

Computer Science 2704



Object-Oriented Software Design
and Construction with C++

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Fall 1999

Based on course slides of Todd Stevens, Spring 1999

Beginning



- Overview of the course
- Lab Accounts and Software
- Progression of Roles
- First Topics

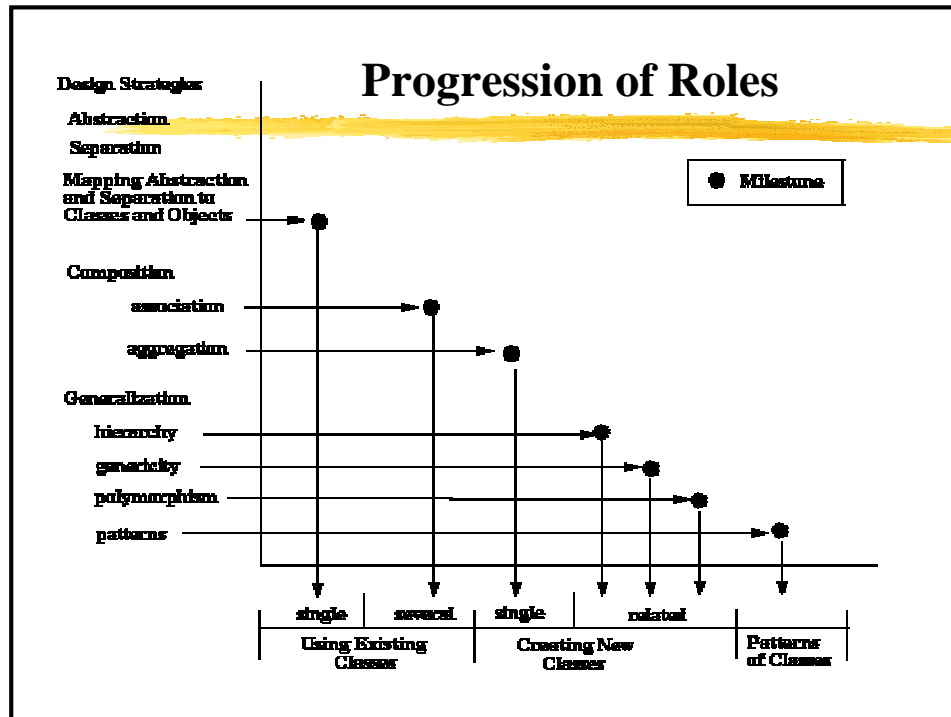
- abstraction
- separation

The URL for the class web page

`http://courses.cs.vt.edu/~cs2704/fall199/`

Lab accounts and software

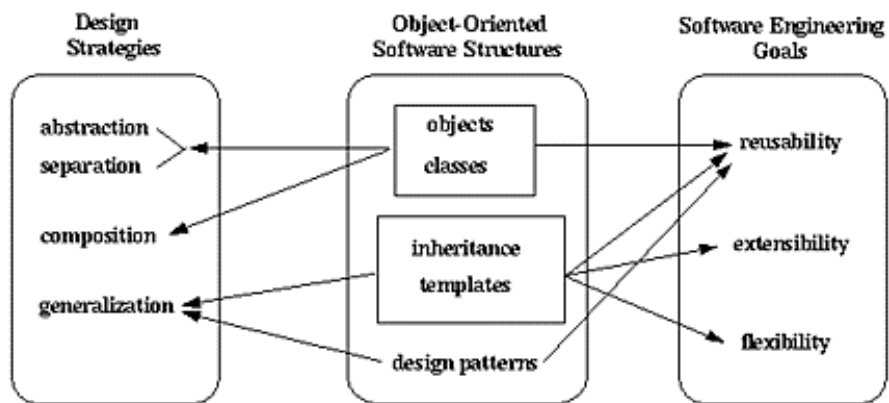
- If you do not have an account for the 116/118 lab, fill out the form being distributed (you must have a university PID).
- The software for the course is installed on all of the lab machines and should be used for your course work. You may also set up the software on your own machine.



