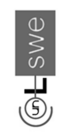
Objects & Classes II

**Christian Rodríguez Bustos**

Object Oriented Programming 

Objects & Classes

Agenda

User defined

types

Last Class

Activity

Modeling

Classes

Working with

list of objects

Objects & Classes

User defined types

Data redundancy & Data integrity

Objects as attributes

Do you remember the Student ClasObjects & Classes

| **Type**  Long | String | String | String | Date | **int** |
| --- | --- | --- | --- | --- | --- |
| **Attribute**Id | User | First Name | Last Name | Birth Date | **Group Taught** |

Data redundancy !!! 

Objects & Classes

Number 3

Number 3

Group

Group



**Data redu**All studentto differe

Group





Number 3

Student A 

Student B 

Student C

**The new group**

**The old group**

**number is 1003**

**number is 3**

Changing enviroment 

Objects & Classes

**Lossinte**

All studentdifferentand probwork withobj

Loss of data integrity

Group 



Number **3**

****

****

Student A

Group

Number

1003 

Student B

Group 

Number

**1003**

****Student C

Objects & Classes

Objects as attributes

Solution is

**Objects as attributes**

Objects & Classes

**Avoi**

**redund**

**loss of d**All studethe sainst

Avoid data redundancy 





Student A

Student B

Group 

Number 3

Student C

Objects & Classes

Last Class activity

Class List

Class Definitions

Objects & Classes

Last Class activity

**Abstract the model to submit the grades ofstudent in the SIA (Classes, behaviors, attrietc) 1.**

Create a Java project in NetBeans or Eclipse 2.

Create the Java classes of the proposed mod3.

Encapsulate the classes 4.

Objects & Classes

Profes



Course

Class List



Student 

Objects & Classes





Grade

Group

Class Student

List of **User define**

| **Type**  Long | String | String | String | Date | List of Groups |
| --- | --- | --- | --- | --- | --- |
| **Attribute**Id | User | First Name | Last Name | Birth Date | Attends |

**objects** can be used

as attributes

Objects & Classes

Class Professor

| **Type**  Long | String | String | String | Date | List of Groups |
| --- | --- | --- | --- | --- | --- |
| **Attribute**Id | User | First Name | Last Name | Birth Date | Groups Taught |

Objects & Classes

Class Course

| **Type**  Long | String | List of Groups |
| --- | --- | --- |
| **Attribute**Number | Name | Offered As |

Objects & Classes

Class Grade

| Student  **Type** | Group | double |
| --- | --- | --- |
| **Attribute**Student | Group | Grade |

Objects & Classes

Class Group

Objects & Classes

| **Type**  Long | String Array | String Array | String | Course | Professor | List of Student | List of Grades |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Attribute**Number | Days Of Week | Times Of Day | Semester | Represents | Taught By | Attended By | Issue |

Modeling Classes

UML

UML Class Diagram

-purpose mUML is a standardized general

language

**Unified Modeling Lan**(**UML**) is a standardgeneral-purpose molanguage in the field of**oriented softwaengineering**

Objects & Classes

-purpose mUML is a standardized general

language

Objects & Classes

There are several

diagrams in UML for

**modeling object**

**oriented systems**

**Activity diagrams**

and **class diagrams**

are two examples

UML Class diagram

Describes the static

structure of a system

showing

– Classes:

• Name

• Attributes

• Methods

– Relationships between

classes

Objects & Classes

Showing classes

Objects & Classes Classes can be 

shown at different

detail level

Showing relationships between classObjects & Classes A Professor teaches one or mGroups

Showing relationships between classObjects & Classes A Professor teaches one orGroups

Showing relationships between classObjects & Classes Multiplicity

Multiplicity

Is the number of objects that particithe relationship

No instances, or one instance (optional,may) 0..1

Exactly one instance 1

Zero or more instances 0..\* or \* or 0..n

One or more instances (at least one)1..\*

Objects & Classes

From model to code 

Objects & Classes



Objects & Classes

Working with list of objects

Array List Basics

Objects & Classes

Array List Basics

Instantiation

Adding

elements

Objects & Classes

Array List Basics

Obtaining objects 

Obtaining list size

Objects & Classes

Iterating through Array Lists

Objects & Classes

Abstract the model to submit the grades of a sthe SIA (Classes, behaviors, attributes, etc)

Now is your turn for using your modObjects & Classes

1.

**Create a Java project in NetBeans or Eclip2.**

**Create the Java classes of the proposed m3.**

**Encapsulate the classes 4.**

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Objects & Classes