Fakultas Informatika
School of Computing
Telkom University

CII3B4
Pemrograman Berorientasi Objek

Introduction to OOP

Syllabus

- Introduction to OOP
- Class and Object
- Encapsulation
- Class Relationship
- Inheritance
- Abstract Class and Interface
- Polymorphism
- Static and Collection
- Exception
- MVC Architecture
- GUI
- JDBC
- OO in other programming language

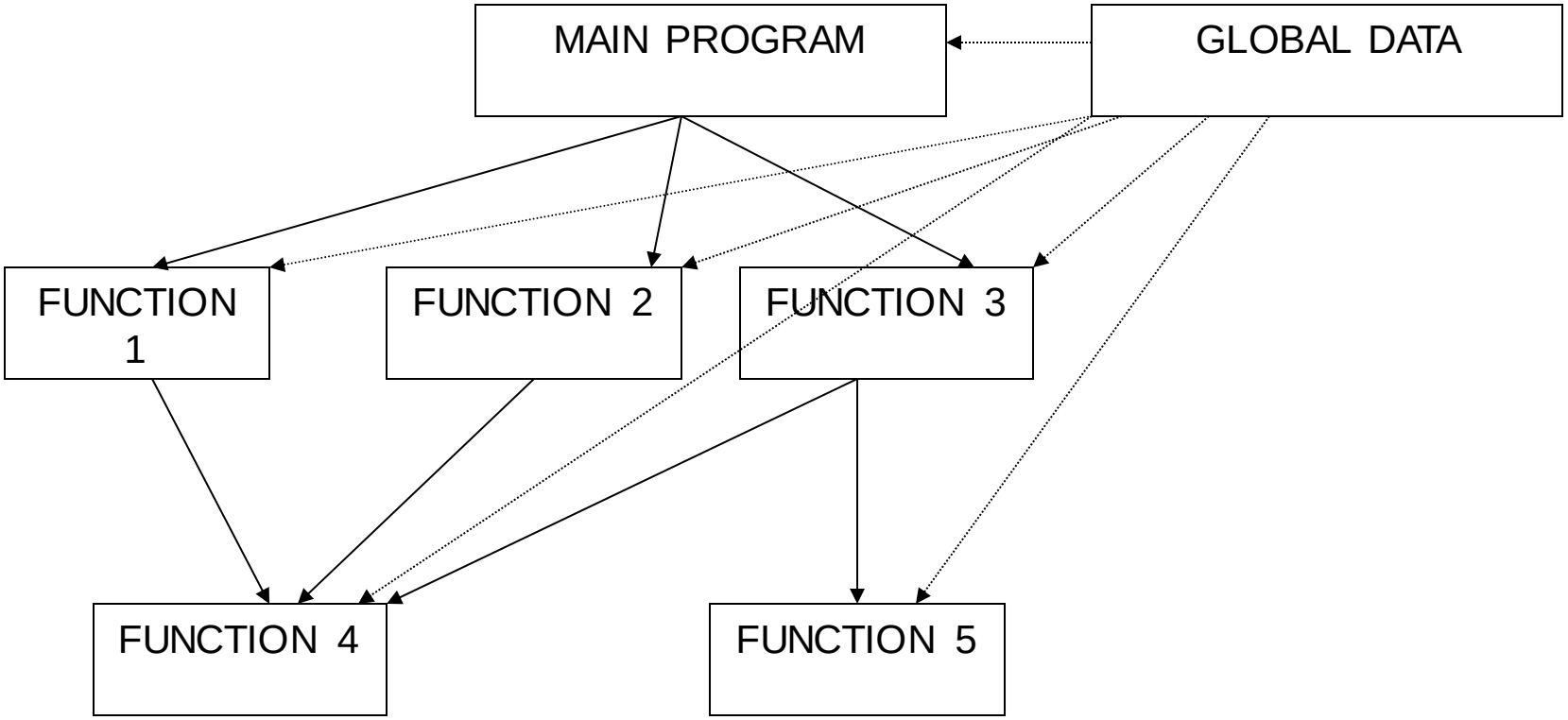
Grading Component

- Practicum per Week (12x) start at 2nd week (1st is runmod): 24,5%
- Quiz / Assignment @ LMS: 21,5%
- Project Presentation / UTS: 21%
- Project Application: 33%

Introduction to OOP

- Difference between structural programming and OOP
- Basic terminology in OOP
- The advantage and disadvantage of OOP
- Four design principles of OOP