Design Strategies in Object Oriented Programming

- Abstraction
 - modeling essential properties
- Separation
 - treat what and how independently
- Composition
 - building complex structures from simpler ones
- Generalization
 - identifying common elements

Connections among Strategies, Structures and Goals



Abstraction

- Modeling entities in software
- Only essential aspects should be captured
 - attributes
 - behavior

Artistic Abstraction



Wassily Kandinski, Cossacks, 1910-11

Practical Abstraction



Critique??

Abstraction



A named collection of attributes and behavior relevant to modeling a given entity for some particular purpose

Car:

Properties of a Good Abstraction



- well named
- coherent
- accurate
- minimal
- complete

Good Abstractions



MEN



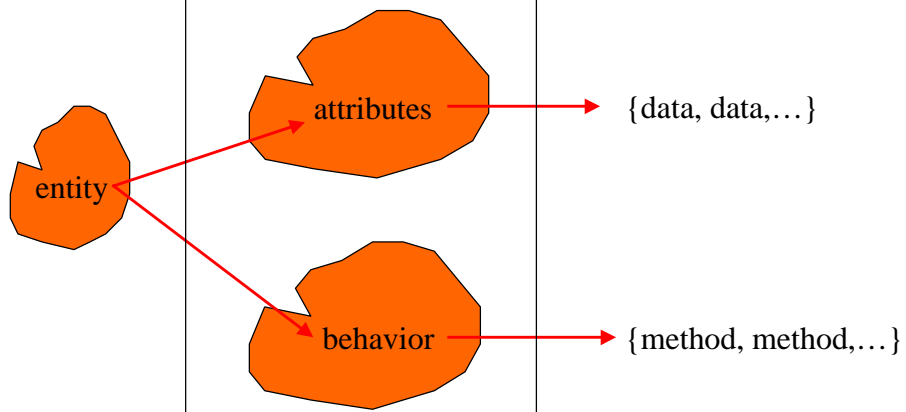
WOMEN

Mapping Abstraction to Software

real-world

abstraction

software



Separation

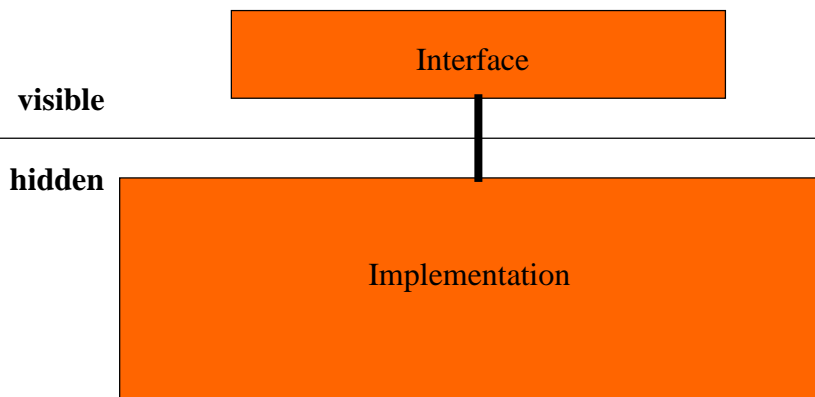
In object-oriented programming, the independent specification of an interface and one or more implementations of that interface.

