable from [coreservlets.com](http://coreservlets.com) from this section of the Android Tutorial.
    - Sets spacing, brace style, and use of @Override

7

# Pros and Cons of Following Conventions

- **Pros**
  - Consistent with official tutorials and Android source
  - More familiar to Android developers who join your team
- **Cons**
  - Inconsistent with Java code you wrote before
  - Less familiar to other Java developers
  - Simply bothers you.
    - Java developers often have strong personal preferences
- **My recommendations**
  - Most conventions are best practices anyhow
    - Definitely follow those
  - Most others are neither worse nor better than alternatives
    - Probably follow those
  - A few are (arguably) bad or at least wrong in some situations
    - Ignore those if the situation warrants it

8



## Conventions that are Good Standard Practice (For any Java project)

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## Indentation: blocks that are nested more should be indented more

- Yes

```
blah;  
blah;  
for(...) {  
    blah;  
    blah;  
    for(...) {  
        blah;  
        blah;  
    }  
}
```

- No

```
blah;  
blah;  
for(...) {  
    blah;  
    blah;  
    for(...) {  
    blah;  
    blah;  
    }  
}
```

## Indentation: blocks that are nested the same should be indented the same

- Yes

```
blah;  
blah;  
for(...) {  
    blah;  
    blah;  
    for(...) {  
        blah;  
        blah;  
    }  
}
```

- No

```
blah;  
    blah;  
for(...) {  
    blah;  
    blah;  
    for(...) {  
        blah;  
        blah;  
    }  
}
```

11

## Break Things into Small Pieces

- **Write short methods**

- No official limit, but try to keep methods short and focused. Think often about how to refactor your code to break it into smaller and more reusable pieces.
  - This is good advice in any language.
  - This also shows why overly strict rules on the length of comments can be counter productive by encouraging developers to write long methods to avoid writing docs.

- **Keep lines short**

- They have a strict rule of 100 characters except for imports or comments that contain URLs or commands that cannot be broken up.
  - Not sure 100 is the magic number, but short lines are good practice anyhow.

12

# Follow Normal Capitalization Rules

- **Classes start with uppercase letter**  
`public class SomeClass { ... }`
- **Constants use all caps**  
`public static final double GOLDEN_RATIO =  
(1 + Math.sqrt(5.0))/2;`
- **Everything else starts with lowercase letter**
  - Instance variables, local variables, parameters to methods, package names
- **Extra rule**
  - Use words for acronyms, not all uppercase
    - `getUrl`, not `getURL`
      - This is good advice in Web apps also

13

# Use JavaDoc

- **Use JavaDoc from the beginning**
  - Don't wait until the code is finished. Short comments are fine, but use *some*. Explain purpose and non-obvious behavior. Don't explain standard Java constructs.
- **Document every class**  
`/** Represents a collection of Blahs. Used to ... */  
public class Foo { ... }`
- **Document anything public**
  - Methods
  - Constructors
  - Instance variables (but *very* rare to have public ones)
- **Review Oracle JavaDoc guidelines**
  - <http://www.oracle.com/technetwork/java/javase/documentation/index-137868.html>

14

## Use @Override

- **Use @Override when you override methods from parent class**

- Won't be caught until run time

```
public void onCreate(Bundle savedInstanceState) {  
    ...  
}
```

- Will be caught at compile time

```
@Override  
public void onCreate(Bundle savedInstanceState) {  
    ...  
}
```

- **Guidelines are silent regarding interfaces**

- But, in Java 6 or later, I prefer to also use @Override when implementing methods from interface

15

## Use Other Standard Annotations when Warranted (but Rarely)

- **@Deprecated**

- If you use a deprecated method, add this annotation to your method. Also add @deprecated JavaDoc tag explaining why it was necessary to use deprecated code.
  - Of course, try hard to avoid use of deprecated methods

- **@SuppressWarnings**

- Generic collections are prohibited from doing extra work at run time, so casting to generic type can cause warning that Java can't verify the types. Sometimes unavoidable
  - @SuppressWarnings("unchecked")
  - Other similar situations when *making* generic types
- Android guidelines require a TODO comment in these cases, saying why you cannot avoid the situation

