Code Smell Cheat Sheet

SYMPTOMS	CODE SMELL	NOTES
• Duplicated codes • Same code structure or expression in more than one place	**Duplicated Code**	
• A long method	**Long Method**	- Long methods are bad because long procedures are hard to understand. - Name a small method after the intention of the code, not implementation details. Small methods should have good names that reveal the intention of the code. - "The key here is not method length but the semantic distance between what the method does and how it does it."
• A large class • A class that's trying to do too much • A class with too many instance variables	**Large Class**	
• A long parameter list	**Long Parameter List**	- Long parameter lists are bad because they are hard to understand and use and can easily become inconsistent.
• A class is commonly changed in different ways for different reasons • A class suffers many kinds of changes.	**Divergent Code**	What we want are: - "When we make a change we want to be able to jump to a single clear point in the system and make the change." - Each object is changed only as a result of one kind of change. - Ideally, have a one-to-one link between common changes and classes.

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• A change requires alerting many classes • When you want to make a kind of change, you need to make a lot of little changes to a lot of different classes.	**Shotgun Surgery**	"When the changes are all over the place, they are hard to find, and it's easy to miss an important change."
• A method seems more interested in another class than the one it actually is in. • A method does not leverage data or methods from the class it belongs to. Instead, it requires lots of data or methods from a different class.	**Feature Envy**	
• Three or four data items clump together in lots of places such as fields in a couple of classes or parameters in many method signatures.	**Data Clumps**	- "Bunches of data that hang around together really ought to be made into their own object."
• Using multiple primitive data types to represent a concept such as using three integers to represent a date	**Primitive Obsession**	- Don't be afraid to use small objects for small tasks such as money classes that combine number and currency
• A switch statement that is duplicated in multiple, different places. If you add a new clause to the switch, you have to painstakingly find each scattered switch statement and change it.	**Switch Statements**	- "One of the most obvious symptoms of object-oriented code is its comparative lack of switch (or case) statements." - Consider polymorphism when you see a switch statement.

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• Parallel inheritance hierarchies • Every time you make a subclass of one class, you also have to make a subclass of another. • Prefixes of the class names in one hierarchy are the same as the prefixes in another hierarchy.	**Parallel Inheritance Hierarchies**	- "Parallel inheritance hierarchies is really a special case of shotgun surgery."
• A class that isn't doing enough to pay for itself.	**Lazy Class**	- "Each class you create costs money to maintain and understand."
• The only users of a method or class are test cases.	**Speculative Generality**	- This happens when people thought they need a method or class for a future requirement but it turned out they didn't really need it.
• An instance variable is set only in certain circumstances.	**Temporary Field**	- "Such code is difficult to understand, because you expect an object to need all of its variables. Trying to understand why a variable is there when it doesn't seem to be used can drive you nuts."
• A method calling a different method which calls a different method which calls a different method ...	**Message Chains**	- A message chain couples a client of the method to the structure of the navigation. Any change to the intermediate relationships requires the client to have to change.

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• A class with lots of methods delegated to this other class	**Middle Man**	
• Classes delving in each others' private parts too much	**Inappropriate Intimacy**	
• Methods that do the same thing but have different signatures for what they do	**Alternative Classes with Different Interfaces**	
• Trying to modify a library class to do something you'd like it to do	**Incomplete Library Class**	
• Classes have nothing but fields and getters and setters for these fields. • Classes act as dumb data holders and are manipulated in far too much detail by other classes.	**Data Class**	- "Data classes are like children. They are okay as a starting point, but to participate as a grownup object, they need to take some responsibility."

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• A subclass only uses a few methods or data given by the superclass (Unless it's causing confusion and problems, this smell is too faint to be worth cleaning.) • A subclass does not want to support the interface of the superclass.	**Refused Bequest**	
• Using comments to explain what a block of code does	**Comments**	- Use comments to indicate areas you are not sure and to say why you did something. - "When you feel the need to write a comment, first try to refactor the code so that any comment becomes superfluous."