Defect Analyses

Team 7

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October 24, 2021

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1 40% rule

1.1 What do you predict as the total number of bugs in the system?

The first step is to get what is the month with the defects, in our case is going to be the third month which has 24 defects (t_3=24).

The next step is to calculate the sum of the defects up to that day so we get the sum from the defects from month 1 to month 3.

$$Sum = Defects1 + Defects2 + Defects3$$

$$Sum = 13 + 20 + 24$$

$$Sum = 57$$

The total of defects found up to the third month is **57**. With that value we are going to calculate what is the expected defects to be found using the formula.

$$Defects = Sum * 100/40$$

$$Defects = 57 * 100/40$$

$$Defects = 143$$

The total of defects that are found in the system is **143**.

1.2 How many bugs do you predict as being left in the system?

Now we have a total of defects that are found in the system, the next step is to get the Sum of all the defects.

$$Sum = Defects1 + Defects2 + Defects3 + Defects4 + Defects5 + Defects6$$

$$Sum = 13 + 20 + 24 + 22 + 17 + 8$$

$$Sum = 104$$

So far we have only found **104** defects, which means we need to subtract this from the **143** expected defects.

$$DefectsLeft = 143 - 104$$

$$DefectsLeft = 39$$

This will give us a total of **39** defects left to be found.

1.3 What is the equation that predicts the defects?

$$f(t)/K = 1 - e^{(-1/2)} = 0.4$$

1.4 If you shipped at the end of month 6 (and assuming you removed all the defects found at that time), what would you predict as the defect removal efficiency?

Since we know that the total of defects is going to be **143** and for that release we had fixed **104** that means that we still could see **39** new defects after the 6-month release so the DRE (Defect Removal Efficiency) would be **72.72%**.

$$DRE = E/(E + D)$$

$$DRE = 104/(104 + 39)$$

$$DRE = 104/143$$

$$DRE = 0.7272 = 72.72\%$$

2 t_m and one more data point

2.1 What do you predict as the total number of bugs in the system?

We are going to use t_3 as a reference because it's the month with most defects, the first step is to calculate the **C**.

$$c = t_m * \sqrt[2]{2}$$

$$C = c^2 = (t_m * \sqrt[2]{2})^2$$

$$C = t_m^2 * 2$$

$$C = 3^2 * 2$$

$$C = 9 * 2$$

$$C = 18$$

Now that we have **C** we are going to use the first month to solve **K**.

$$t = 1; f(1) = 13;$$

$$T = t^2 = 1$$

$$K = C * e^{(T/C)} * f(t)/2t$$

$$K = 18 * e^{(1/18)} * 13/2(1)$$

$$K = 124$$

The total number of bugs for the system is going to be **124**.

2.2 How many bugs do you predict as being left in the system?

We already calculate the total of bugs in the system which is **124** and so far we had found **104** bugs which give us a total of **20** bugs left in the system.

$$Defects = 124 - 104$$

$$Defects = 20$$

2.3 What is the equation that predicts the defects?

Given that the $\mathbf{K} = 124$ and $\mathbf{C} = 18$ the equation would be.

$$f(t) = K * (2t/c^2) * e^{-(t/c)^2}$$

$$T = t^2; C = c^2;$$
$$f(t) = K * (2t/C) * e^{-(T/C)}$$
$$f(t) = 124 * (2t/18) * e^{-(T/18)}$$
$$f(t) = 124 * (t/9) * e^{-(T/18)}$$

2.4 If you shipped at the end of month 6 (and assuming you removed all the defects found at that time), what would you predict as the defect removal efficiency?

Since we know that the total of defects is going to be **124** and for that release we had fixed **104** that means that we still could see **20** new defects after the 6-month release so the DRE (Defect Removal Efficiency) would be **83.87%**.

$$DRE = E/(E + D)$$

$$DRE = 104/(104 + 20)$$
$$DRE = 104/124$$
$$DRE = 0.8387 = 83.87\%$$