Linköpings universitet
Institutionen för datavetenskap
Mariam Kamkar

Tentamen i TDDC23 Programvarutestning
## måndag den 13 augusti 2007

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- **Inga hjälpmedel.**
- **Frågorna är på engelska p.g.a. kurslitteratur, ni kan välja att svara på svenska eller engelska.**

Mariam Kamkar: 070-9191949

Lycka till

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1. Name different level of testing. (1 p)

2. Complete the following sentence: (2 p)

   Objective of unit and integration testing: to ensure that ...

3. Give the Applicability, Disadvantage and Advantage of White-box testing. (2 p)

4. What is Exhaustive testing? (1 p)

5. Identify the Equivalence Classes for the following specification. (2 p)

   Specification: the program accepts three to five inputs which are 4 digit integers greater than 1000.

6. Develop decision table test cases for the following triangle program: (3 p)

   The program accepts three integers, *a*, *b*, and *c* as input. The three values are interpreted as representing the lengths of sides of a triangle. The integers *a*, *b*, and *c* must satisfy the following conditions:

   C1: $1 <= a <= 200$
   C2: $1 <= b <= 200$
   C3: $1 <= c <= 200$
   C4: $a < b + c$
   C5: $b < a + c$
   C6: $c < a + b$

7. Generate test cases from the decision table you developed for triangle program in the previous exercise. (2 p)

8. Name and describe two different testing paradigms. (2 p)

9. The following figure illustrates the component hierarchy in a software system. Describe the sequence of tests for integration the components using a *bottom-up* approach and a *sandwich* approach. (4 p)
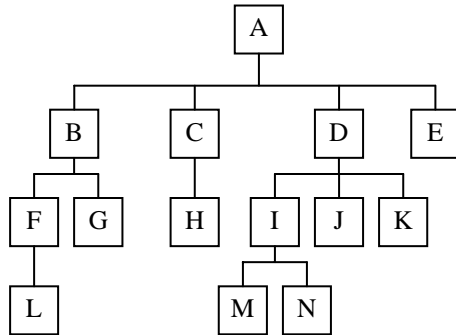
10. Find the *source* and *sink* nodes in the following graph with MM-path, module A calls module B, which in turn calls module C. (3 P)
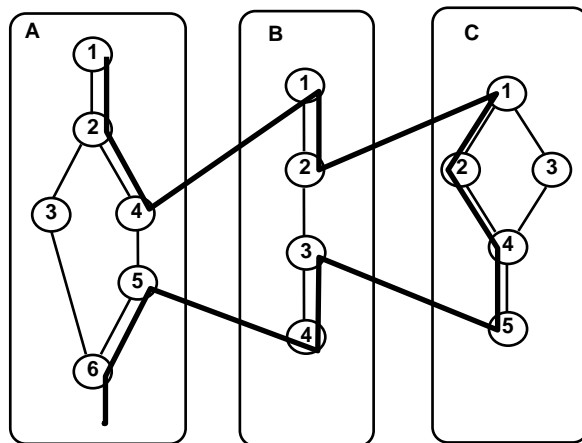
11. Based on *source* and *sink* nodes find the module execution paths (MEP) in the graph. (4p)

    MEP (A, I) =
    MEP (A, II) =
    MEP (A, III) =
    MEP (B, I) =
    MEP (B, II) =
    MEP (C, I) =
    MEP (C, II) =

12. Describe test stubs and drivers. When are they needed, and why? (2 p)

13. *Specification*: the character in column 1 must be an "N" or a "P". The character in column 2 must be a digit. In this situation, the file update is made. If the first character is incorrect, message M-1 is issued. If the second character is not a digit, message M-2 is issued.

Based on this specification: (5 p)

- Identify causes and effects
- Design a cause-effect graph with constraint from identified causes and effects
- Propose a decision table for testing the software

14. Explain the three following Scripting techniques. (3 p)

    - Linear
    - Structured
    - Keyword-driven

15. Early data flow analysis often centered on a set of faults that are known as define/reference anomalies.

Given the following notations and the control flow graph annotated with define-use-kill information, for each variable examine the *define-use-kill* patterns along the control flow graph and the kind of anomaly it could generate. (3 p)

- **d**: defined, created, initialized, etc.
- **k**: killed, undefined, released
- **u**: used for something
- **~d**: the variable does not exist, then it is defined
- **~u**: the variable does not exist, then it is used
- **~k**: the variable does not exist, then it is killed
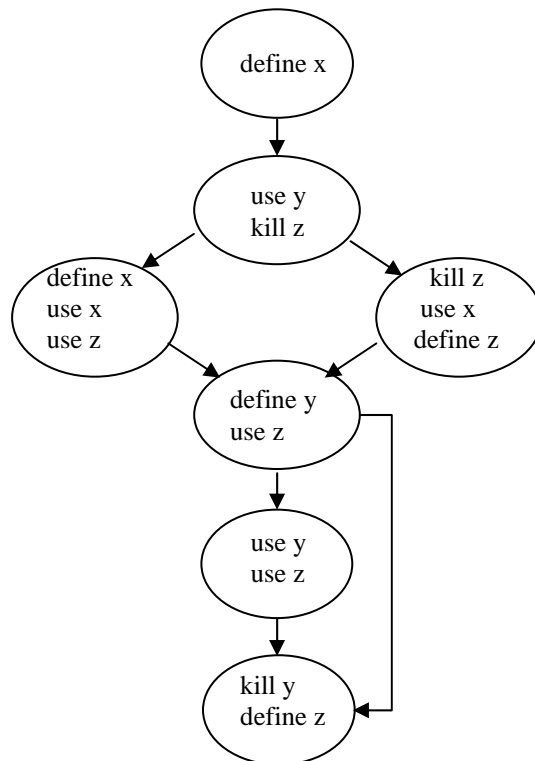
16. What is regression testing? (1 p)