

The University of W.A.

The Software Process - CITS 5502

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Assignment Two – Simulating a Process

This assignment is worth 20% of the final mark for this unit. The report is due on Monday the 9th September (office closes at 4.30pm) with graphs and a discussion covering the results and conclusions. Extra marks are available for early submission.

The attached sheet contains data adapted from an actual test process. The process had two stages {finding defects; fixing defects}. The table represents the rate of finding defects by one competent tester working 25 hours per week over a twenty-week period and 300 defects were discovered in that time. They were classified as having a major impact on the usability of the system or only a minor effect – and as hard or easy to fix. The hard ones will take five hours to fix and the easy can be done in two hours (on average). You are the project manager with three experienced software engineers (each working 25 hours per week) available for testing the system and fixing the defects. The users have stated that the major defects are “seven times as damaging” on average as the minor ones.

Clearly state your objectives and any assumptions you have to make in the simulations. Discuss the measurement process and the data. What other data might have been collected? Fit defect detection curves to the data. Do they fit well? How many defects do you estimate are still in the system after the 300 defects have been found? Choose at least three appropriate metrics for measuring the test and repair process. Some possible metrics for illustrating progress each week (in each case the smaller the value, the better) are:

- [1] Estimate of number of unfixed defects (found & unfound) still in the software
- [2] Total importance of found defects still to be fixed ($= 7 \times \text{\#major} + 1 \times \text{\#minor}$)
- [3] Average time in queue of major defects still to be fixed
- [4] Ratio of defects fixed to defects found

One allocation of your staff might be to have one person testing and the other two fixing the defects. However, you cannot fix all the defects at once. Repair strategies might be:

- Solve them in a random order
- Solve the easy ones first
- Solve the hard ones first
- Solve the major ones first
- Solve the minor ones first
- Solve them in the order in which they are found (FIFO)

Produce a table (or graphs – Excel is acceptable) of your metrics each week for each of the six strategies. Relate your results to system reliability and also customer satisfaction.

Consider the use of your resources. How could the performance of your team be improved if the tester was shifted to repair activities for a few weeks? – or if one of the repair engineers was given the task of testing for a few weeks? If you wished to minimise the time major defects went unfound and unfixed, what would your optimum allocation of staff be?

Data for CITS 5502, Assignment Two, August 2013

Category:	Hard & Major	Hard & Minor	Easy & Major	Easy & Minor	Total
User impact	7	1	7	1	
Hours to fix	5	5	2	2	
Week					
1	10	6	7	25	48
2	7	9	8	20	44
3	6	5	4	15	30
4	7	4	8	8	27
5	2	5	1	14	22
6	3	3	2	16	24
7	1	2	1	15	19
8	1	1	3	9	14
9	1	4	1	7	13
10	2	2	2	5	11
11	1	1	1	5	8
12	1	0	4	3	8
13	2	1	3	2	8
14	2	1	3	2	8
15	1	1	0	1	3
16	0	0	1	1	2
17	2	2	0	0	4
18	0	1	0	1	2
19	1	2	0	1	4
20	0	0	1	0	1
Total	50	50	50	150	300
Total hours	250	250	100	300	900