16

## Limit the Scope of Variables

- **Use narrowest scope possible**

- Variables should be declared in the innermost block that encloses all uses of the variable.
  - E.g., if variable is only used inside if statement, declare it inside if statement.
- Yes

```
if (...) {
    double d = someCalculation(...);
    doSomethingWith(d);
} else {
    // No use of d
}
```
- No

```
double d = 0;
if (...) { ... } else { ... }
```

17

## Initialize Local Variables when Declared

- **Initialize (almost) all local variables**

- Yes

```
String s = "Hello";
```
- No

```
String s;
...
s = "Hello";
```
- Exception: try/catch blocks

```
int n;
try {
    n = Integer.parseInt(someString);
} catch (NumberFormatException nfe) {
    n = 10;
}
```

18

## Put Braces on Conditionals

- **Always use braces for if statements**
  - Even if there is only one thing to do
    - Yes

```
if (...) {
    doSomething();
}
```
    - No

```
if (...)
    doSomething();
```
- **Guidelines give small exception**
  - If there is only one thing to do *and* it is all on one line
    - Tolerated (grudgingly?)

```
if (...) doSomething();
```

19

## Use TODO Comments for Temporary Code

- **Use “// TODO: ... ” for code that needs to be changed later**
  - Situations
    - Temporary fix
    - OK but not great
    - Works for small sizes, but bad performance in future when data sets get bigger.
  - Examples:

```
// TODO: Switch to a Map when you have more entries
// TODO: Remove after UriTable2 has been checked in
```
- **Eclipse note**
  - Eclipse puts TODO in bold and puts check mark in left margin of code

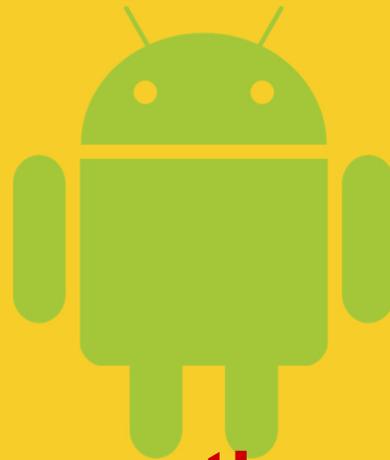
20

# Avoid Finalizers

- **Do not use finalize()**
  - Idea
    - finalize() gets called when an object is garbage collected, so you can do cleanup work then (such as closing socket connections)
  - Problem
    - No guarantee when (or even if) finalizer will be called
  - Guidelines
    - Don't use them.
- **Good news**
  - Finalizers have long ago fallen out of favor, and many Java developers don't even know what they are.

21

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**Conventions that  
Don't Hurt**  
(No harm in following them, but  
their value is questionable)

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## Put Open Braces with Preceding Code

- Put { with previous line, not on its own line

– Yes

```
public void foo() {  
    if (...) {  
        doSomething();  
    }  
}
```

– No

```
public void foo()  
{  
    if (...)  
    {  
        doSomething();  
    }  
}
```

23

## Indent 4 Spaces for Blocks

- Indent 4 spaces when starting a block

– Yes

```
public void foo() {  
    if (...) {  
        doSomething();  
    }  
}
```

– No

```
public void foo() {  
    if (...) {  
        doSomething();  
    }  
}
```

24

## Indent 8 Spaces for Lines

- **Indent 8 spaces when splitting a line**

- Yes

```
String s =  
    somethingVeryLong (...);
```

- No

```
String s =  
somethingVeryLong (...);
```

25

## Fully Qualify Imports

- **List each class name; don't use \***

- Yes

- import android.widget.Button;
    - import android.widget.CheckBox;
    - import android.widget.EditText;

- No

- import android.widget.\*;

- **Exception**

- Can use \* for java or javax packages

- Permitted
      - import java.util.\*;

26

# Order Import Statements

- **First**
  - Android packages
    - `import android.foo.Bar;`
- **Second**
  - Third party packages
    - `import com.coreservlets.utils.RandomUtils;`
- **Third**
  - Standard java or javax packages
    - `import java.util.*;`
- **Within each group**
  - Alphabetical (uppercase Z before lowercase a)
- **Separating groups**
  - Blank line between each major grouping

