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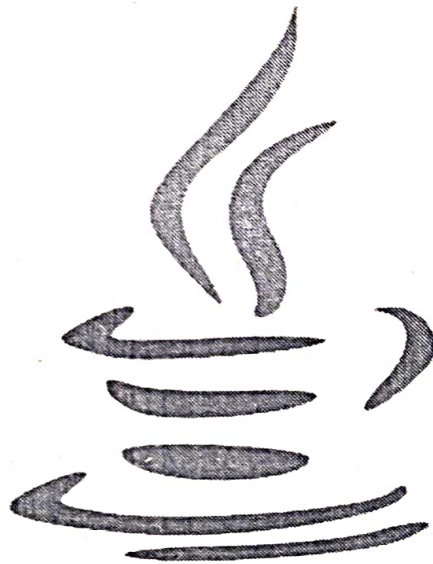
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Object Oriented Programming Using JAVA



Cheekatimarla Anil Kumar

OBJECT ORIENTED PROGRAMMING USING JAVA



Cheekatimarla Anil Kumar

Lecturer in Computer Science

V.S.R. Govt. Degree & P.G. College

Movva – 521135, Krishna District. A.P.

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ACKNOWLEDGEMENTS

The book comes into existence due to my observation of lack of support material of undergraduate students. It is published with the belief that it will help the UG (CBCS) Second Year – Third semester B.Sc. Computer Science / Information Technology students to the maximum extent.

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Chapter - 1

FUNDAMENTALS OF OBJECT ORIENTED PROGRAMMING

1.1. Object oriented paradigm:

“Paradigm” means “a model of something”. The Object-Oriented Paradigm is a way of looking at this Object-Oriented Programming model. This model is based on “objects” only.

It is a programming paradigm based upon objects (having both data and methods) that aims to incorporate the advantages of modularity and reusability. Objects, which are usually instances of classes, are used to interact with one another to design applications and computer programs.

The important features of object-oriented programming are:

- Bottom-up approach in program design.
- Programs organized around objects, grouped in classes.
- Focus on data with methods to operate upon object's data.
- Interaction between objects through functions.
- Reusability (Inheritance) of design through creation of new classes by adding features to existing classes.

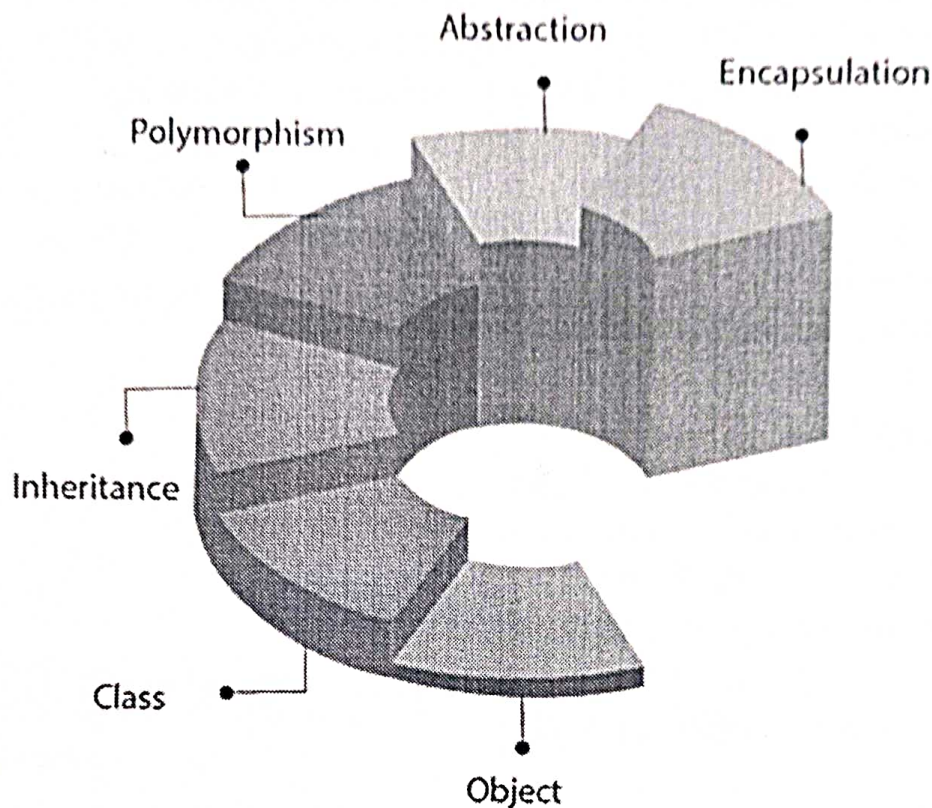
Examples of object-oriented programming languages: C++, Java, C#, Perl, Python, Ruby, and PHP.