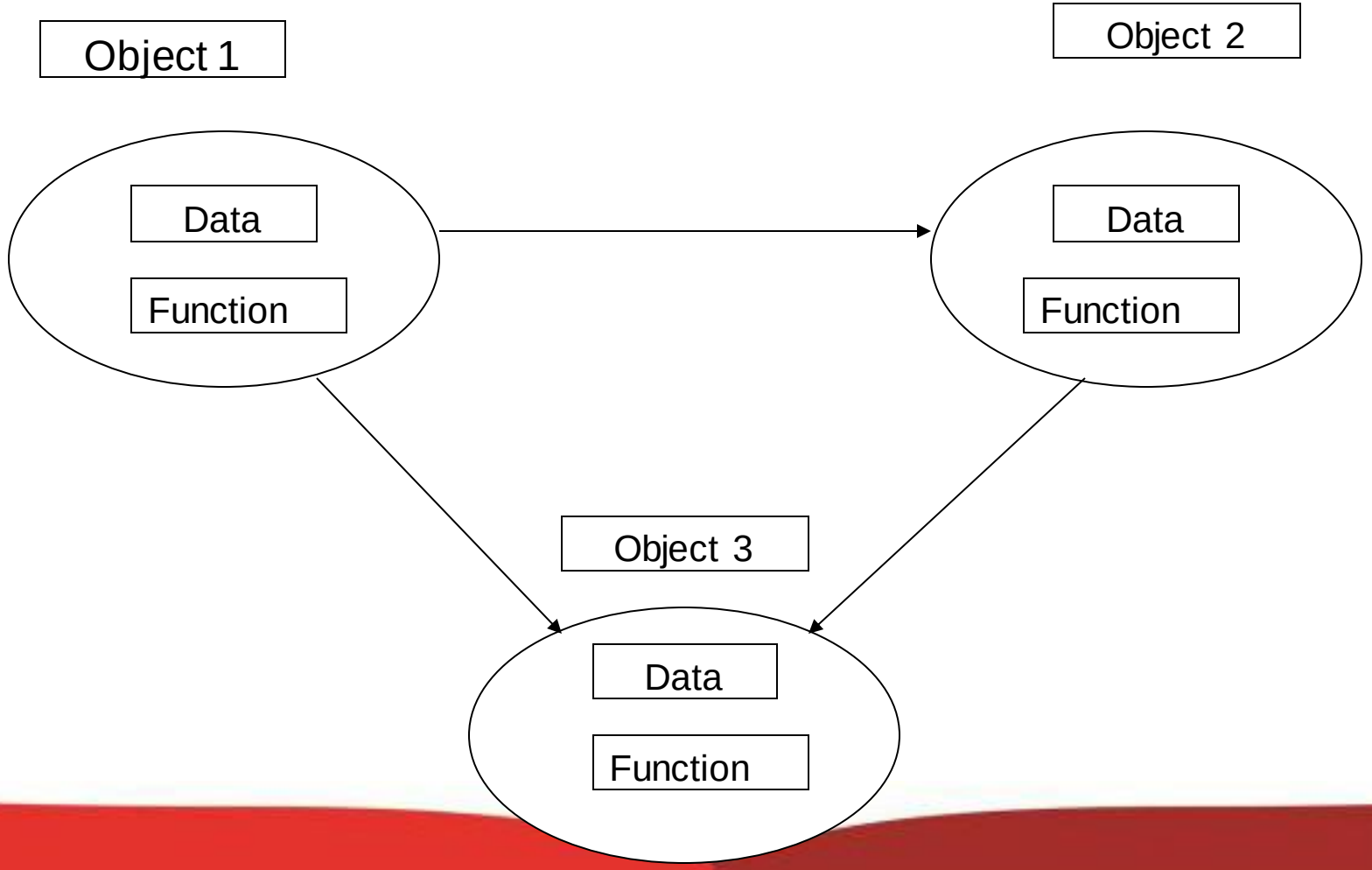
Structured Programming



Structured Programming

- Using function
- Function & program is divided into modules
- Every module has its own data and function which can be called by other modules

Object Oriented Programming



OOP

- Objects have both data and methods
- Objects of the same class have the same data elements and methods
- Objects send and receive messages to invoke actions
- The real world can be accurately described as a collection of objects that interact.

Basic Terminology in OOP

- Object: a real world entity such as pen, laptop, car, bed, keyboard, mouse, chair, transaction, user
- Class: a group or type of similar objects
- Method: what an object can do
  - A car can turn right, turn left, stop, etc
- Attribute: what an object can have
  - A student can have name, id, grade, etc

The Advantage of OOP

- ***Code Reuse and Recycling***: Objects created for Object Oriented Programs can easily be reused in other programs.
- ***Abstraction***: Once an Object is created, knowledge of its implementation is not necessary for its use.
- ***Data Hiding***: Objects have the ability to hide certain parts of themselves from programmers. This prevents programmers from tampering with values they shouldn't.

The Advantage of OOP (Cont)

- ***Design Benefits***: Object Oriented Programs force designers to go through an extensive planning phase, which makes for better designs with less flaws.
- ***Software Maintenance:*** An Object Oriented Program is much easier to modify and maintain than a non-Object Oriented Program.

