Object Oriented Concepts

Modeling

- Analysis, Design, Program: Models
- Goal is to understand a system – we develop something that represents the system:
  - Mock-up
  - Mathematical functions ...
- Main question: how much detail?

Fundamental Object Oriented Concepts

- Encapsulation: Data and function packed together
- Inheritance: Acquiring the data functions from the base class
- Polymorphism: A function with the same name can act different for different classes

- Messages
- relations
- Object Based?

Example inheritance

Animal
  weight
  age: integer

Bird
  age
  wing

Fish
  Finns
  Tail
  Flipper
  Scale
  Eggs

Eggs

Bird b1;
b1.age = 20;
b1.Animal.age = 20;

Encapsulation

cup
weight
height
fill
drink

Data / Function Separation

1. 2. 3. 4. 5. 6. 7. 8. 9. 0.
+ - *
/ word length
~

10 digits display: at least 23 bits

~20 keys: 5 bits

data memory

10 bytes display: at least 25 bits

10 bytes: 5 bits

program memory
Name Conflict

Amphibic a1:
  a1.A = 5; /*???
  a1.land.A = 5;

Diamond Inheritance

Problems in Classification

Problems in classification - 2

Non-prioritized Classification Criteria

Object Based Media

- Visual BASIC (initial versions)
- Ada
- ...
Inheritance / Composition

vehicle

air-vehicle

land-vehicle

sea-vehicle

wheel

engine

body

System/subsystem structure

Message-processing

Events

Headquarters

Air-transport

Land-transport

Warehouse

Inventory

Accounting

Carriers

connection (messages)

Subject reference

Inheritance

Language Dependency

- Similar Models from Requirements to Coding
- Modeling should consider the coding language, since the beginning!