1.2. Basic Concepts of Object oriented programming:

Object means a real-world entity such as a pen, chair, table, computer, watch, etc. Object-Oriented Programming is a methodology or paradigm to design a program using classes and objects. It simplifies the software development and maintenance by providing some concepts:

- Object
- Class

- Inheritance
- Polymorphism
- Abstraction
- Encapsulation
- Dynamic binding
- Message communication



1. Object:

Any entity that has state and behavior is known as an object. For example a chair, pen, table, keyboard, bike, etc. It can be physical or logical.

An Object can be defined as an instance of a class. An object contains an address and takes up some space in memory. Objects can communicate without knowing the details of each other's data or code. The only necessary thing is the type of message accepted and the type of response returned by the objects.

Example: A dog is an object because it has states like color, name, breed, etc. as well as behaviors like wagging the tail, barking, eating, etc.

2. Class:

Collection of objects is called class. It is a logical entity. A class can also be defined as a blueprint from which you can create an individual object. Class doesn't consume any space.

3. Inheritance:

When one object acquires all the properties and behaviors of a parent object, it is known as inheritance. It provides code reusability. It is used to achieve runtime polymorphism.

Considering HumanBeing a class, which has properties like hands, legs, eyes, mouth, etc. and functions like walk, talk, eat, see etc. Man and Woman are also classes, but most of the properties and functions are included in HumanBeing. Hence, they can inherit everything from class HumanBeing using the concept of Inheritance.

4. Polymorphism:

If one task is performed by different ways, it is known as polymorphism. For example, shape, triangle, rectangle, etc. Another example can be to speak something; for example, a cat speaks meow, dog barks woof, etc.

In Java, we use method overloading and method overriding to achieve polymorphism.

5. Abstraction:

Hiding internal details and showing functionality is known as abstraction. For example phone call, we don't know the internal processing. In Java, we use abstract class and interface to achieve abstraction.

