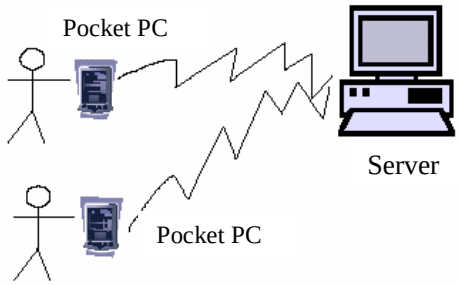
BLG411E - Software Engineering
Midterm Exam - 07.11.2006

- Books and notes are closed.
- Exam help sheet, calculator, and dictionary are allowed.
- Exam duration is 1.5 hours.

PROBLEM (70 points)

Suppose that you will develop software for railway station employees. Every employee will have his Pocket PC on which he can see tasks that are assigned to him. A manager will be responsible to assign tasks to persons by entering all information (employee ID, employee name, employee title; task ID, task description, date and time of task, assigned person to task, and status of task). All information will be saved in a central server to which the employees can communicate (wireless) via their pocket PCs. The manager will also get a weekly report of tasks; query the status of a task, or query a person's tasks. An employee can only see his information, or modify the status of his tasks as "completed". You will develop the software for pocket PC (graphical user interface and communication part), and also the software for the server.



1) (35 points)

a) Using the Function Points method, estimate the LOC for the software. Assume that the implementation will be in C language with a 130 LOC/FP.
b) Using the Basic COCOMO method, estimate the effort and the development time; and determine number of people.
c) Identify the main activities and draw a Task Network.
d) Distribute the activities among the project members and draw a Gantt Diagram.

2) (35points)

a) Draw an entity-relationship diagram.
b) Draw level-1 data flow diagram.
c) Draw hierarchical architectural design chart.

TEST QUESTIONS (30 points)

1) Most software continues to be custom built because
a. Component reuse is common in the software world
b. Reusable components are too expensive to use
c. Software is easier to build without using someone else's components
d. Off the shelf software components are not commonly available

2) Which is the first phase of the Waterfall software process model?
a. design
b. prototype
c. requirement
d. implementation

3) The prototyping model of software development is
a. A reasonable approach when requirements are well defined
b. A useful approach when a customer cannot define requirements clearly
c. The best approach to use for projects with large development teams
d. A risky model that rarely produces a meaningful product

4) The objective of software project planning is to
a. convince the customer that a project is feasible
b. make use of historical project data
c. enable a manager to make reasonable estimates of cost and schedule
d. determine the probable profit margin prior to bidding on a project

5) Software risk impact assessment should focus on consequences affecting
a. planning, resources, cost, schedule
b. marketability, cost, personnel
c. business, technology, process
d. performance, support, cost, schedule

6) For purposes of determining the major engineering tasks and distributing them on the project time line, the project manager should assume that the process model used is
a. linear sequential
b. iterative
c. evolutionary
d. any of the above

7) A key concept of quality control is that all work products
a. are delivered on time and under budget
b. have complete documentation
c. have measurable specifications for process outputs
d. are thoroughly tested before delivery to the customer

8) What types of models are created during software requirements analysis?
a. functional and behavioral
b. algorithmic and data structure
c. architectural and structural
d. usability and reliability

9) The data flow diagram
a. depicts relationships between data objects
b. depicts functions that transform the data flow
c. specified major logical decisions as they occur
d. indicates system reactions to external events

10) Performing a grammatical parse of the processing narrative is the good first step to take in producing a
a. data dictionary
b. data flow diagram
c. entity relationship diagram
d. state transition diagram

11) The control hierarchy represents the
a. decision order
b. organization of modules
c. repetition of operations
d. sequence of processes

12) PDL focuses on the
a. control hierarchy in a more abstract sense
b. processing details of each module individually
c. processing details of each the set of modules collectively
d. relationship between control and procedure

13) A necessary supplement to transform or transaction mapping needed to create a complete architectural design is
a. entity relationship diagrams
b. the data dictionary
c. processing narratives for each module
d. test cases for each module

14) In transaction mapping the first level factoring results in the
a. creation of a CFD
b. derivation of the control hierarchy
c. distribution of worker modules
d. refinement of the module view

15) In general, flowcharts should
a. be used in place of programming design languages
b. be used to document the entire design or not at all
c. only be used to document or evaluate design in specific instances
d. none of the above