Φροντιστήριο 3

Θέμα : Use Cases, Use Case Diagrams, Activity Diagrams

Ημερομηνία : 25 Οκτωβρίου 2005

Outline

- Use Case modelling concepts
- Use-case diagrams
- Activity diagrams

System behavior

- ## System behavior is the manner in which a system acts/reacts with its environment or supplementary components
  - The set of actions and activities of a system

- ## Use cases capture the system behavior
  - The interactions between the system and its environment (or parts) are described by use cases

What is a Use-Case Model?

- A model that describes the functional requirements of a system (in terms of use cases)

- A model of what the system is supposed to do (use cases) and its environment (actors)
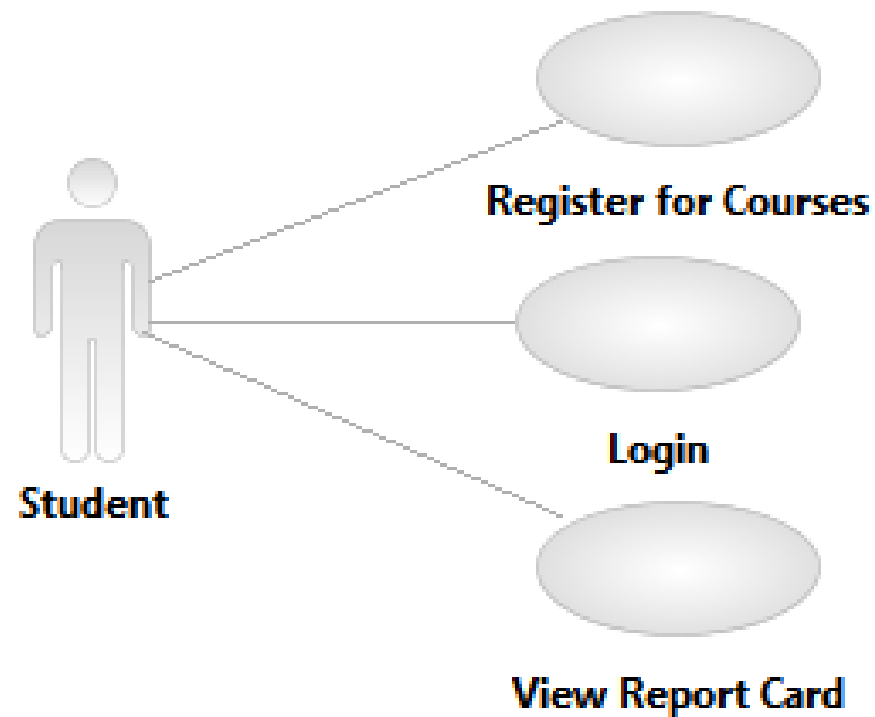
Major Concepts in Use-Case Modeling

- An actor represents anything that interacts with the system

Actor

- A use describes a sequence of events performed by the system that yield an observable result of value to a particular actor
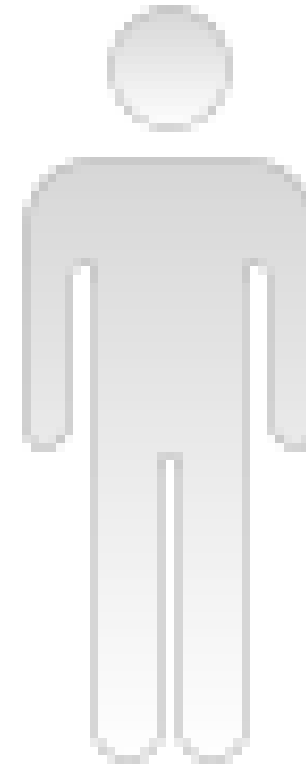

Use case

Use-case diagrams

- Use Case modelling concepts
- **Use-case diagrams**
- Activity diagrams

What is an Actor?

- Actors represent the role a user can play in the system
- They may represent a human or another device (event a system)
- They can actively interchange information with the system
- They can be a giver of information
- They can be passive receivers of information
- They are NOT parts of the systems

Actor

What Is a Use Case?