The Disadvantage of OOP

- ***Size***: Object Oriented programs are much larger than other programs.
- ***Effort***: Object Oriented programs require a lot of work to create.
- ***Speed***: Object Oriented programs are slower than other programs, partially because of their size. Also, OOP demand more system resources, thus slowing the program down.

Design Principle of OOP

- Abstraction
- Encapsulation
- Inheritance
- Polymorphism

Abstraction

- Focus only on the important facts about the problem at hand to design, produce, and describe so that it can be easily used without knowing the details of how it works.

Analogy:

- When you drive a car, you don't have to know how the gasoline and air are mixed and ignited.
- Instead you only have to know how to use the controls.

Encapsulation

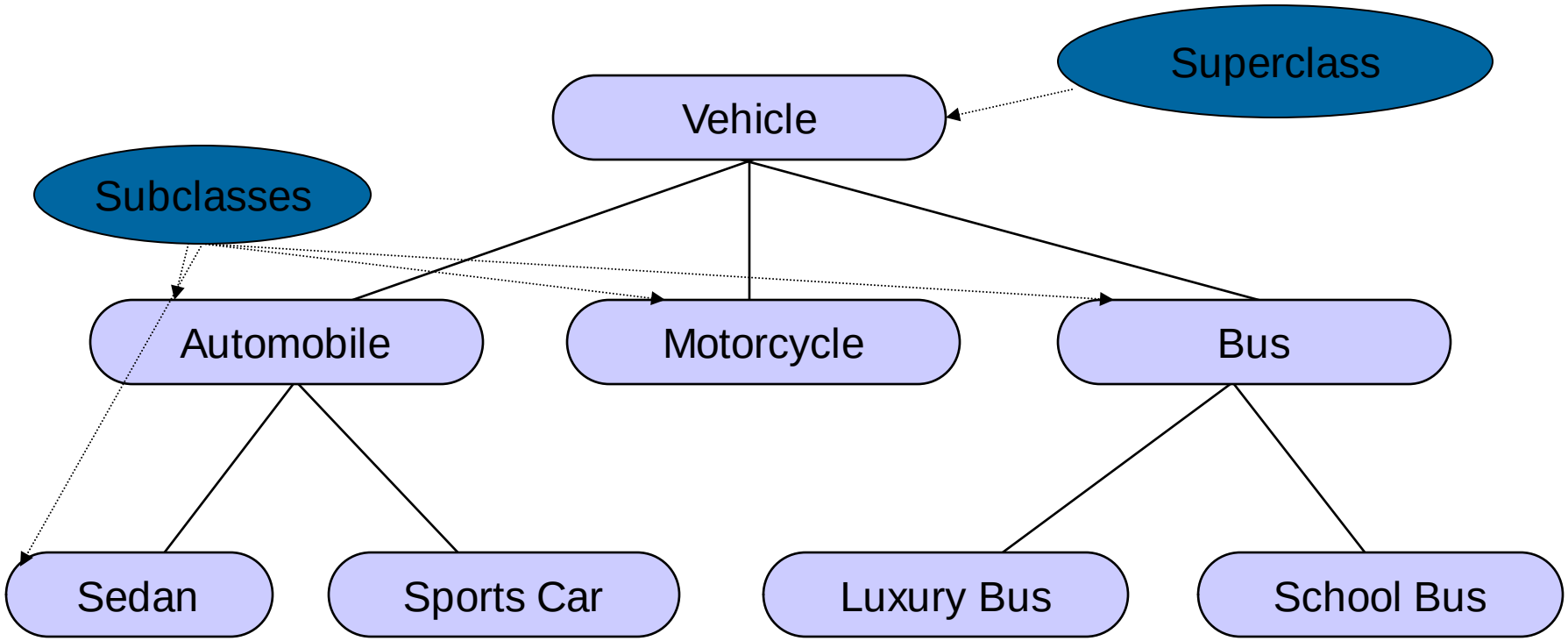
- Also known as data hiding
- Only object's methods can modify information in the object.

Analogy:

- ATM machine can only update accounts of one person or object only.

Inheritance

- A way of organizing classes
- Classes with properties in common can be grouped so that their common properties are only defined once.
- Superclass – inherit its attributes & methods to the subclass(es).
- Subclass – can inherit all its superclass attributes & methods besides having its own unique attributes & methods.


Superclass
Vehicle
Subclasses
Automobile
Motorcycle
Bus
Sedan
Sports Car
Luxury Bus
School Bus

Polymorphism

- the same object or behaviour can have more than one interpretation in different context
- Example:
  - A shape can be a triangle, a square or a circle
  - How every creature move is different. Fish move by swimming, bird move by flying, etc

Question?

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THANK YOU