Better Code Hub

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up201406036/WorldEdit

Last analysis: 6 minutes ago

Write Short Units of Code

Guideline

- Small units are easier to understand, reuse, and test.
- When writing new units, don't let them grow above 15 lines of code.
- When a unit grows beyond 15 lines of code, you need to shorten it by splitting it in smaller units of no longer than 15 lines of code.
- The list on the right side contains the top 30 of units that violate this guideline, sorted by severity. The severity is indicated by the colors of the checkboxes.
- Further reading: Chapter 2 of Building Maintainable Software

Refactoring candidates

✓ Unit

- $block17
- $block2
- draw.js:DefaultUnit
- MobSpawnerBlock.setNbtData(CompoundTag)
- CuboidClipboard.flip(FlipDirection,boolean)
- UtilityCommands.help(CommandContext,WorldEdit,Acto...
- PermissionsResolverManager.loadConfig(File)
- SnapshotUtilCommands.restore(Player,LocalSession,E...
- ParametricCallable.$constructor(ParametricBuilder,...

at most 15 lines of code
more than 15 lines of code
more than 30 lines of code
more than 60 lines of code

Write Simple Units of Code

Guideline

- Keeping the number of branch points (if, for, while, etc.) low makes units easier to modify and test.

Refactoring candidates

✓ Unit

- BlockData.flip(int,int,FlipDirection)

- Try to limit the McCabe complexity, that is number of branch points minus 1, in a unit to at most 5.
- You can reduce complexity by extracting sub-branches to separate units of no more than 4 branch points.
- The list on the right side contains the top 30 of units that violate this guideline, sorted by severity. The severity is indicated by the colors of the checkboxes.
- Further reading: Chapter 3 of Building Maintainable Software

- [ ] maze.js:DefaultUnit
- [ ] DefaultBlockParser.parseLogic(String,ParserContext)
- [ ] BlockData.rotate90(int,int)
- [ ] BlockData.rotate90Reverse(int,int)
- [ ] Parser.parseStatements(boolean)
- [ ] BlockType.getBlockDrop(int,short)
- [ ] BlockData.cycle(int,int,int)
- [ ] SchematicReader.read(WorldData)

- [ ] McCabe of at most 5
- [ ] McCabe above 10
- [ ] McCabe above 5
- [ ] McCabe above 25

Write Code Once

Guideline

- When code is copied, bugs need to be fixed in multiple places. This is both inefficient and error-prone.
- Avoid duplication by never copy/pasting blocks of code.
- Reduce duplication by extracting shared code, either to a new unit or to a superclass.
- The list on the right side contains the top 30 sets of modules (grouped by highlighting) which contain the same duplicated code block.
- Further reading: Chapter 4 of Building Maintainable Software

Refactoring candidates

✓ Module

- [ ] BlockType.java
- [ ] ItemType.java
- [ ] NBTConverter.java
- [ ] NBTConverter.java
- [ ] BlockBag.java
- [ ] BlockBag.java
- [ ] BukkitCommandSender.java
- [ ] SpongeCommandSender.java
- [ ] TrueZipLegacyChunkStore.java

- [ ] non-duplicated code
- [ ] duplicated code

Keep Unit Interfaces Small

Guideline

- Keeping the number of parameters low makes units easier to understand and reuse.

Refactoring candidates

✓ Unit

- [ ] GenerationCommands.generateBiome(Player,LocalSessi...

- Limit the number of parameters per unit to at most 4.
- The number of parameters can be reduced by grouping related parameters into objects.
- The list on the right side contains the top 30 of units that violate this guideline, sorted by severity. The severity is indicated by the colors of the checkboxes.
- Further reading: Chapter 5 of Building Maintainable Software

- GenerationCommands.generate(Player,LocalSession,Ed...
- GenerationCommands.sphere(Player,LocalSession,Edit...
- EditSession.drawSpline(Pattern,List,double,double,...
- RegionCommands.deform(Player,LocalSession,EditSess...
- RecursivePickaxe.recurse(Platform,EditSession,Worl...
- FloodFillTool.recurse(Platform,EditSession,World,B...
- GenerationCommands.cyl(Player,LocalSession,EditSes...
- Functions.findClosest(Map,double,double,double,int

- at most 2 parameters
- more than 4 parameters
- more than 2 parameters
- more than 6 parameters