- Defines a set of use-case instances, where each instance is a sequence of actions a system performs that yields an observable result of value to a particular actor.
  - A use case models a dialogue between one or more actors and the systems
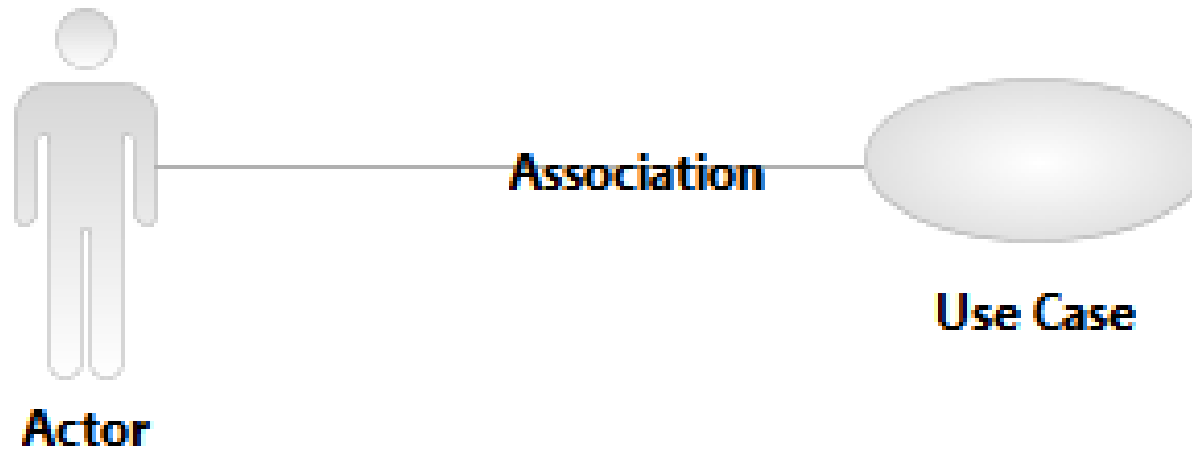 - A use case describes the actions the system takes to deliver something of value to the actor
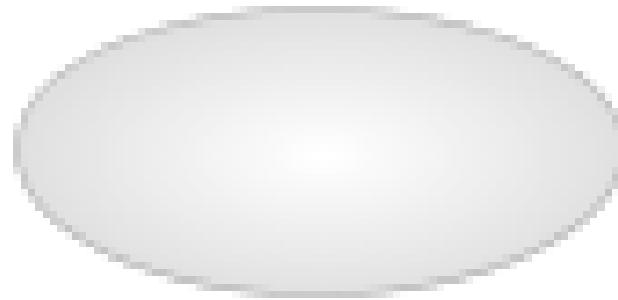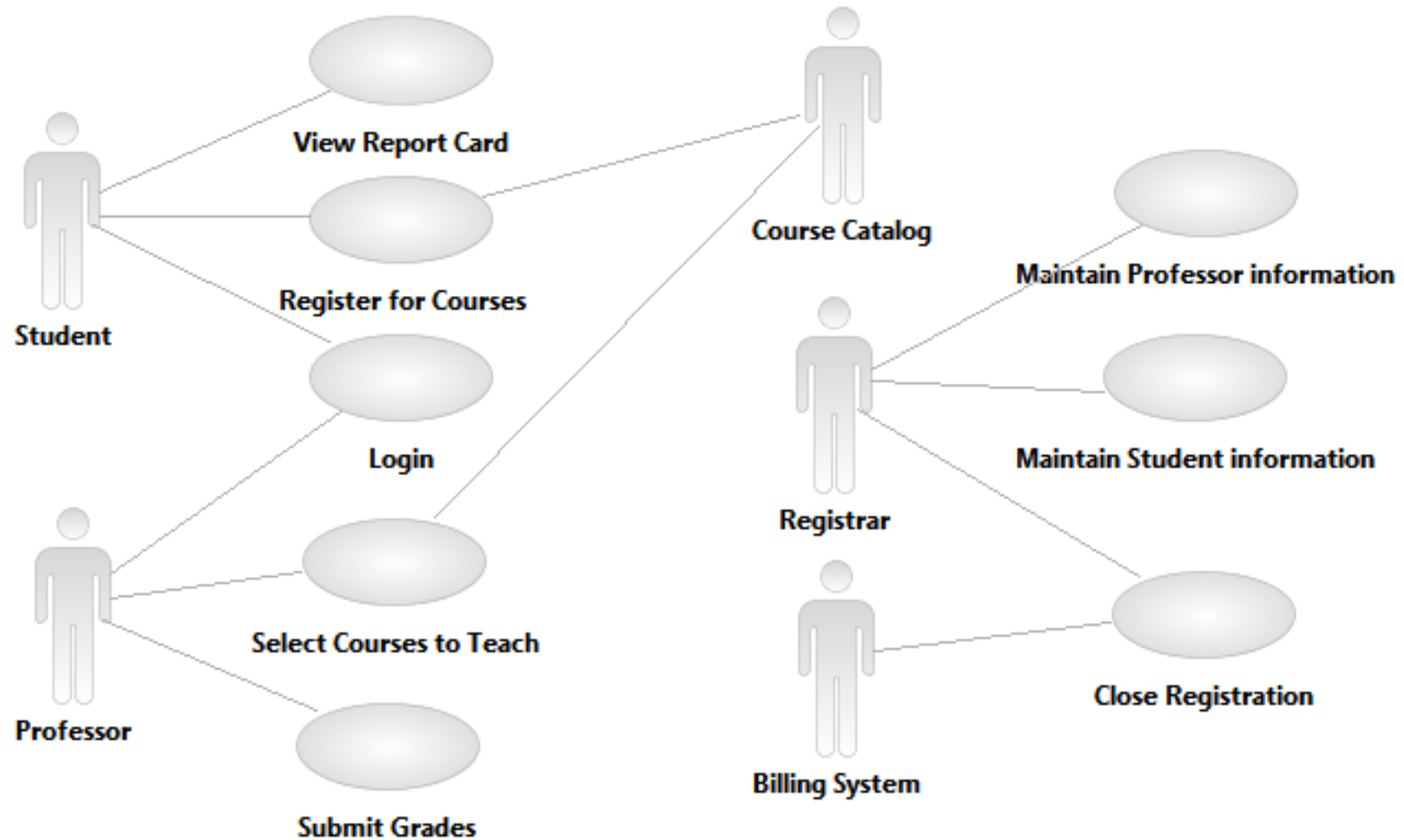
Use case

