CRC

CSC207 Fall 2015

Computer Science
UNIVERSITY OF TORONTO

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 **C**lass, **R**esponsibility and **C**ollaboration.

- **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.
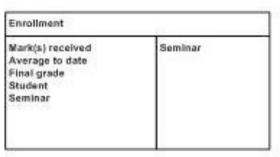 - Which other classes this class uses
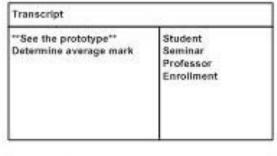
What does a CRC Card Look Like?

Class

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

Responsibilities

Collaborations

CRC Model

Professor

Name Address Phone number Email address Salary Provide information Seminars instructing	Seminar

Transcript

See the prototype Determine average mark	Student Seminar Professor Enrollment

Seminar

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

Enrollment

Mark(s) received Average to date Final grade Student Seminar	Seminar

Student Schedule

See the prototype	Seminar Professor Student Enrollment Room

Student

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

Room

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

- A **CRC Model** is a collection of CRC cards.

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

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).