Separate Concerns in Modules

Guideline

- Keep the codebase loosely coupled, as it makes it easier to minimize the consequences of changes.
- Identify and extract responsibilities of large modules to separate modules and hide implementation details behind interfaces.
- Strive to get modules to have no more than 10 incoming calls.
- The list on the right side contains the top 30 of modules that violate this guideline, sorted by severity. The severity is indicated by the colors of the checkboxes.
- Further reading: Chapter 6 of Building Maintainable Software

Refactoring candidates

✓ Module

- BlockType.java
- EditSession.java
- WorldEdit.java
- LocalSession.java
- YAMLNode.java
- Vector.java
- CommandContext.java
- Vector2D.java
- CompoundTag.java

- at most 10 incoming calls
- more than 20 incoming calls
- more than 10 incoming calls
- more than 50 incoming calls

Couple Architecture Components Loosely

Guideline

- Having loose coupling between top-level components makes it easier to maintain

Refactoring candidates

✓ Module

components in isolation.

- Do this by minimising the amount of interface code; that is, code in modules that are both called from and call modules of other components (throughput), and code in modules that are called from modules of other components (incoming).
- You can hide a component's implementation details through various means, e.g. using the "abstract factory" design pattern.
- The list on the right side contains the top 30 of modules that violate this guideline, starting with the modules that contain throughput code.

  - Further reading: Chapter 7 of Building Maintainable Software

Keep Architecture Components Balanced ✓

Guideline

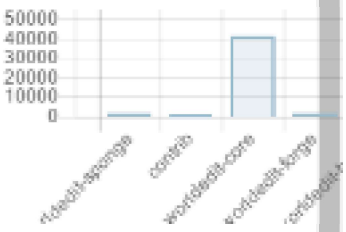
- Balancing the number and relative size of components makes it easier to locate code.
- Organize source code in a way that the number of components is between 2 and 12, and ensure the components are of approximately equal size (keep component size uniformity less than 0.71).
- Organising components based on functionality makes it easier to divide your code into components.

  - Further reading: Chapter 8 of Building Maintainable Software

Components overview

0.68
Component size uniformity

5
Components



Keep Your Codebase Small ✓

Guideline

- Keeping your codebase small improves maintainability, as it's less work to make structural changes in a smaller codebase.

Volume overview

- Avoid codebase growth by actively reducing system size.
- Refactor existing code to achieve the same functionality using less volume, and prefer libraries and frameworks over "homegrown" implementations of standard functionality.
- Strive to keep volume below 20 Man-years.

Further reading: Chapter 9 of Building Maintainable Software

67
Man-months

Automate Tests

Guideline

- Automating tests for your codebase makes development more predictable and less risky.
- Add tests for existing code every time you change it.
- For small systems (less than 1,000 lines of code), you should have at least some test code and one assertion (currently only checked for Java and C# systems).
- For medium systems (less than 10,000 lines of code), the total lines of test code should be at least 50% of the total lines of production code, and the assert density (percentage of lines of test code containing assertions) should be at least 1% (currently only checked for Java and C# systems).
- For large systems (more than 10,000 lines of code), the total lines of test code should be at least 50% of the total lines of production code, and the assert density should be at least 5% (currently only checked for Java and C# systems).

Further reading: Chapter 10 of Building Maintainable Software

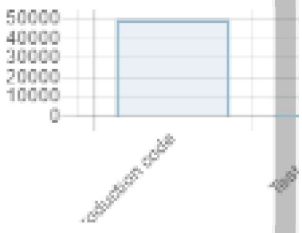
Testing overview

49,212
Lines of production code

2%
Test code percentage

842
Lines of test code

17%
Assert density



Write Clean Code

Guideline

- Clean code is more maintainable.
- Proactively search and remove code smells.
- Remove useless comments, commented code blocks, and dead code. Refactor poorly handled exceptions, magic constants, and poorly names units or variables.
- The list on the right side contains a selection of violations for this guideline.
- Further reading: Chapter 11 of Building Maintainable Software

Refactoring candidates

✓ Module

- maze.js
- DynamicPluginCommand.java
- DynamicPluginCommandHelpTopic.java
- DynamicPluginCommandHelpTopic.java
- FlatFilePermissionsResolver.java
- FlatFilePermissionsResolver.java
- PermissionsResolverManager.java
- PermissionsResolverManager.java
- BukkitWorld.java

clean code code smell