KLE TECH.

KLE Technological University

Creating Value
Leveraging Knowledge

Object Oriented Programming with C++ (20ECSC204)

SCHOOL OF COMPUTER SCIENCE AND ENGINEERING

Course Teachers:

Prof. KMM Rajashekhariah
Prof. Manas Panda
Prof. M K Gonal
Prof. Mahesh S Patil
Prof. Somashekhar Patil
Prof. Kavitha HS

Course Outcomes (COs)

At the end of the course the student should be able to:

1. Explain Object Oriented Programming concepts.
2. Apply Object Oriented concepts to solve a given problem.
3. Apply templates, standard template library to solve a given problem
4. Design solution for a given problem with design patterns.

Evaluation Scheme

Assessment	Weightage in Marks
Minor Exam-1	20
Minor Exam-2	20
Activity(Design)	10*
Total	**50**

Content

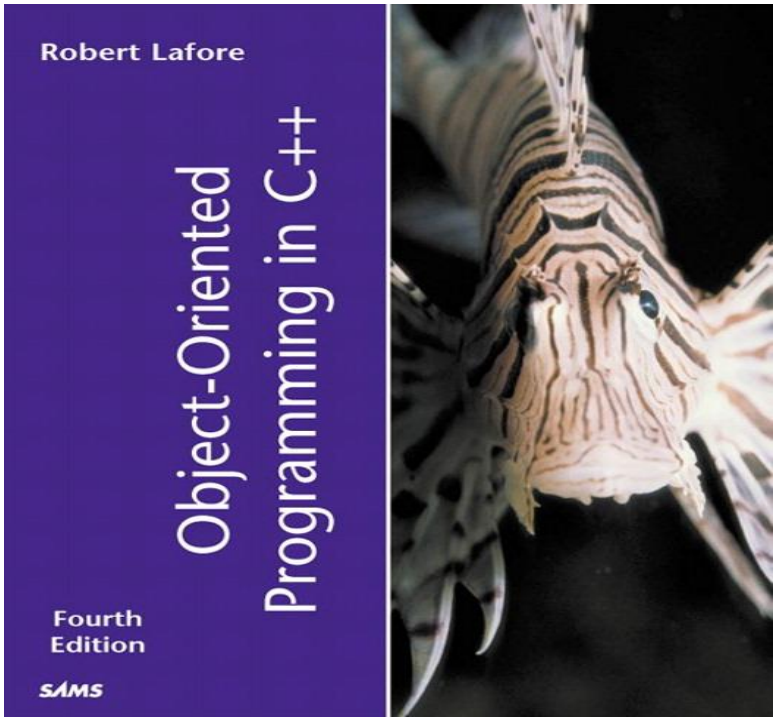
Unit – 1	
Chapter No. 1: Introduction to Object Oriented Programming: Introduction, characteristics of object oriented languages, Programming Basics, arrays, Functions in C++ (parameter passing techniques.)	4 Hrs
Chapter No. 2: Classes and Objects: Introduction to Classes and Objects, encapsulation visibility modifiers, constructor and its types, nested classes, String class. UML diagrams to describe classes and relationships.	6 Hrs
Chapter No. 3: Inheritance: Introduction, types of Inheritance, constructors, Abstract class, Aggregation: classes within classes	6 Hrs

Content

Unit – 2	
Chapter No. 4: Virtual Functions and Polymorphism: Virtual functions, Friend functions, static functions, The ‘this’ pointer	6 Hrs
Chapter No. 5: Exception Handling: Introduction to exceptions, Throwing an Exception, Try Block, Exception Handler (Catching an Exception), Multiple exceptions. Exceptions with arguments. Built-in exception class hierarchy.	6 Hrs
Chapter No. 6: Templates: Operator overloading, Function and class templates	4 Hrs
Unit – 3	
Chapter No. 7: Design Patterns:Creational, Structural and Behavioural design patterns.	4 Hrs
Chapter No. 8: Standard Template Library: container classes: Sequence and Associative Containers	4 Hrs

