

Identify at least eight code smells in code written by one of the two people performing the code review.

Point to the relevant code and commits from your report when explaining the refactorings.

#	Code Smell	Relevant Code & Commit	Explanation
1	Long Method	In Game class Tick commit number: ea496f17684f7e9fb0 0fd004f32c6a737718 100b	The tick method had many for loops that went through each entity type, checked for collision and then did the relevant action, like gaining or taking away points. This behavior was split into many private methods that handle collision for each entity type.
2	Duplicated Code	initializeLabels() function in Game.java  commit number: ddd2edc4e4646ade0 ac709daf5462717a4 330da3	To initialize the labels for the game, the same code was copy and pasted three times. By the rule of three, I have refactored this code into a customizable function that takes the attributes as parameters and initializes a label accordingly.
3	Large Class / Blob	Split Game.java into GameUI.java  Game.java GameUI.java  commit number: ccad78259293a43a4 52f3a0a3818a5c99b 122834  commit number: 2d25d4555ab6df72d ab94d578ba21f7823 923244	Split the UI from the Game Logic. I made a new class (GameUI.java) that handles all of the UI elements in a game. Prior to this the Game logic contained all of the logic and all of the UI element rendering and updating. I have split it to reduce the size of the class and differentiate the functions of the classes.
4	Data Clumps/Primitive Obsession	GameData.java  commit number: 515cfa4a5795da1c5	All of the arrays that held the game data were kept as separate arrays. I created an object called GameData.java that rolled all of

		8ea268d364a2c87fd2e99cd	these arrays into one and added additional functionality for simplicity (add/clear function)
5	Duplicated Code	<p>TileMap.java There were two instances of the same test level.</p> <p>Commit number: fc15e54dc9a77a59e a0fdb4784900085a2 479958</p>	There were two instances of the same test level. Caused bugs
6	unnecessary use of unsafe or unsound constructs	<p>In Game class. Data methods of Game object were all public Commit number: 4289b63156038d90d 5a8c0f6d999b610d0 4dc87a</p>	Class was not properly constructed. Most of the data members were left public. This is unsafe because any outside method can manipulate them without proper protection. This was changed so that they were all private, increasing data hiding property.
7	Dead Code	<p>In Game class. Minscore attribute is now removed. Commit number:13cb0526df869d1d0d97d0a44b1dd9d4a5a02afa In TileMap class. References to minscore are removed Commit number:5cb71c4cf2e2b51568db090811ddb96ad88558c5</p>	The minscore way of checking whether a player can progress to the next level had been replaced with whether all rewards on the current level had been collected. The minscore data was still hanging around in a few places without purpose.
8	unnecessary for/if/else or switch/case statements	<p>In Game class Commit number:39d73c7ee8afdd1431dba3a3a9d75fc70307389e</p>	The collision detection looped through an arraylist for players as if there was going to be more than 1. There is only 1 however so this is unnecessary.