Chapter 13
Exercises

This chapter shows several exercises for understanding the reliability assessment measures for OSS reliability measurement and assessment, e.g., MTBF, predicted relative error, and remaining faults. The following problems will be useful for software managers to evaluate OSS quality/reliability.

13.1 Exercise 1

Figure 13.1 shows the estimated MTBF in Eq. (10.4) based on the hazard rate model. Discuss the reliability trend of OSS in Fig. 13.1.

Brief Solution

It is important for software managers to understand the trends of reliability growth or regression. Figure 13.1 tends to show the trend of reliability growth because the estimated MTBF becomes large with the operating procedures go on.

13.2 Exercise 2

Figure 13.2 shows the estimated predicted relative error in Eq. (8.17). Discuss the goodness of fit of the estimated each model in Fig. 13.2.

Brief Solution

As shown in Fig. 12.13, the variation of all modeling estimations becomes stable when the debugging progress ratio exceeds 50 %.

13.3 Exercise 3

Figure 13.3 shows the estimated sample path of stochastic differential equation model in Eq. (9.19). Discuss the stability of the estimated sample paths in Fig. 13.3.

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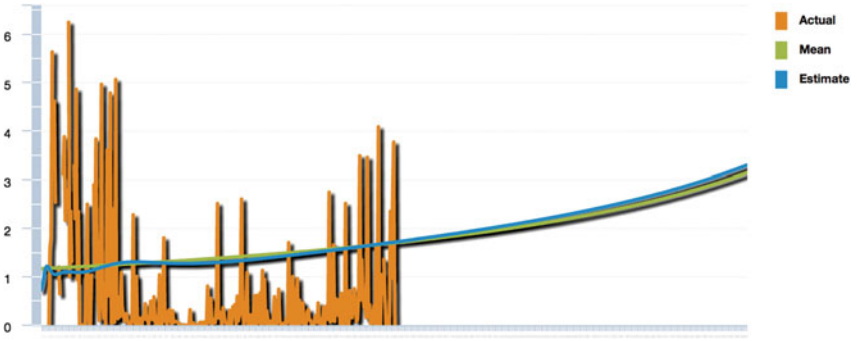

Fig. 13.1 The estimated MTBF based on the hazard rate model

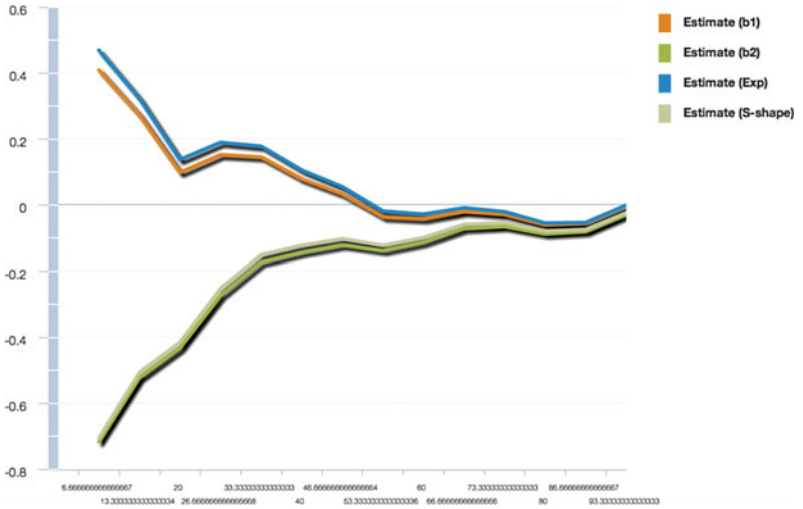

Fig. 13.2 The estimated predicted relative error

Brief Solution

Figure 12.11 means that the complexity of software component collision is large in the early debugging-process of open source solution.

13.4 Exercise 4

Figure 13.4 shows the estimated numbers of remaining faults in Eq. (9.22). Discuss the remaining faults on 15 days for each model in Fig. 13.4.

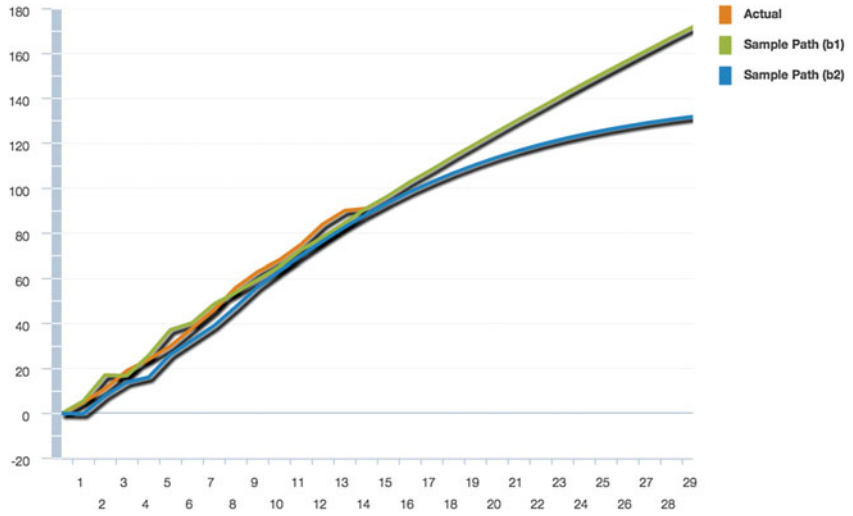

Fig. 13.3 The estimated sample path of stochastic differential equation model

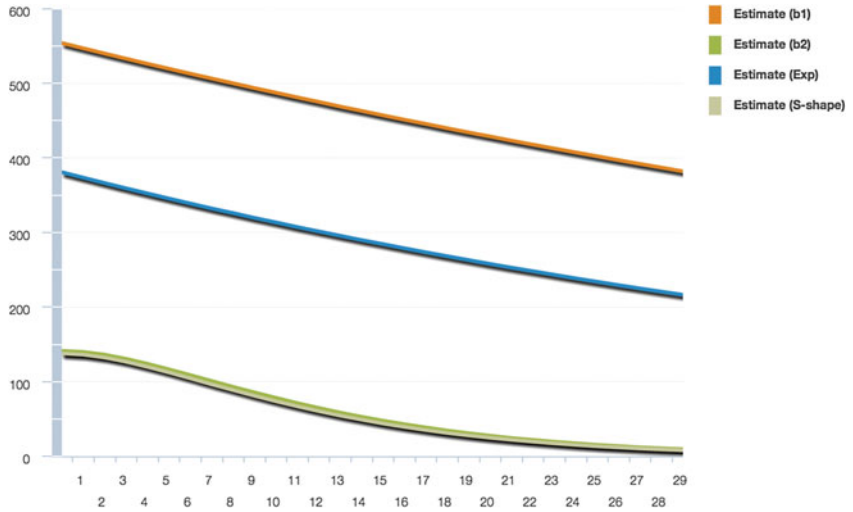

Fig. 13.4 The estimated remaining faults

Brief Solution

In Fig. 13.1, the estimated numbers of remaining faults is about 50 faults in case of "Estimate (S-shape)" on 15 days.