Text Book

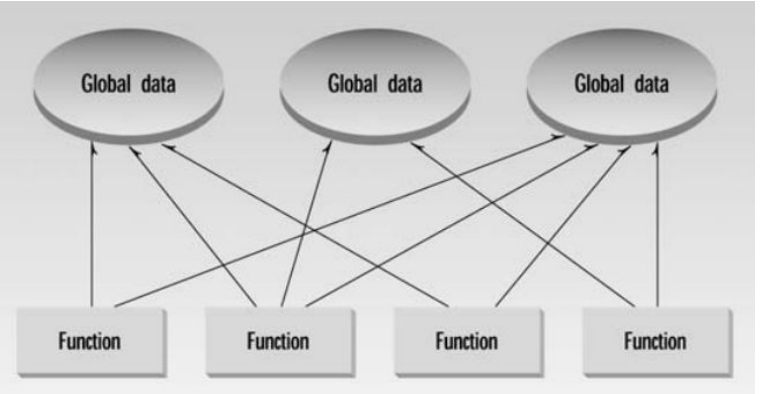
- OBJECT ORIENTED PROGRAMMING IN C++ by Robert Lafore, PEARSON, 4th Edition, (2013)



Introduction to Object Oriented Programming

Why Do We Need Object-Oriented Programming?

- What is Procedural Languages?
- Division into Functions and modules
- Problems with Structured Programming
  - Unrestricted Access
  - it makes a program's structure difficult to conceptualize
  - it makes the program difficult to modify



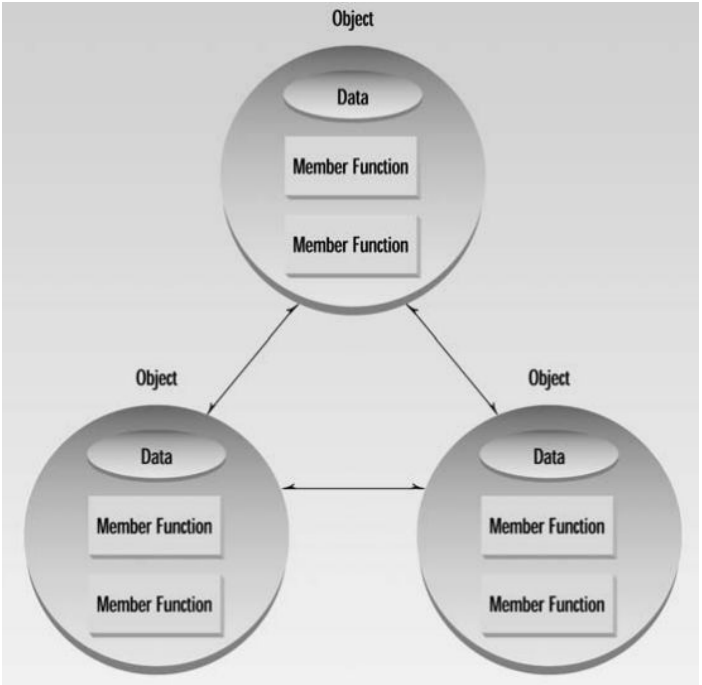
Why Do We Need Object-Oriented Programming?

Real-World Modeling

- separate data and functions does a poor job of modeling things
- Complex real-world objects have both attributes and behavior
  - Attributes
  - Behavior