What is to be done

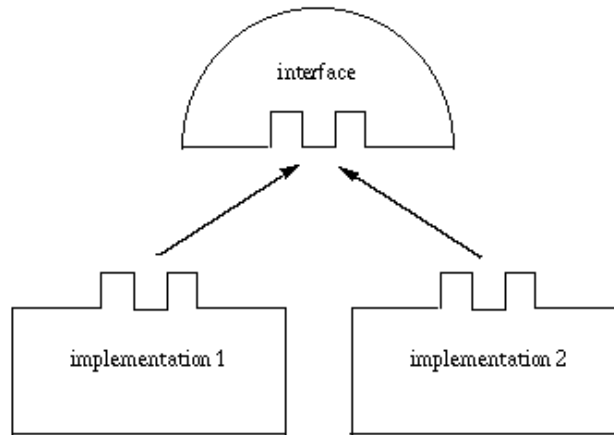
vs

How it is to be done

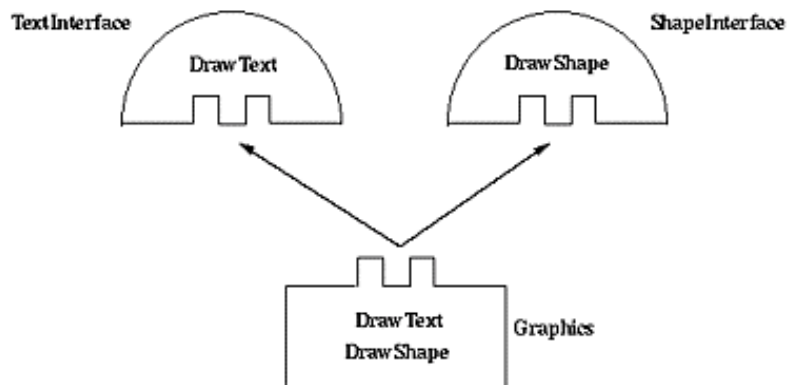
Separation



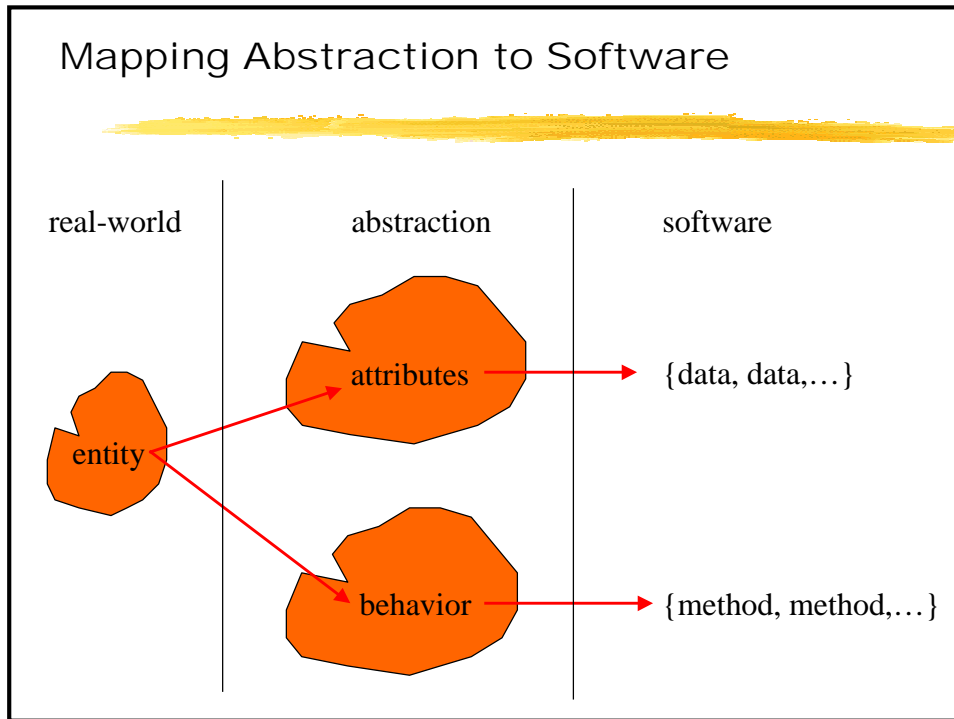
Separation of Interface from Implementation



