SonarScore plugin for SonarQube™  
Points Metric Calculation Formula

# Overview

The formula for calculating points depends on variables that will be specifiable by the administrator of the SonarQube™ Server in the near future. When not specified (as they aren’t now since specifying hasn’t been implemented), default values will be used.

The formula for calculating points is three-staged:

1. Base Points are calculated from selected metrics and values(through a piecewise linear function) or from a given number.
2. Aggregated Points are calculated from the Base Points by multiplying the base with selected “100% metrics” – metrics that ideally should be at 100%.
3. Final Points are calculated from the Aggregated Points by adding bonuses and penalties, which are calculated from selected metric values (multiplied by a selected factor).

In other words:

Final Points = Base Points \* (Product of selected “100% metrics”) + (Sum of bonuses and penalties)

# Base Points

## Default

The default calculation of Base Points is based off of packages, classes, and non-comment lines of code.

It works like this:

* Packages:
  + The first 3 count each as 1
  + The next 12 count each as 0.5
  + The next 30 count each as 0.1
* Classes per adjusted number of packages (as counted above):
  + The first 3 count each as 1
  + The next 2 count each as .5
  + The next 10 count each as .2
* Lines per adjusted number of classes (as counted above):
  + The first 30 count each as 3
  + The next 30 count each as 2
  + The next 30 count each as 1
* The Base Points are equal to the result of Lines per number of Classes.

So, with the default calculation, the bigger a project gets, the less it can accumulate points by growing in size; in fact, once a project has 45 packages, 675 (15\*45) classes, and 60,750 (675\*90) lines of code, it can no longer gain points by growing, and long before that the number of points it would gain became rather small.  
Another example: A project having 10 packages, 50 classes, and 9,000 lines of code would have points equal to:

(adjusted number of packages)\*(adjusted number of classes)\*(adjusted number of lines) =

(6.5\*5\*180) =

5,850 points

It is worthwhile to note that a project with the same number of packages and classes but with only 2,725 lines would also have 5,850 points.

## Customizable Variable Specification (Planned)

The variables for calculating base points will be specifiable by the admin, such that:

* Any combination of metrics and adjustment numbers can be used (for example, methods per class)
* Numbers without metrics can be used (for example, starting with 1,000 base points right off)
* Metrics won’t have to be used at all if they are not desired (perhaps a company wants all their projects to have points from 10,000 irrespective of size).

# Aggregated Points

## Default

The Base Points are multiplied by:

* Percent Rules Compliance / 100
* Percent Test Coverage / 100
* Percent Documented API / 100

## Customizable Variable Specification (Planned)

Any combination of “100% Metrics” can be specified. For example, a company might not be as worried about documentation, or perhaps also wants to consider Branch Coverage.

# Final Points

## Default

Package Tangle Index is multiplied by 100, and the product is subtracted from the Aggregated Points:

Final Points = Aggregated Points – (Package Tangle Index \* 100).

This of course means you want to keep Package Tangle at 0%.

## Customizable Variable Specification (Planned)

Any number of Metrics can be specified, along with a factor, as a bonus or a penalty, and these will be accordingly added to or subtracted from the Aggregated Points to return the Final Points.

# Summary

The default point calculation derives a base point number from the packages, classes, and lines, after which the following formula is applied:

Final Points = Base Points\*( (Rules Compliance/100)\*(Test Coverage/100) \* (Documented API/100) ) — (100\*Package Tangle Index)

This formula can be abstracted out and admin-specified variables used:

Final Points = Base Points \* (Product of selected “100% metrics”) + (Sum of bonuses and penalties)