The Object-Oriented Approach

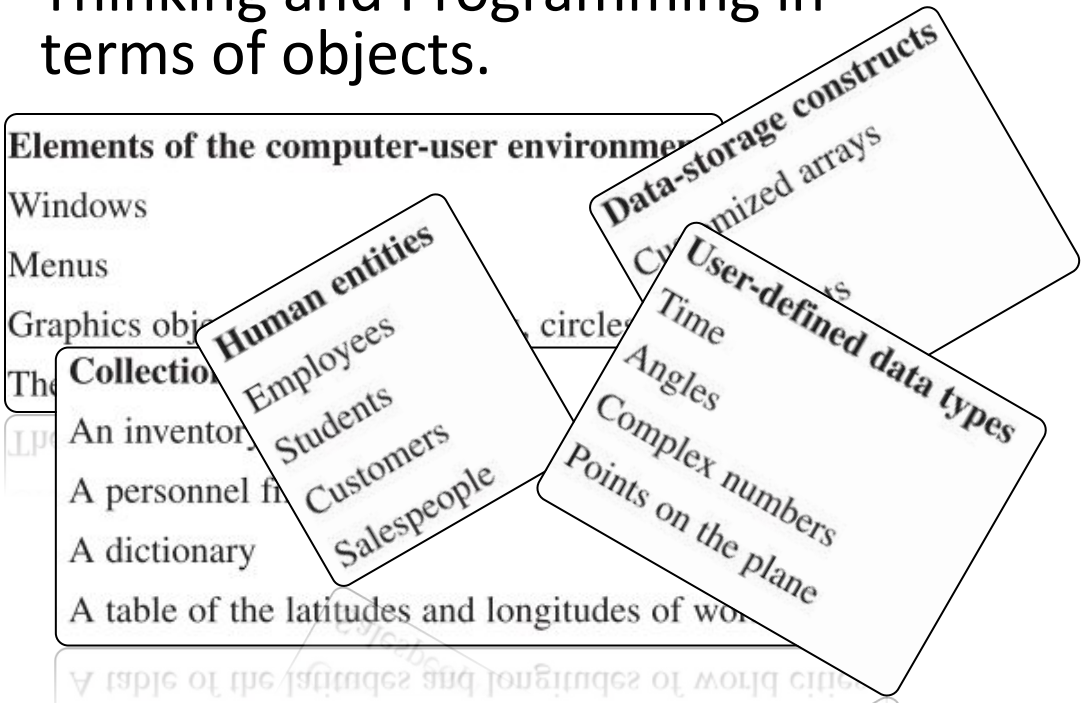
- Fundamental: single unit both data and the functions that operate on that data
- data is hidden, so it is safe from accidental alteration

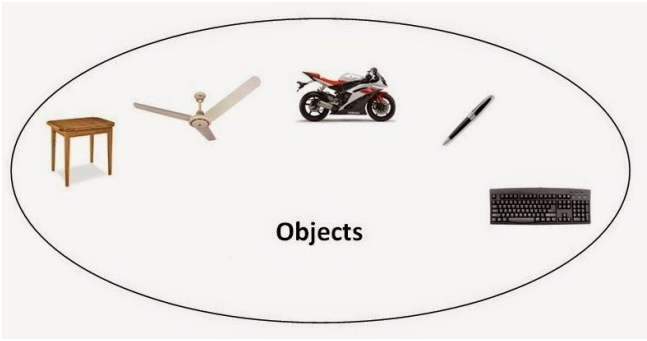


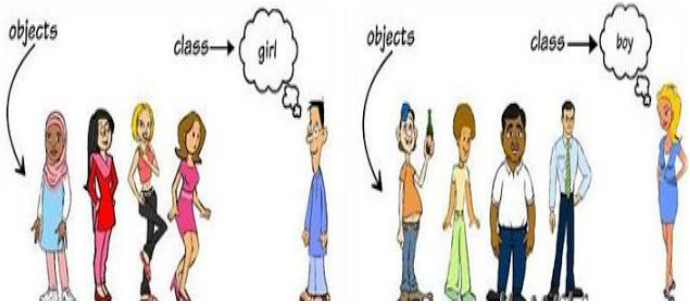
Characteristics of Object-Oriented Languages

Objects and Classes

Thinking and Programming in terms of objects.

