# **SystemScape** Coding Standards

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# **Introduction**

*All members present in this group must abide by the coding standards for all source codes in Java™ Programming Language as stated in this document.*

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### Reminder:

The recommendations are all in the following format:

**Recommendation**

i.e.,

|  |
| --- |
| Examples if available |

# 

# ***1 Naming Conventions***

### 1.1 General

**Package names should always be written in lowercase.**

i.e.,

|  |
| --- |
| designchallenge, view.calculator.event.single |

**Type names should always be nouns which are written in camel case beginning with an uppercase letter.**

i.e.,

|  |
| --- |
| Animon, AnimonTrainer |

**Naming variables should always be in camel case beginning with a lowercase letter.**

i.e.,

|  |
| --- |
| life, elementType |

**Constant names/ Final Variables should always be written in uppercase. Underscores must be used to separate words.**

i.e.,

|  |
| --- |
| GEN\_AVERAGE, THIRD\_ITERATION (Revised) |

**Method names must use verbs and should be written in camel case beginning with lower case.**

i.e.,

|  |
| --- |
| updateCalendar(), getTotalScore() (Revised) |

**Abbreviations and acronyms must not be written in uppercase when used as name.**

i.e.,

|  |
| --- |
| openHtmlFile(); *// NOT: openHTMLFile();*  collectVcdPlayer(); *// NOT: collectVCDPlayer();* |

**Generic variable names and type names must be the same.**

i.e.,

|  |
| --- |
| void catchAnimon(Animon animon) *// NOT: void catchAnimon(Animon monmon)*  *// NOT: void catchAnimon(Animon am)*  void setName(String string) *// NOT: void setName(String s)*  *// NOT: void setName(String temp)* |

**All names should be in English.**

**Scratch variables or temporary storage variables should have short names.**

i.e.,

|  |
| --- |
| int j = temp;  int j = 0; |

**Object name is implicit and must be not be used in a method name.**

i.e.,

|  |
| --- |
| animon.getType(); *// NOT: animon.getAnimonType();*  trainer.getName(); *// NOT: trainer.getTrainerName();* |

### 

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### 1.2 Specific

**Attributes can be accessed directly through the use of getters and setters**

i.e.,

|  |
| --- |
| movie.getTitle();  movie.setTitle(title); |

**Complement names must be used in naming methods/variables if one entity must co-exist with its opposite.**

i.e.,

|  |
| --- |
| *get/set, add/remove, create/destroy, start/stop, insert/delete, increment/decrement, old/new, begin/end, first/last, up/down, min/max, next/previous, old/new, open/close, show/hide, suspend/resume, etc.*  int max;  int min; *//Not: int smallest; vice-versa*  public void getFirst(){  }  public void getLast(){ *//Not public void getEnd(){*  *//*  } *// } vice-versa* |

**For boolean variables and methods, the prefix *is* must be used**

i.e.,

|  |
| --- |
| isBooked, isAlive, isIdle, isAvailable |

**The JFC (Java Swing) element type should be appended to it’s variable name.**

### i.e.,

|  |
| --- |
| openButton, calendarTable, rightScrollPane, nameTextField |

**Collection of objects represented by names must be in plural form**

i.e.,

|  |
| --- |
| ArrayList<Animon> animons;  int[] prices;  HashMap<String, String> cinemas; |

**Number of objects represented by variables must use the prefix *n***

i.e.,

|  |
| --- |
| nBookedSeats, nFollowers, nPackets |

**The *s*uffix “No” should be used for variables representing an entity number.**

i.e.,

|  |
| --- |
| seatNo, screeningNo, packetNo |

**Use i, j, k etc. for iterator variables.**

i.e.,

|  |
| --- |
| for (Iterator i = sales.iterator(); i.hasNext(); ) {  : }  for (int j = 0; j < nAnimons; j++) {  : } |

**Abbreviations should not be used in names.**

i.e.,

|  |
| --- |
| JLabel nameLabel; *//NOT: JLabel nameLbl;*  printScreen(); *//NOT: prtScr();* |

**Negated boolean variable names should not be used**

i.e.,

|  |
| --- |
| bool isAttending; *// NOT: isNotAttending* |

***Exception* should be appended to Exception class names.**

i.e.,

|  |
| --- |
| class CannotIntoException extends Exception { } |

**Factory classes can return its instances through the method named “*new[ClassName]”***

i.e.,

|  |
| --- |
| class BurgerFactory {  public Burger newBurger(...)  {  } } |

# ***2 Files***

**The case-sensitive name of the top-level class plus the .java extension is to be used as the filename of all source codes.**

i.e.,

|  |
| --- |
| class Pokemon  {  public Pokemon()  {  }  }  \*should be named as Pokemon.java |

**Classes should be stored in separate files wherein the filename matches the class name.**

**Special characters like TAB and page break must be avoided.**

**Follow the guidelines in splitting lines.**

i.e.,

|  |
| --- |
| totalPokemons = a + b + c +  d + e;  harvest(param1, param2,  param3);  String name = “First name” + “Middle name” +  "Last Name”); |
| Guidelines in splitting lines:   * Break after a comma. * Break after an operator. * Align the new line with the beginning of the expression on the previous line. |

