



Assignment: Estimation

CS350 Spring, 2016

Due Date: March 24, 2016

Read the chapter 33 in the textbook, SEPA. Answer to the following questions.

1. Assume that you are the project manager for a company that builds software for household robot. You have been contracted to build the software for a robot that mows the lawn for a homeowner. Write a statement of scope that describes the software. Be sure your statement of scope is bounded. If you are not familiar with robots, do a bit of research before you begin writing. Also, state your assumptions about the hardware that will be required.

Alternate: Replace the lawn mowing robot with another problem that is of interest to you.

2. Do a functional decomposition of the robot software described above. Estimate the size of each component in LOC. Assuming that your organization produces 600 LOC/pm with a labor rate of 5,000,000 won per pm. Estimate the effort and cost required to build the software.

Download the user's manual and COCOMO II tool from csse.usc.edu. Read the manual carefully and answer to the following questions. For the each answer capture the screenshot for each output and use it for your answers.

3. Suppose you are managing the development of a safety-critical software system that is designed to control a radiotherapy machine to treat patients suffering from cancer. The estimated size of the system is 250KSLOC. 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 II is used to estimate the effort required to develop this system.

- 1.1. Estimate the effort and schedule for the development of the system using all

nominal cost driver ratings.

1.2. Explain why this estimate should be adjusted to take project, personnel, product and organizational factors into account.

1.3. Suggest four factors that might have significant effects on the initial COCOMO II estimate and propose possible values for these factors and Justify why you have included each factor.

4. Suppose you have two 1,000 KSLOC programs to develop. Both are nominal, except that one has very high complexity and the other very low. You also have two teams of analysts and programmers, one with very high analyst and programmer capabilities and the other with very low. You have two staffing options:
- (a) Staff the very high complexity job with the very high capability personnel, and vice versa.
 - (b) Staff the very high complexity job with the very low capability personnel, and vice versa.

What is the total effort required to develop the two programs for two options?

How do you think the two options would compare with respect to the likely morale and job satisfaction of the two teams?