Object Oriented Software Development
Goal and Scope

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Three major merits of OOSD

• Project the real world into the computer as you recognize and understand it.
• Maintain the virtual world constantly corresponding to mismatches between the real world and the virtual world and evolution of the real world.

Object Oriented Analysis/Design/Programming

Iterative and Incremental

<table>
<thead>
<tr>
<th>OOA</th>
<th>OOD/OOP</th>
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<tbody>
<tr>
<td>Domain</td>
<td>Model</td>
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<tr>
<td>Definition of the problem</td>
<td>Construction of the solution</td>
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<tr>
<td>Program</td>
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Scope and Goal 1/2

• Goal Understanding of basic principles and concepts and their application to practical use.
• Content
  – Basic principles and concepts
  – Modeling Language (UML) and Programming Languages (Java)
  – Object-oriented Software Development Method (Unified Process)
  – Software Patterns (Analysis Patterns, Architectural Patterns, Design Patterns, Idioms, Process Patterns)

Scope and Goal 2/2

• History and Views
  – Technical merits of object oriented approach
  – Achievement (information hiding, abstract data type, inheritance)
  – Current topics (Design patterns, Application framework, software architecture, middleware)
• $BTF4UVEJFT$
  – Matched Parenthesis
  – Dining Philosophers
  – Elevator Control System

Important Concepts to be studied

• Class and Instance (J.J. Dahl SIMULA67, 1967)
  – Removal of redundant description
• Information hiding (D.L. Parnas)
  – Easiness of modifying a data structure
• Abstract Datatype
  – Both
• Inheritance
  – Reuse of classes by subclassing
  – Easiness of extension of functions by subtyping
• Polymorphism
  – Dynamic binding
• Use of the same concepts through analysis, design and programming
  – Simple correspondence among software artifacts
1967: Simula by O.J. Dahl  
1972: Parnas Module by D.Parnas  
1972: Smalltalk72(Xerox PARC)  
1977: CLU by B. Liskov  
1981: Smalltalk80 by Xerox  
1986: Objective-C by Cox, C++ by Strusup


1988: Eiffel by B. Meyer  
1989: CLOS by Moon  
Now: Java

• Hassan Gomaa, Designing Concurrent, Distributed And Real-Time Application with UML, Addison-Wesley, (2000).

• Frank Buschmann, Regine Meunier, Hans Rohrert, Peter Sommerlad, Michael Stal, "Pattern-Oriented Software Architecture — A System of Patterns" John Wiley & Sons, 1996