27

# Start JavaDoc Comments with 3<sup>rd</sup> Person Verb

- **Examples**
  - Yes
    - Represents a ...
    - Responds to mouse clicks with ...
    - Deletes ...
  - No
    - This class ...
    - This method ...
- **Android's own docs are inconsistent**
  - Many (most?) classes start with "This class" or similar.
    - E.g., View, Activity, LinearLayout

28



# Questionable Conventions (You would have been better off without them)

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## Start Instance Variables with “m” (normal) or “s” (static)

- **Use “m” for non-public, non static fields**
  - “m” for “member variable” or “data member”
    - Yes
      - `private String mFirstName;`
      - `private boolean mIsMarried;`
    - No
      - `private String firstName;`
      - `private boolean isMarried;`
- **Use “s” for static (non-final) fields**
  - Yes
    - `private static double sBiggestRadius;`
  - No
    - `private static double biggestRadius;`
- **Marty’s opinion**
  - Results in less readable names with no real benefit

# Impact of Naming Convention on Constructors

## Standard Style

```
public class Person {
    public String firstName, lastName;

    public Person(String firstName,
                  String lastName) {
        this.firstName = firstName;
        this.lastName = lastName;
    }

    ...
}
```

## Android Style

```
public class Person {
    public String mFirstName, mLastName;

    public Person(String firstName,
                  String lastName) {
        mFirstName = firstName;
        mLastName = lastName;
    }

    ...
}
```

31

# Never Ignore Exceptions

- **Avoid empty catch blocks**

- Yes

```
try {
    ...
} catch(SomeException se) {
    doSomethingReal();
}
```

- No

```
try {
    ...
} catch(SomeException se) { }
```

- Marty's opinion

- Usually, but not *a/ways*, a good rule

32

## Why Ignoring Exceptions Rule is Too Strict

- **Can make shorter code with same safety**

- Android style

```
int n;  
try {  
    n = Integer.parseInt(...);  
} catch(NumberFormatException nfe) {  
    n = 10;  
}
```

- Shorter style if you could ignore exceptions

```
int n = 10;  
try {  
    n = Integer.parseInt(...);  
} catch(NumberFormatException nfe) { }
```

33

## Why Ignoring Exceptions Rule is Too Strict (Continued)

- **Sometimes there is nothing to be done**

```
try {  
    Thread.sleep(...);  
} catch(InterruptedException ie) {  
    // What could you do here?  
}  
doSomethingAfterThePause();
```

34

# Don't Catch Generic Exception

- **List each Exception type**

- Yes

```
try {
    ...
} catch(ExceptionType1 et1) {
    ...
} catch(ExceptionType2 et2) {
    ...
}
```
- No

```
try {
    ...
} catch(Exception e) {
    ...
}
```

35

# Why Generic Exception Rule is (Arguably) Too Strict

- **Listing each type is almost always best**
  - So exceptions you didn't expect don't get caught there
  - So real failure-handling is not obscured
- **Sometimes combining is concise and safe**
  - E.g., if someString could be null, you could have either NumberFormatException or NullPointerException. But, in both cases, you just want to use original value for n.

```
int n = 10;
try {
    n = Integer.parseInt(someString);
} catch(Exception e) { }
```

36



## Wrap-Up

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## Summary

- **Strictly follow conventions that reflect widely accepted best practices**
  - Also, familiarize yourself with best practices.
    - All developers who have worked with Java more than two years full time should read Josh Bloch's *Effective Java* (2<sup>nd</sup> Edition).
      - Even experts will learn something new and valuable
- **For other conventions, if you don't strongly object, follow the conventions anyhow**
  - Even if you don't see any real value
- **If convention really bothers you, ignore it**
  - Assuming it is not in category of generally accepted best practices. Personal taste plays role in many of them.



# Questions?

JSF 2, PrimeFaces, Java 7, Ajax, jQuery, Hadoop, RESTful Web Services, Android, Spring, Hibernate, Servlets, JSP, GWT, and other Java EE training.

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