Class, Responsibility, and Collaboration

CSC207 Summer 2017



CRC Cards

- A tool and method for systems analysis and design.
- Part of the Object-Oriented development paradigm.
- Highly interactive and human-intensive.
- Final result: definition of classes and their relationships.
- What rather than How.
- Benefits:

Cheap and quick: all you need is index cards.

Simple, easy methodology.

Forces you to be concise and clear.

Input from every team member.

What is a CRC Card?

CRC stands for Class, Responsibility and Collaboration.

Class

- An object-oriented class name
- Include information about super- and sub-classes

Responsibility

- What information this class stores
- What this class does
- The behaviour for which an object is accountable

Collaboration

- Relationship to other classes
- Which other classes this class uses

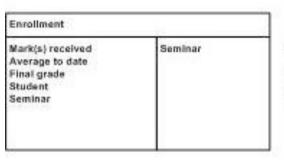
What does a CRC Card Look Like?

Class	Student		
	Student number Name Address Phone number Enrol in seminar Drop a seminar Request transcript	Seminar	

Responsibilities

Collaborations

CRC Model



""See the prototype"*
Determine average mark

Professor
Enrollment

Seminar Professor Student Enrollment Room	"See the prototype"
-	

Room	
Building Room number Type (Lab, class,) Number of Seats Get building name Provide available time slots	Building

Professor

Name
Address
Phone number
Email address
Salary
Provide information
Seminars instructing

Seminar		
Name Seminar number Fees Walting list Enrolled students Instructor Add student Drop student	Student Professor	

Student	
Name Address Phone number Email address Student number Average mark received Validate identifying info Provide list of seminars taken	Enrollment

It specifies the Object-
Oriented Design (OOD)
of the software system.

collection of CRC cards.

• A CRC Model is a

Building		
Building Name Rooms Provide name Provide list of available rooms for a given time period	Room	

How to Create a CRC Model?

Typically, you are given a description (in English) of the requirements for a software system.

You work in a team.

Ideally, you all gather around a table.

You need a set of index cards and some pens.

Coffee / other beverages are optional.

How to Create a CRC Model?

Read the description. Again. And again.

Identify core **classes** (simplistic advice: look for nouns).

Create a card per class (begin with class names only).

Add responsibilities (simplistic advice: look for verbs).

Which other classes does this class need to talk to to fulfil its responsibilities? Add **collaborators**.

Add more classes as you discover them.

Put classes away if they become unnecessary. (But don't tear them up yet!)

Refine by identifying abstract classes, inheritance, etc.

Keep adding/refining until everyone on the team is satisfied.

How Can We Tell It Works?

A neat technique: a **Scenario Walk-through**.

Select a scenario and choose a plausible set of inputs for it.

Manually "execute" each scenario.

- Start with initial input for scenario and find a class that has responsibility for responding to that input.
- Trace through the collaborations of each class that participates in satisfying that responsibility.
- Make adjustments as necessary.
- Repeat until scenario has "stabilized" (that is, no further adjustments are necessary).