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# ***3 Statements***

### 3.1 Package and Import Statements

**The file’s first statement should be the package statement; every file must be included in a specific package.**

**Explicitly list *all* imported classes.**

i.e.,

|  |
| --- |
| import javax.swing.JRadioButton;  import java.util.ArrayList; |

### 

### 3.2 Types

**Array specifiers must be right next to the type not the variable.**

i.e.,

|  |
| --- |
| int[] integers = new int[5]; *// NOT: int integers[] = new int[5];* |

**3.3 variables**

**Local variables should be initialized where they are declared, while class variables are to be initialized in the class’s constructor.**

**All variables should have only *one* meaning.**

**Declare all class variables as *private*.**

**3.4 loops**

**Initialize iterators outside of the for loop**

i.e.,

|  |
| --- |
| int i; *// NOT: for (int i= 0, sum = 0; i < 100; i++)* for (i = 0; i < 100; i++)  *sum += addend[i];*  sum += addend[i]; |

***Circumvent* the use of *do-while loops* unless absolutely necessary.**

**The use of *break* and *continue* in loops is prohibited.**

**3.5 conditionals**

**The conditional should always be put on a different line.**

i.e.,

|  |
| --- |
| if (isAlive) *// NOT: if (isAlive) catchAnimon();*  catchAnimon(); |

**Refrain from using executable statements in conditionals.**

i.e., (Example is subject to change)

|  |
| --- |
| InputStream stream = File.open(fileName, "w"); if (stream != null) {  : }  *// NOT: if (File.open(fileName, "w") != null)) {  : }* |

**3.6 Miscellaneous**

**Refrain from using arbitrary numbers; constants can be declared for use of numbers other than 0 and 1.**

i.e., (Example is subject to change)

|  |
| --- |
| private static final int TEAM\_SIZE = 11; : Player[] players = new Player[TEAM\_SIZE]; *// NOT: Player[] players = new Player[11];* |

**The representation of floating point constants should always be with at least one decimal and with a decimal point.**

i.e., (Example is subject to change)

|  |
| --- |
| double total = 0.0; *// NOT: double total = 0;* double speed = 3.0e8; *// NOT: double speed = 3e8;*  double sum; : sum = (a + b) \* 10.0; |

**A digit must always be placed before the decimal point for floating point constants.**

i.e., (Example is subject to change)

|  |
| --- |
| float total = 0.13; *// NOT: float total = .13;* |

***4 LAYOUTS AND COMMENTS***

**4.1 Layouts**

**Basic indentation should be *4 spaces*.**

i.e.,

|  |
| --- |
| for (i = 0; i < nElements; i++)  a[i] = 0; |

**Block layout should be as illustrated in example 1.**

i.e.,

|  |  |  |
| --- | --- | --- |
| while (!done) {  doSomething();  done = moreToDo(); } | while (!done) {  doSomething();  done = moreToDo(); } | *while (!done)  {  doSomething();  done = moreToDo();  }* |

**If-else statements should be in the following form:**

i.e.,

|  |
| --- |
| if (condition) {  statements; }  if (condition) {  statements; } else {  statements; }  if (condition) {  statements; } else if (condition) {  statements; } else {  statements; }  *//Can be written without braces if there’s only one statement* |

**For, while and do-while statements should be in the following form:**

i.e.,

|  |
| --- |
| for (initialization; condition; update) { *//Can be written without braces if there’s only one*   statements; *//statement* }  while (condition) { *//Can be written without braces if there’s only one*  statements; *//statement* }  do {  statements; } while (condition); |

**Switch statements should have the following form:**

i.e.,

|  |
| --- |
| switch (condition) {  case ABC : statements;  ....  statements;  case DEF : statements;  break;   case XYZ : statements;  ....  statements;  break;   default : statements;  break; } |

**Try-catch statements should have the following form:**

i.e.,

|  |
| --- |
| try {  statements; } catch (Exception exception) {  statements; }  try {  statements; } catch (Exception exception) {  statements; } finally {  statements; } |

**4.2 spacing**

### Space characters should exist:

### - Before and after operators.

### - Before and after colons.

### - After commas.

### - After semicolons in for statements.

i.e.,

|  |
| --- |
| a = (b + c) \* d; *// NOT: a=(b+c)\*d*  doSomething(a, b, c, d); *// NOT: doSomething(a,b,c,d);*  case 100 : *// NOT: case 100:*  for (i = 0; i < 10; i++) { *// NOT: for(i=0;i<10;i++){  ...* |

**Methods should be separated by 2 blank lines.**

i.e.,

|  |
| --- |
| public getMax(){  }  public getMin(){  } |

**4.3 comments**

**There should be a space after the comment identifier.**

i.e.,

|  |
| --- |
| // This is a comment *NOT: //This is a comment*  /\*\* *NOT: /\*\**  \* This is a javadoc  *\*This is a javadoc*  \* comment  *\*comment*  \*/  *\*/* |

**All comments should be written in English.**

**Logical units in a block should be separated by one blank line.**

i.e.,

|  |
| --- |
| *// Initializing components*  JPanel buttonsPanel = new JPanel();  JButton loadButton = new JButton(“Load”);  JButton saveButton = new JButton(“Save”);  *// Location setting* loadButton.setBounds(5, 5, 50, 20);  saveButton.setBounds(5, 25, 50, 20);  *// Component registration* buttonsPanel.add(loadButton);  buttonsPanel.add(saveButton); |

**Use // for comments, including multi-line comments.**

i.e.,

|  |
| --- |
| // A comment  // continuation of the comment |