Object Oriented Design

CSC207 Fall 2015



UML

Unified Modeling Language (UML) allows us to express the design of a program before writing any code.

It is language-independent.

An extremely expressive language.

We'll use only a small part of the language, Class Diagrams, to represent basic OO design.

Example: Class Person

Name Data Person members # name : String [] # dob : String # gender : String + Person(name: String[], dob: String, gender: String) + getName(): String [] + setName(name: String[]) : void Methods + getDob(): String + setDob(dob: String) : void + getGender() : String + setGender(gender: String) : void + toString(): String

Notation

```
Data members:
 name: type
Methods:
 methodName(param1: type1, param2: type2,...): returnType
Visibility:
  private
```

+ public

protected

~ package

Static: underline

Example: Inheritance

protected variable accessible to child class

underline - static

```
Person
# name : String []
# dob : String
# gender : String
+ Person(name: String[], dob: String, gender: String)
+ getName(): String []
+ setName(name: String[]): void
+ getDob() : String
+ setDob(dob: String): void
+ getGender(): String
+ setGender(gender: String): void
+ toString(): String
                        Student
   - studentNum : String
   - studentCount : int = 0
   + Student(name: String[], dob: String,
         gender: String, studentNum: String)
   + getStudentNum(): int
   + toString(): String
   + getStudentCount(); int
```

The arrow indicates that Student is a subclass of Parent.

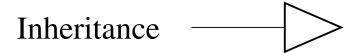
More Notation

Abstract method: italic

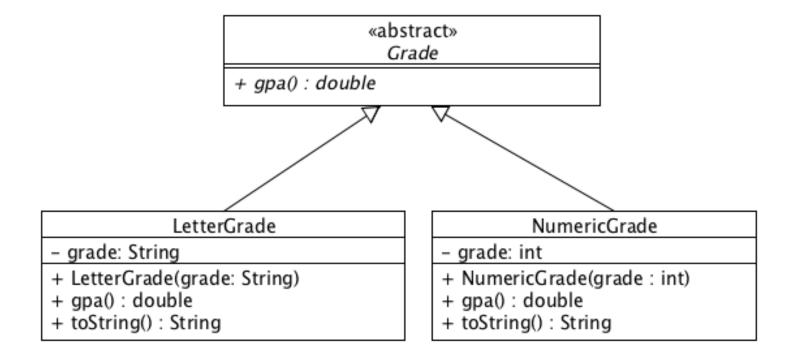
Abstract class: *italic* or <<abstract>>

Interface: <<interface>>

Relationship between classes:



Example: Abstract Class



Example: Abstract Class

+ gpa(): double

LetterGrade

- grade: String

+ LetterGrade(grade: String)

+ gpa() : double + toString() : String NumericGrade

- grade: int

+ NumericGrade(grade : int)

+ gpa() : double

+ toString(): String