

# 作業(三)

繳交期限：11/15 23:59

繳交方式：教學平台

- 第九版課本：第23章－習題 23.5 及 23.6
  - 第八版課本：第5章－習題 5.6 及 5.7
    - 習題5.6
      - 習題23.5(5.6)：規劃圖23.14(圖5.15)中屬於一個軟體專案的16件工作，並依照專案時程畫出長條圖(bar chart)
    - 習題5.7
      - 習題23.6(5.7)：因未預料的意外，使工作T5必須由10天延長至40天，請畫出變化後的長條圖(bar chart)
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‘Achievements and Challenges in Cocomo-based Software Resource Estimation’. This article presents a history of the COCOMO models and influences on these models, and discusses the variants of these models that have been developed. It also identifies further possible developments in the COCOMO approach. (B. W. Boehm and R. Valeridi, *IEEE Software*, **25** (5), September/October 2008.) <http://dx.doi.org/10.1109/MS.2008.133>.

## EXERCISES

- 23.1.** Under what circumstances might a company justifiably charge a much higher price for a software system than the software cost estimate plus a reasonable profit margin?
- 23.2.** Explain why the process of project planning is iterative and why a plan must be continually reviewed during a software project.
- 23.3.** Briefly explain the purpose of each of the sections in a software project plan.
- 23.4.** Cost estimates are inherently risky, irrespective of the estimation technique used. Suggest four ways in which the risk in a cost estimate can be reduced.
- 23.5.** Figure 23.14 sets out a number of tasks, their durations, and their dependencies. Draw a bar chart showing the project schedule.
- 23.6.** Figure 23.14 shows the task durations for software project activities. Assume that a serious, unanticipated setback occurs and instead of taking 10 days, task T5 takes 40 days. Draw up new bar charts showing how the project might be reorganized.
- 23.7.** The XP planning game is based around the notion of planning to implement the stories that represent the system requirements. Explain the potential problems with this approach when software has high performance or dependability requirements.
- 23.8.** A software manager is in charge of the development of a safety-critical software system, which is designed to control a radiotherapy machine to treat patients suffering from cancer. This system is embedded in the machine and must run on a special-purpose processor with a fixed amount of memory (256 Mbytes). The machine communicates with a patient database system to obtain the details of the patient and, after treatment, automatically records the radiation dose delivered and other treatment details in the database.

The COCOMO method is used to estimate the effort required to develop this system and an estimate of 26 person-months is computed. All cost driver multipliers were set to 1 when making this estimate.

Explain why this estimate should be adjusted to take project, personnel, product, and organizational factors into account. Suggest four factors that might have significant effects on the initial COCOMO estimate and propose possible values for these factors. Justify why you have included each factor.

Task	Duration (days)	Dependencies
T1	10	
T2	15	T1
T3	10	T1, T2
T4	20	
T5	10	
T6	15	T3, T4
T7	20	T3
T8	35	T7
T9	15	T6
T10	5	T5, T9
T11	10	T9
T12	20	T10
T13	35	T3, T4
T14	10	T8, T9
T15	20	T2, T14
T16	10	T15

**Figure 23.14**  
Scheduling example

- 23.9.** Some very large software projects involve writing millions of lines of code. Explain why the effort estimation models, such as COCOMO, might not work well when applied to very large systems.
- 23.10.** Is it ethical for a company to quote a low price for a software contract knowing that the requirements are ambiguous and that they can charge a high price for subsequent changes requested by the customer?

## REFERENCES

Beck, K. (2000). *extreme Programming Explained*. Reading, Mass.: Addison-Wesley.

Boehm, B. 2000. 'COCOMO II Model Definition Manual'. Center for Software Engineering, University of Southern California. [http://csse.usc.edu/csse/research/COCOMOII/cocomo2000.o/CII\\_modelman2000.o.pdf](http://csse.usc.edu/csse/research/COCOMOII/cocomo2000.o/CII_modelman2000.o.pdf).