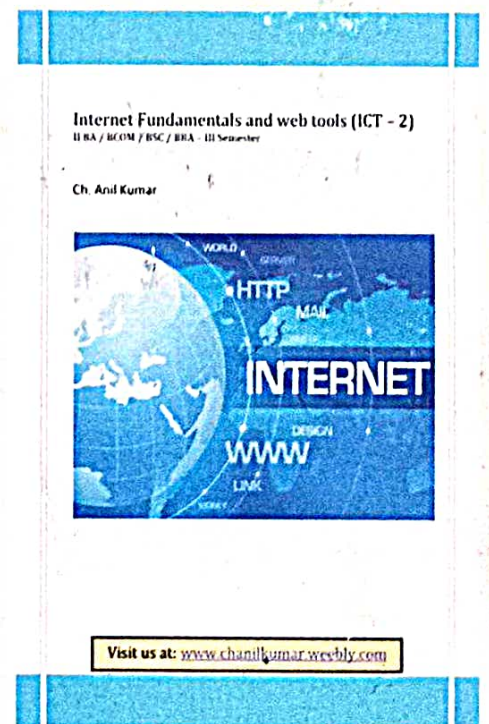
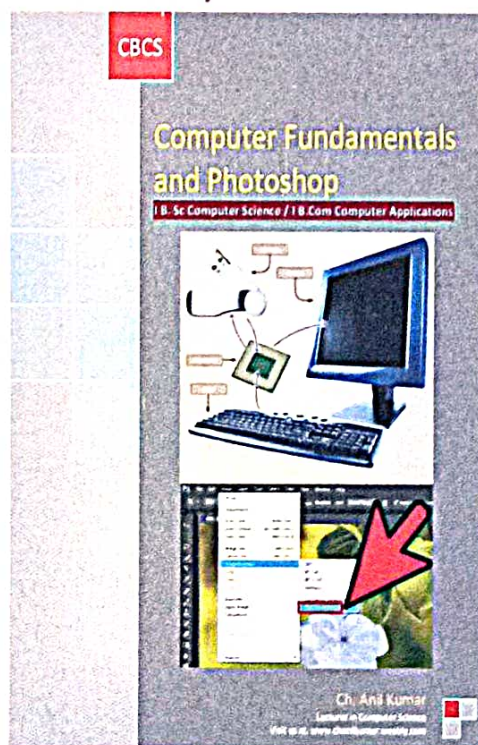
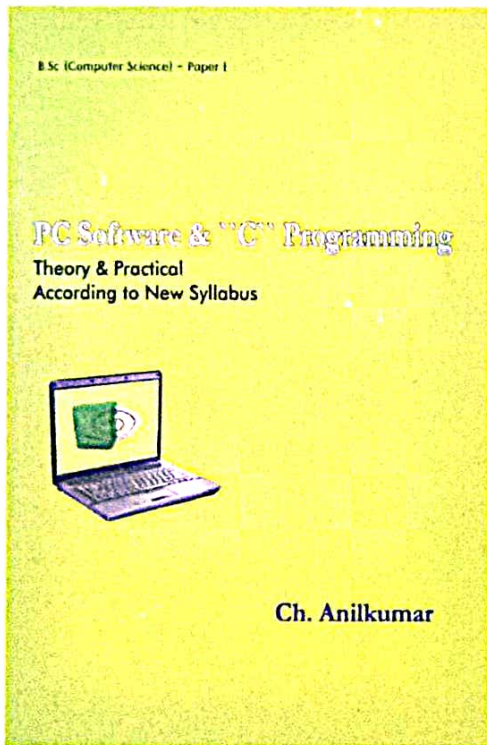
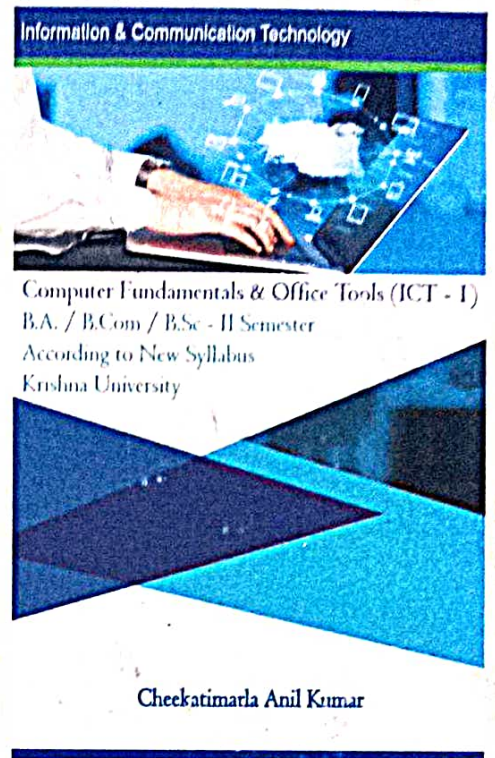
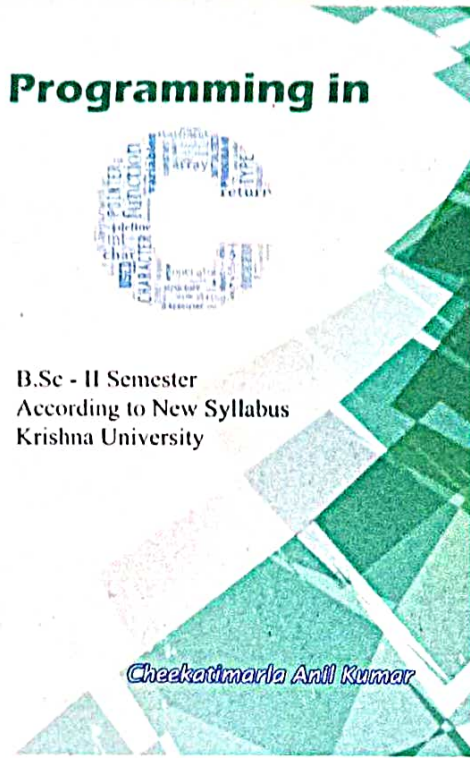
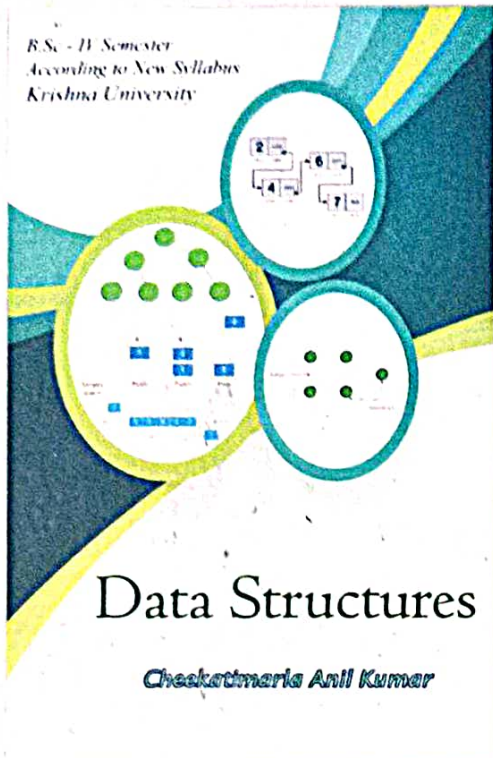
6. Encapsulation

Binding (or wrapping) code and data together into a single unit are known as encapsulation. For example capsule, it is wrapped with different medicines.

7. Dynamic binding:

Dynamic binding refers to the linking of a procedure call to the code to be executed in response to the call. Dynamic binding

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