Victoria University
of Wellington, New Zealand
Te Whare Wananga o te
Upoko o te Ika a Maui
Aotearoa

SWEN221: Software Development
#4 - Style

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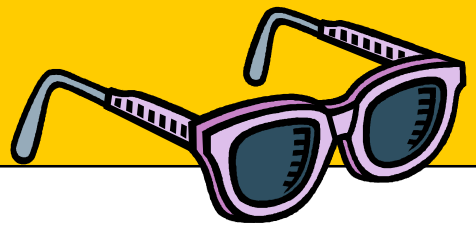
Why bother with style?



- Java allows you to write code that is very easy/hard to understand
- The aim of code, comments, diagrams, documentation is **to communicate**
  - With yourself
  - With your team
  - With those who will come after you
- Style guide helps to produce code that is clear and consistent and thus easier to read and maintain

Files & Comments

- Files:
  - Organise them according to Java conventions
  - Eclipse will do this for you!
- Comments:
  - **`/** Javadoc comment **/, /* */ or //`**
- Tips
  - Good code does not need many comments
    - Good names (variable, class, field etc.) help
    - Only tricky code needs commenting
  - Do not comment just for the sake of it:
    - E.g. "x = 1 // 1 is assigned to x"
  - **Use Javadoc!!!**

Quiz: what's good/bad about this?

```
public class Book { // This class represents a Book
 private String x;
 private String y;

 public Book(String t, String a) {
  x = t;  // set title
  y = a;  // set author
 }
 public String getAuthor() { // Returns Book's Author
  return y;
 }
 public String getTitle() { // Returns the Book's Title
  return x;
}}
```

Layout

- Be consistent!
- Indentation (use some)
- Braces (either beginning or end of lines)
- Declare fields together (at beginning or end)
- Declare **public** methods together
- Likewise **protected/private** & same for fields
- Don't be a Jerk!

```
int ivl_bi11c1int0n[]; foo.bar
(   x<    ivl_billclint0n,
(0, true))};}} class nextclass { …
```

Two ways to use curly braces

```
int method(int x) {
 int y=3;
 return x+y;
}
```

```
int method(int x)
{
 int y=3;
 return x+y;
}
```

Dave says: I prefer the left version. Writing code is like gazing at the world through a porthole – you can never see everything you want at once. The version on the right is too verbose; it makes my "window to the world" even smaller than it needs to be.

Names

- Packages
  - `lowercase`
- Classes
  - `CapsWithWholeWordsCaps`
- Exception
  - `ClassNamesWithException`
- Interface (when necessary to distinguish from class)
  - `EndWithI` or `Ifc`
- Class (when necessary to distinguish from interface)
  - `EndWithImpl` or `EndWithObject`
- Constant (finals)
  - `UPPERCASE_UNDERSCORE`
- Avoid magic numbers — use constants instead

Names

- Fields
  - **`firstLowerThenCaps`** (or **`trailing_`** or **`thisVar`**)
- Local variables
  - **`firstLowerThenCaps`** (or **`lowecase_with_underscores`**)
- Methods
  - **`firstLowercaseThenCaps`**
- Getters/Setters
  - (**`T getX()`** or **`T x()`**), (**`setX(T v)`** or **`x(T v)`**)
- Factory/Creator Method
  - **`newT()`**
- Convertor Method
  - **`T toT()`**

Keep variables local!

- Always use smallest **scope** possible
- E.g. prefer A to B

A

```
class Date {
 int day;

 int nextDay() {
  int r = day + 1;
  return r;
}}
```

B

```
class Date {
 int day;
 int r;

 int nextDay() {
  r = day + 1;
  return r;
}}
```

Others

- Arrays:
  - "`Integer[] x`" (not "`Integer x[]`")
- Guard casts with conditionals
  - E.g. `if(x instanceof C) { C y = (C) x; … } else …`
- Separate *accessors* and *mutators*
  - Otherwise people are forced to mutate
  - E.g. `T pop()` => `void pop()` & `T top()`
- Avoid "=" inside if- and loop-conditions
  - E.g. `if((x=aMethod()) == 2) { … }`
- Prefer Object.equals() rather than "=="
  - Otherwise strange things can happen …

Example: wheres the bug?

```
class CLS_VeHicle { int WHEELZ =
  3; int how_manyweeehlz() {return
  (int) WHEELZ;}
void set_wheels(CLS_VeHicle _W){
  _W.WHEELZ = WHEELZ; }
void set_wheels(CLS_Motor_Car W_)
    { WHEELZ   =
  ((CLS_Vehicle)W_).WHEELZ;
       }}
```

Another Example

```
class Date {
 int day;   // day field
 int month; // month field
 int year;  // year field

 int nextDay() {   // next day method
  int r = day + 1; // r is day + 1
  return r;        // return r
}}
```

- What's wrong with this?

Yet Another Example

```
class Date {
 int day, month, year;

 public Date(int day, int month, int year) { … }

 /**
  * Return the day after this one.
  */
 Date nextDay() { return new Date(day+1,month,year); }


 /**
  * Return the day after this one.
  */
 Date prevDay() { return new Date(day-1,month,year); }
}
```

Still Anther Example

```
private Block parseTry(Tree stmt, FlowGraph cfg) {
  FlowGraph.Point exit = codePoint(null, stmt);
  Block body = parseStatement(stmt.getChild(0), null, cfg);
  Block rb = new Block(body);
  for (int i = 1; i < stmt.getChildCount(); ++i) {
    Tree child = stmt.getChild(i);
    if (child.getType() == CATCH) {
      Tree param = child.getChild(0);
      Type.Reference exceptionT = (Type.Reference) parseType(param
                                        .getChild(0));
      scopes.push(new Scope());
      String name = scopes.peek().id + param.getChild(1).getText();
      scopes.peek().variables.add(name);
      cfg.add(new FlowGraph.LocalVarDef(name, exceptionT, 0, false));
      …
```

- What does this code do ?

Tools can help ...

- Checkstyle
  - http://checkstyle.sourceforge.net/
- **Jalopy (source code beautifier)**
  - http://jalopy.sourceforge.net/
- **PMD**
  - http://pmd.sourceforge.net/
- **Jlint, FindBugs, etc.**
  - **Look for possible bugs in Java code**

SWEN221 Style

- See "**Good Programming Style**" page
  - http://ecs.victoria.ac.nz/Courses/SWEN221_2015T1/StyleGuide
- Read it and use it!
- You will be marked according to this style!