

Discovering Classes

Contents:

1. Noun phrase approach
2. Common class patterns
3. Use case driven
4. CRC cards
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Literature

1. *Requirements analysis and system design: developing information systems with UML*, Leszek A. Maciaszek, Addison-Wesley, 2001, Chapter 4.2.1.

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Noun Phrase Approach

- Nouns are considered candidate classes
- Three kinds of candidate classes
 - Relevant
 - Irrelevant (can be skipped)
 - Fuzzy

Disadvantage

- Assumes that the Requirements Document is complete and correct

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Common Class Pattern Approach

- Derives candidate classes from the classification theory of objects
- Candidate classes and objects come from one of the following sources:
 - tangible things: e.g. buildings, cars,
 - roles: e.g. teachers, students
 - events: things that happen at a given date and time, or as steps in an ordered sequence, e.g. landing, request, interrupt
 - interactions: e.g. meeting, discussion
 - places: areas set aside for people or things, e.g. travel office
 - organisations: formally organised collections of people, resources, facilities, e.g. departments
 - concepts: principles or ideas not tangible, e.g. reservations
 - other systems: external systems with which the application interacts

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Disadvantages of the common class pattern approach

- Just a guidance
- Only loosely bound to user requirements
- Possible naming misinterpretations

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Use Case Driven Approach

- The scenarios - use cases that are fundamental to the system operation are enumerated.
- Walks through each scenario leads to the identification of the objects, the responsibilities of each object, and how these objects collaborate with other objects.
- Function-driven (problem-driven)

Disadvantage

- Relies on the completeness of use case models.

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CRC Cards

- Effective way to analyse scenarios.
- Identifies classes from the analysis of how objects collaborate to perform business functions (use cases)
- CRC card contains:
 - name of the class,
 - responsibilities of the class,
 - collaborators of the class.

Class name	
Responsibilities	Collaborators
Attributes	
Operations	

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Mixed Approach

One possible scenario:

- Initial classes – domain knowledge
- Common class patterns approach to guide
- Noun phrase approach to add more classes
- Use case approach to verify
- CRC to brainstorm

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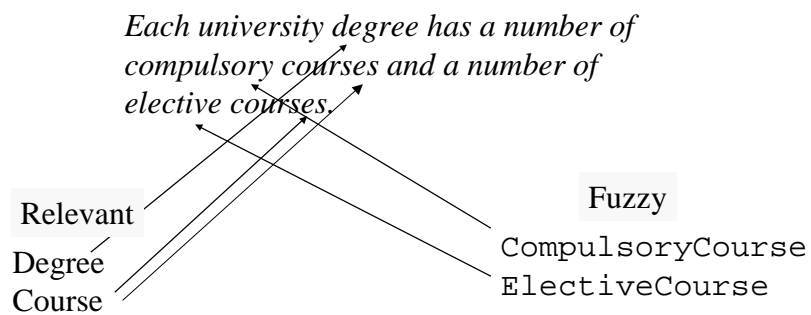
Example

- Consider the following requirements for the University Enrolment system and identify the candidate classes:

Each university degree has a number of compulsory courses and a number of elective courses.

Relevant
Degree
Course

Fuzzy
CompulsoryCourse
ElectiveCourse



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More requirements:

1. *Each course is at a given level and has a credit-point value.*
(Course attributes)
2. *A course can be part of any number of degrees.* (possible association)
3. *Each degree specifies minimum total credit points value required for degree completion.* (Degree attributes)
4. *Students may combine course offerings into programs of study suited to their individual needs and leading to the degree in which enrolled.*

Relevant classes	Fuzzy classes
Course	CompulsoryCourse
Degree	ElectiveCourse
Student	StudyProgram
CourseOffering	

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- Consider the following additional requirements:

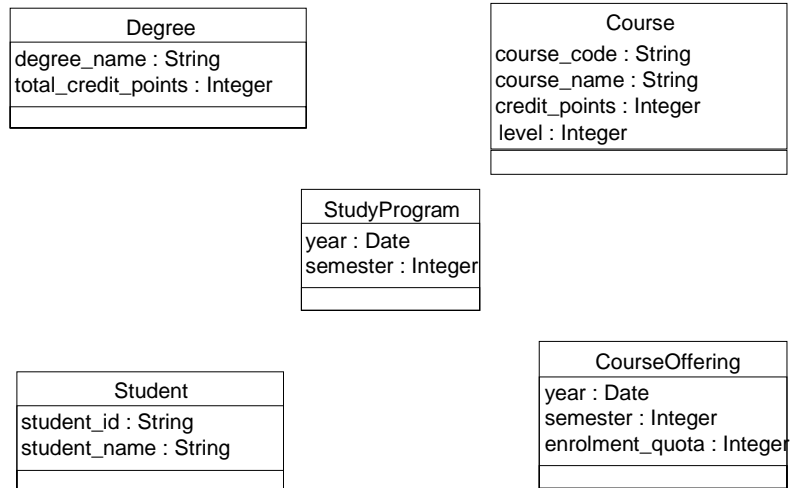
A student's choice of courses may be restricted by timetable clashes and by limitations on the number of students who can be enrolled in the current course offering.

CourseOffering
year: Date
semester : Integer
enrolment_quota : Integer

To each student a programme of study is assigned.

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Class Specification for the University Enrolment



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Summary

- Approaches in class discovering analysis are: noun phrase, common class patterns, use case driven, CRC cards, mixed.
- Class discovering is an iterative and incremental process.

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