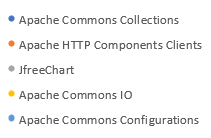
**Correlation between Maintainability Index and Post release defect density**

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
| **Project Name** | **Versions** | **No of Post Release Defects** | **SLOC** | **Post-Release Defect Density** | **Maintainability Index** | **Spearman Correlation Coefficient** |
| **Apache**  **Commons Collections** | 1 | 1 | 27083 | 0.000036923 | 63.82 | 0.143 |
| 2 | 4 | 13563 | 0.00029492 | 59.40 |
| 3 | 15 | 45670 | 0.000328443 | 69.03 |
| 4 | 36 | 51608 | 0.000697566 | 66.52 |
| 4.1 | 13 | 60717 | 0.000214108 | 65.01 |
| 4.2 | 3 | 62645 | 0.00004789 | 76.30 |
| **Apache HTTP Components Clients** | 4.4.1 | 1 | 74293 | 1.34602E-05 | 71.42 | -0.46 |
| 4.5.2 | 2 | 75021 | 2.66592E-05 | 68.91 |
| 4.5.3 | 2 | 75427 | 2.65157E-05 | 69.12 |
| 4.5.5 | 1 | 76095 | 1.31415E-05 | 69.27 |
| 4.5.6 | 1 | 76130 | 1.31354E-05 | 69.26 |
| 4.5.7 | 2 | 76128 | 2.62715E-05 | 79.10 |
| **JfreeChart** | 1.0.12 | 9 | 144406 | 6.23243E-05 | 52.29 | -0.49 |
| 1.0.13 | 7 | 145897 | 4.79791E-05 | 55.23 |
| 1.0.14 | 23 | 145030 | 0.000158588 | 56.86 |
| 1.0.15 | 13 | 144690 | 8.98473E-05 | 72.24 |
| 1.0.16 | 1 | 144192 | 6.9352E-06 | 75.52 |
| 1.0.17 | 3 | 144340 | 2.07843E-05 | 81.29 |
| **Apache Commons IO** | 2 | 8 | 21434 | 0.000373239 | 67.61 | 0.26 |
| 2.1 | 12 | 22129 | 0.000542275 | 67.07 |
| 2.2 | 6 | 23789 | 0.000252217 | 66.28 |
| 2.3 | 10 | 23983 | 0.000416962 | 66.50 |
| 2.4 | 64 | 24384 | 0.002624672 | 66.30 |
| 2.5 | 24 | 29152 | 0.000823271 | 74.94 |
| **Apache Commons Configurations** | 1.1 | 39 | 15181 | 0.002569001 | 54.97 | -0.60 |
| 1.2 | 12 | 18489 | 0.000649035 | 53.34 |
| 1.3 | 19 | 27819 | 0.000682986 | 56.04 |
| 2.1 | 12 | 65558 | 0.000183044 | 68.35 |
| 2.2 | 8 | 66697 | 0.000119945 | 65.09 |
| 2.3 | 6 | 67096 | 0.00008942 | 64.15 |

This table describes the values obtained for post release bugs and Maintainability Index of each version of the project. We have calculated the spearman correlation coefficient using an online tool combining all the versions of a project. The correlation not so good for some projects because having a better/higher maintainability index ensures less software maintenance costs. However, it might not always ensure a bug free system.



The scatterplot drawn using Excel depicts the correlation between the two metrics where we have found 2 outliers. This might be because the maintainability index depends on other factors like Halstead volume, SLOC and cyclomatic complexity which changes with operators and operands. This increase does not mean there should be increase in cyclomatic or the other way around.