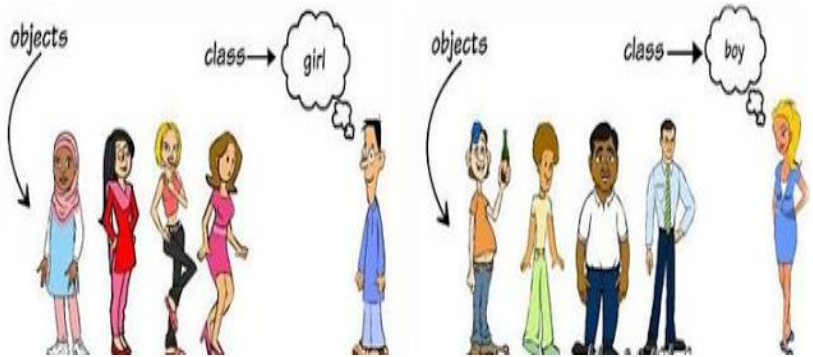


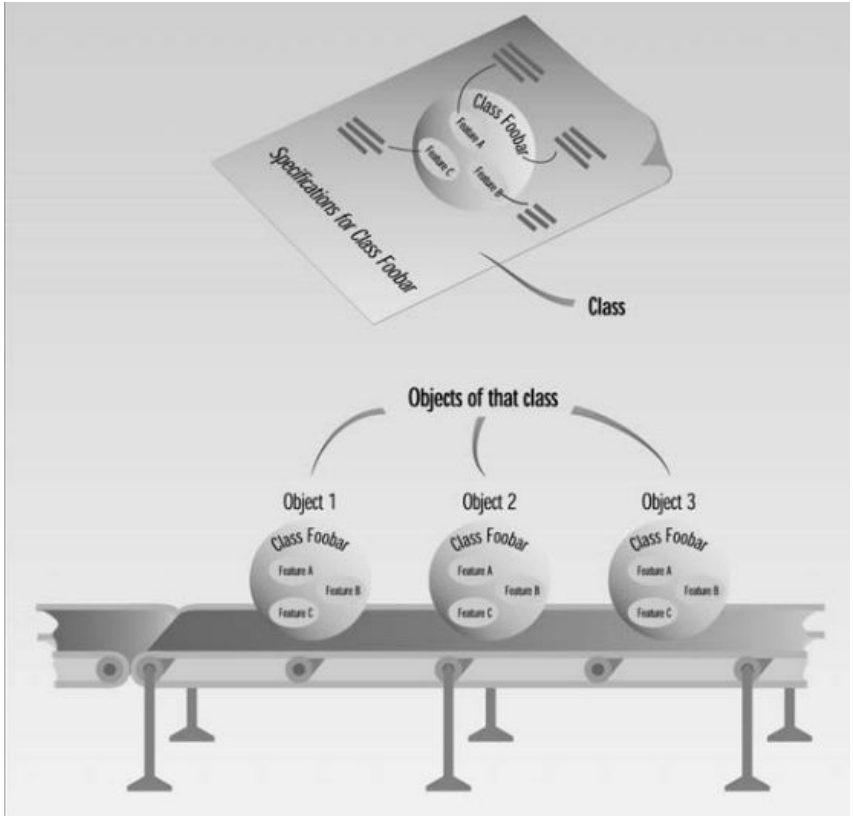




Characteristics of Object-Oriented Languages

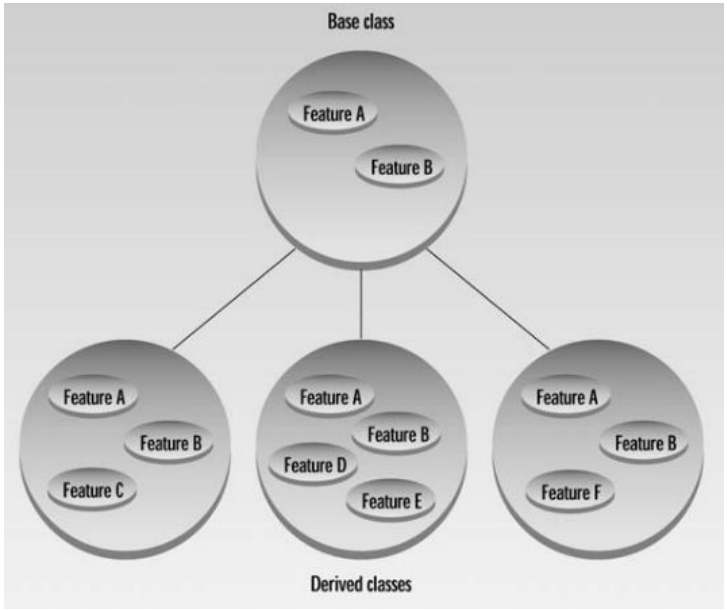
Classes





Characteristics of Object-Oriented Languages

Inheritance and Reusability



Characteristics of Object-Oriented Languages

- Polymorphism and Overloading

One thing and many forms