Use Cases and Actors

- A use case models a dialog between actors and the system
- A use case is initiated by an actor to invoke a certain functionality in the system

Student

View Report Card

Register for Courses

Login

Course Catalog

Registrar

Maintain Professor information

Maintain Student information

Professor

Select Courses to Teach

Submit Grades

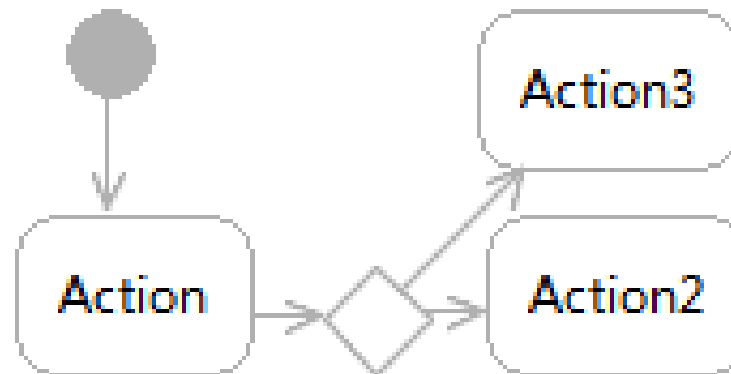**Billing System**

Close Registration

Activity Diagrams

- Use Case modelling concepts
- Use-case diagrams
- **Activity diagrams**
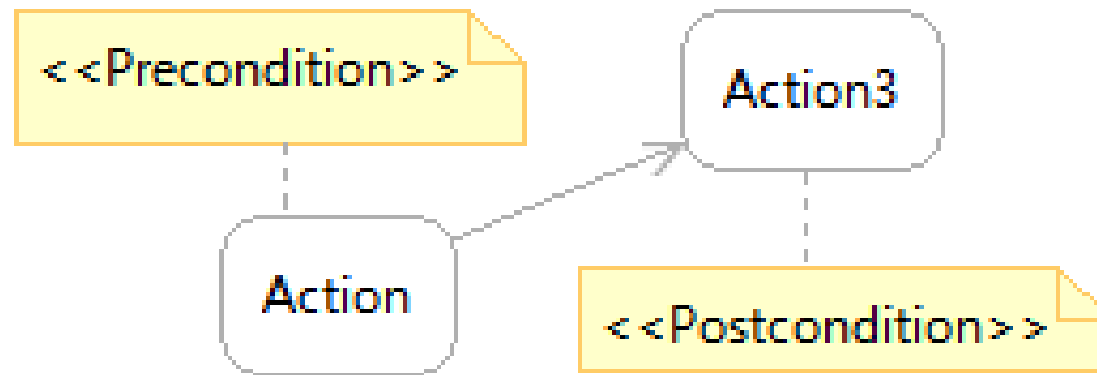
What Is An Activity Diagram?

- An activity diagram in the use-case model can be used to capture the activities and actions performed in a use case
- It is essentially a flow chart, showing flow of control from one activity or action to another

What Is An Activity?

- A specification of behavior expressed as a flow of execution via sequencing of subordinate units.
  - Subordinate units include nested activities and ultimately individual actions.
- May contain boolean expression constraints when the activity is invoked or exited
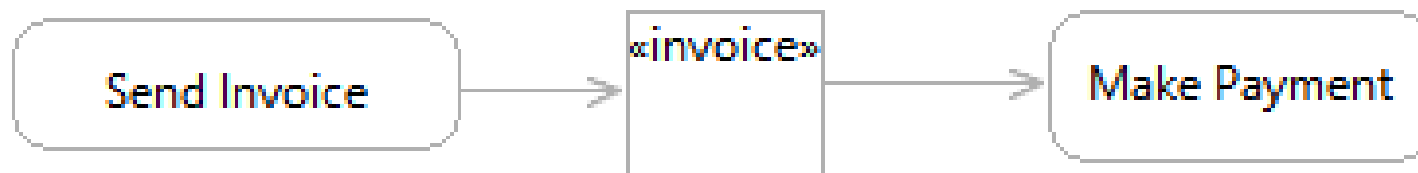
Control flow vs Object flow

