Information Systems Analysis & Design (M8748)

Tutorial 10 Answer

1. What are the two main purposes of an operation specification?
    They confirm that the logic of user requirements has been understood correctly and documented accurately. They provide designers and programmers with a detailed and unambiguous basis for the design and implementation of system behavior.

2. To what kinds of situation are decision tables particularly suited?
    Decision tables are particularly suited to representing decisions with complex multiple input conditions and complex multiple outcomes, where the precise sequence of steps either is not significant or is not known.

3. Why is it important to specify both pre- and post-conditions for an operation?
    Pre-conditions allow the user and analyst to agree the precise conditions under which it should be possible for an operation to run. Similarly, post-conditions specify the intended state of the system after the operation has executed. This information can be used later by a program designer to specify the operation, by a programmer to code it and by a tester to check whether it works as intended. Together, pre- and post-conditions describe an operation's interface to the rest of the system.

4. What are the main differences between algorithmic and non-algorithmic approaches to operation specification?
    Algorithmic specification techniques describe the sequence of internal logical steps that an operation is to follow. Non-algorithmic techniques describe the result for a given set of inputs.

5. Why are non-algorithmic (or declarative) approaches generally preferred in object-oriented development?
    Non-algorithmic methods of operation specification emphasize encapsulation.

6. Why are operation specifications in an object-oriented project likely to be small?
    Chiefly because it is an explicit aim of object interaction modeling to develop a set of classes that are relatively simple in their definition and single-minded in their functionality. As a result, operations are also usually simple. Complex functionality is achieved through collaboration between a numbers of objects.

7.   What are the three kinds of control structure in Structured English?

Sequence, selection and iteration.

8.   What is a sensible limit on the size of a Structured English specification?

The usual rule of thumb is a single page of A4 or a single screen of text. This is based on the belief that any specification that can not be viewed all at once is too complex to be easily understood.

9.   What are the three components of most OCL expressions?

OCL expressions usually consist of:
*   A context within which the expression is valid (for example, a specified class);
*   A property within the context to which the expression applies (for example, an attribute of the specified class);
*   An operation that is applied to the property (for example, a mathematical expression that tests the value of the attribute).

10. What is an invariant?

A condition that always holds true (for example, a relationship between the values of two attributes), and which must therefore not be altered by an operation side effect.