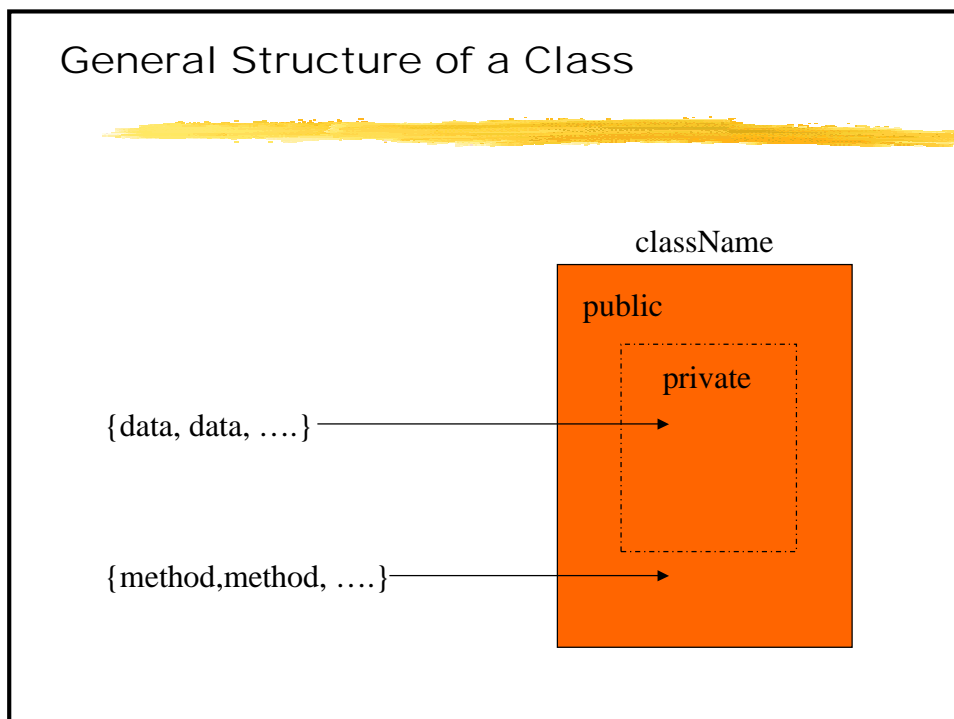
Interchangeability of Implementations



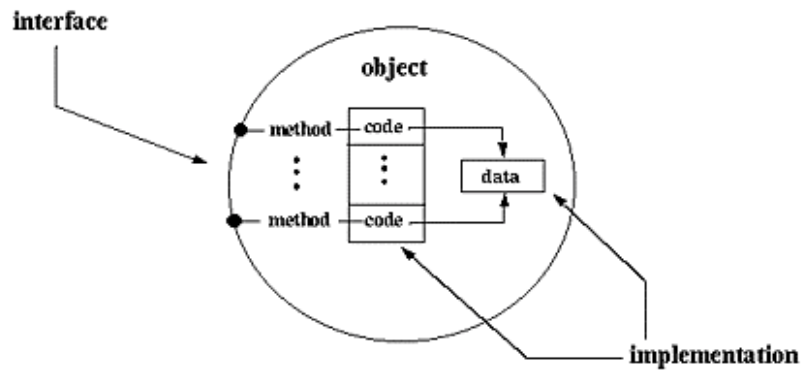
Mapping Abstraction to Software



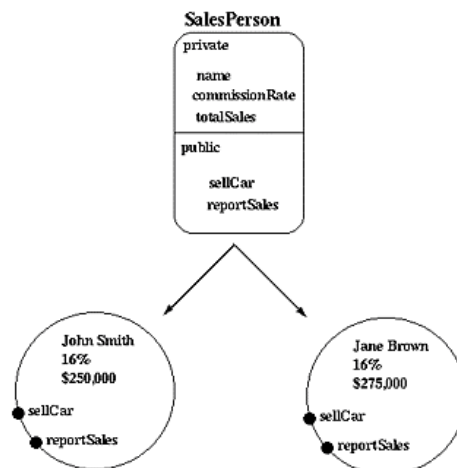
General Structure of a Class



General Structure of an Object



Multiple Instances of a Class



Software Engineering Goals

