

Assignment 2

Task 9

Author Details

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Answer

In the redacted version of the BAT, the number of bugs I have found in total is 7, 3 of which were written in the bug reports for Task 6. Here is a summary of the bugs found:

1. Search by patron's name is case sensitive.
2. The “._on_loan” attribute never decrements.
3. The “outstanding_fees” attribute can be negative.
4. The loan length for borrowed books is incorrect.
5. An infinite loop occurs when a patron without loans tries to return an item.
6. A patron that is 18 years old with the required training completed and has no outstanding fee is not allowed to borrow carpentry tools.
7. A patron that is 50 years old is given a 10% discount.

From this redacted version of the BAT, I estimate that there are approximately 1200 lines of code (LOC).

Following the tutorial in Week 10 on defect density, we can find the number of bugs per 1200 lines of code.

This is the formula used to calculate defect density:

$$\text{defect density} = \frac{\text{number of bugs}}{\text{number of } X}$$

where X can be lines of code, 1000 lines of code, modules, methods

Here, let X be converted to “per 1000 lines of code”.

$$\text{So, } X = 1200 / 1000 = 1.2$$

Therefore, the defect density is $7 / 1.2 \approx 5.8$

Now, we can use this defect density value obtained to estimate the number of bugs in the real version of BAT.

Firstly, the 9842 LOC of the real version of BAT needs to be converted to “per 1000 lines of code”, which is 9.842.

Thus, the estimated number of bugs is:

$$\begin{aligned}\text{Estimated number of bugs} &= X * \text{defect density} \\ &= 9.842 * 5.8 \\ &\approx 57.4 \text{ (1 d.p.)}\end{aligned}$$