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FACULTY OF ENGINEERING & TECHNOLOGY

BCS-503: Object Oriented Techniques

Lecturer-14

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OBJECTIVES

In this PPT, you will learn to:

- ❖Object Oriented Design
- ❖System Design
- ❖Object Design
- ❖Object Identification

OBJECT ORIENTED DESIGN

In object-oriented design, the technology-independent concepts in the analysis model are mapped onto implementing classes, constraints are identified, and interfaces are designed, resulting in a model for the solution domain.

The stages for object–oriented design can be identified as −

- Definition of the context of the system
- Designing system architecture
- Identification of the objects in the system
- Construction of design models
- Specification of object interfaces

SYSTEM DESIGN

Object-oriented system design involves defining the context of a system followed by designing the architecture of the system.

Context

- The context of a system has a static and a dynamic part.

- The static context of the system is designed using a simple block diagram of the whole system which is expanded into a hierarchy of subsystems.

- The subsystem model is represented by UML packages.

- The dynamic context describes how the system interacts with its environment.

- It is modelled using use case diagrams.

System Architecture

- The system architecture is designed on the basis of the context of the system in accordance with the principles of architectural design as well as domain knowledge.

- Typically, a system is partitioned into layers and each layer is decomposed to form the subsystems.

OBJECT DESIGN

The objects identified during analysis are etched out for implementation with an aim to minimize execution time, memory consumption, and overall cost.

Object design includes the following phases −

- Object identification
- Object representation, i.e., construction of design models
- Classification of operations
- Algorithm design
- Design of relationships
- Implementation of control for external interactions
- Package classes and associations into modules

OBJECT IDENTIFICATION

The first step of object design is object identification. The objects identified in the object–oriented analysis phases are grouped into classes and refined so that they are suitable for actual implementation.

The functions of this stage are −

- Identifying and refining the classes in each subsystem or package
- Defining the links and associations between the classes
- Designing the hierarchical associations among the classes, i.e., the generalization/specialization and inheritances
- Designing aggregations

REFERENCES

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Multiple Choice Question:

Q1. Which was the first purely object oriented programming language developed?

a) Java

b) C++

c) SmallTalk

d) Kotlin

Multiple Choice Question:

Q2. Who invented OOP?

a) Alan Kay

b) Andrea Ferro

c) Dennis Ritchie

d) Adele Goldberg

Multiple Choice Question:

Q3. What is the additional feature in classes that was not in structures?

a) Data members

b) Member functions

c) Static data allowed

d) Public access specifier

Multiple Choice Question:

Q4. Which is not feature of OOP in general definitions?

a) Code reusability

b) Modularity

c) Duplicate/Redundant data

d) Efficient Code

Multiple Choice Question:

Q5. Which language does not support all 4 types of inheritance?

a) C++

b) Java

c) Kotlin

d) Small Talk

Summary

In this PPT, you learned that:

- After the analysis phase, the conceptual model is developed further into an object-oriented model using object-oriented design (OOD)
- The context of a system has a static and a dynamic part