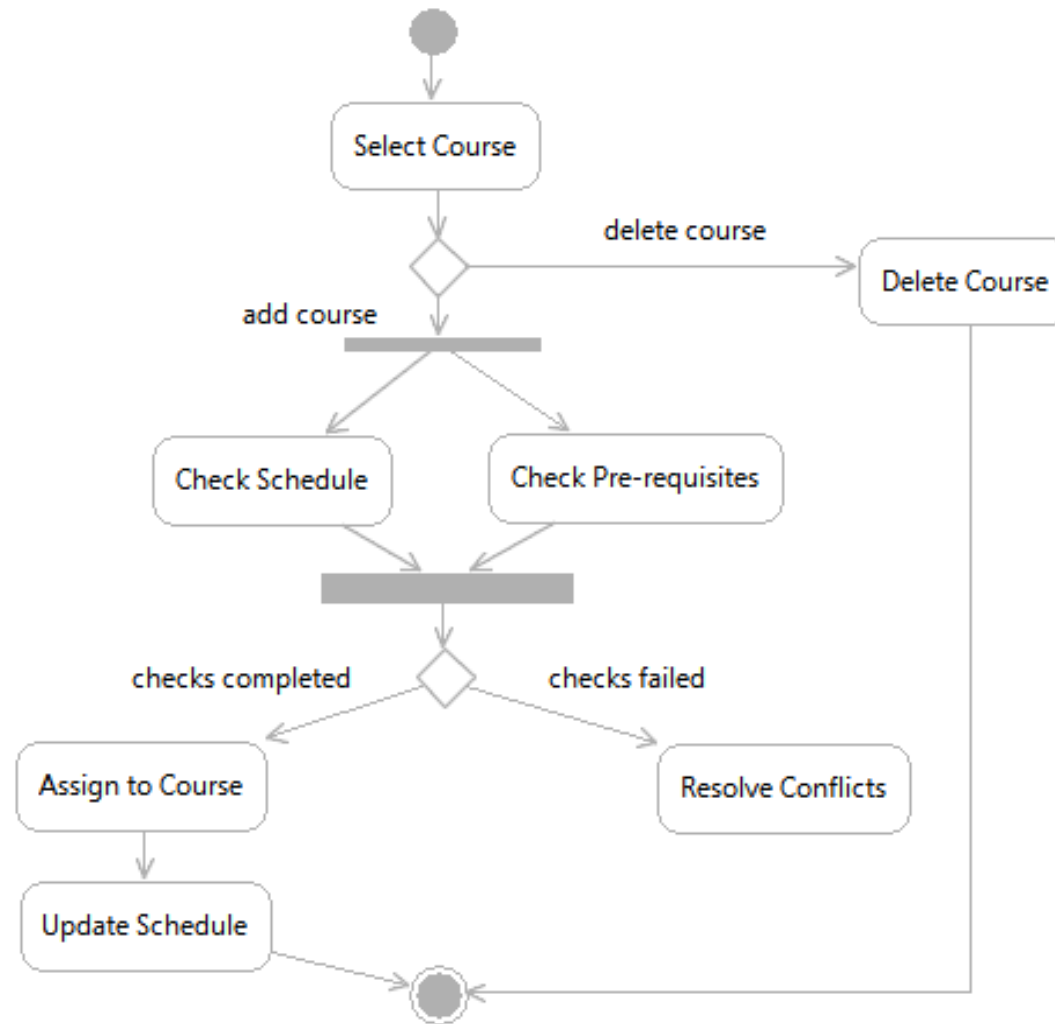- A control flow shows the flow of control from one action to the next.

```
┌──────────────┐            ┌──────────────┐
│ Send Payment │ ─────────▶ │ Accept Payment│
└──────────────┘            └──────────────┘
```

- An object flow is shown as a connector with an arrowhead denoting the direction the object is being passed

```
┌──────────────┐     ┌──────────┐     ┌──────────────┐
│ Send Invoice │ ──▶ │«invoice» │ ──▶ │ Make Payment │
└──────────────┘     └──────────┘     └──────────────┘
```

Activity Diagram

IBM Rational Software Modeler

- **Use Case Diagrams**
  - Isa, Extension, Inclusion

- **Activity Diagrams**
  - Input Pins/Output Pins
  - Partitions
  - Signals
  - Regions

- **Online book**
  - http://publib.boulder.ibm.com/infocenter/rtnl0600/basic/tocView.jsp?toc=/com.ibm.rational.rsm.books/RSMBook.xml