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Cheekatimarla Anil Kumar

DATABASE MANAGEMENT SYSTEM

ISBN: 978-93-5593-685-1

First Edition 2021

Price ₹ 100/-

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Chapter 1 – Overview of Database Management System

1.1. Data Vs Information:

The words Data and Information may look similar and many people use these words very frequently, but both have lots of differences between them.

Data: Data usually refers to raw data or unprocessed data. It is the basic form of data, data that hasn't been analyzed or processed in any manner. Once the data is analyzed, it is considered as information.

Information: Information is a set of data which is processed in a meaningful way according to the given requirement. Information is processed, structured, or presented in a given context to make it meaningful and useful.

Difference between Data & Information:

Data	Information
Data is used as input for the computer system.	Information is the output of data.
Data is unprocessed facts figures.	Information is processed data.
Data doesn't depend on Information.	Information depends on data.
Data is not specific.	Information is specific.
Data is a single unit.	A group of data which carries news and meaning is called Information.
Data doesn't carry meaning.	The information must carry a logical meaning.
Data is the raw material.	Information is the product.

1.2. Database:

A database is an organized collection of inter – related data, so that it can be easily accessed and managed. You can organize data into tables, rows, columns, and index it to make

it easier to find relevant information. The main purpose of the database is to operate a large amount of information by storing, retrieving, and managing data.

For example: The college Database organizes the data about the admin, staff, students and faculty etc.

1.3. Data Base Management System:

Data Base Management System provides an interface to perform various operations like database creation, storing data in it, updating data, creating a table in the database and a lot more. It provides protection and security to the database. In the case of multiple users, it also maintains data consistency.

Database management system is a software which is used to manage the database. For example: MySQL, Oracle, etc. are a very popular commercial database which is used in different applications.

1.4. File Based System:

When computers came, all these jobs become easy. But initial days, these records were stored in the form of files. The way we stored in files is similar to papers, in the form of flat files – to be simpler, in notepad. Yes, the informations where all in the notepads with each fields of information separated by space, tab comma, semicolon or any other symbol.

STUDENT_ID	STUDENT_NAME	STATE	AGE
101	MOKSHITH	A.P.	16
102	JESHWANTH	A.P.	14
103	MAHITH	A.P.	20
104	VINEETH	A.P.	18

All the files were grouped based on their categories; file used to have only related informations and each file is named properly. As we can see in the above sample file has Student information.

Now, if we want to see a specific Student detail from a file, what do we do? We know which file will have the data, we open that file and search for his details. Fine, here we see the files; we can open it and search for it. But imagine we want to display student details in a User Interface. Now how will we open a file, read or update it? There different programs like C, C++, COBOL etc. which helps to do this task. Using these programming languages, we can search for files, open them,

search for the data inside them, and go to specific line in the file, add/update/delete specific information.

1.5. Drawbacks of File Based System:

File Processing System was first to replace non-computer based approach for maintaining records. It was a successful System of its time and still there are many organizations that are using File Processing System to maintain their data and information. But it is just not suitable for handling data of big firms and organizations. It has many drawbacks and disadvantages that made it out of date.

1. Duplicate Data

Data is stored more than once in different files, that means duplicate data may occur in all these files. Since all the files are independent on each other so it is very difficult to overcome this error and if anyone finds this error then it will take time and effort to solve this issue.

For Example: A student is having record in college library and in Examination department. Then his name, roll number, fathers name and class will be same in both the departments. Also these departments are not dependent on each other. So it create lots of duplicates value about that student and when he needs any change for his name or class then he has to go to both the departments to make these changes happen otherwise it will create problem for him.

2. Inconsistency

In file processing system, various copies of same data may contain different values. Data is not consistent in this system, it means if a data item needs to be changed then all the files containing that data need to be modified. It may create a risk of out dated values of data.

For Example: If you change student name in library then his name should be changed in all the departments related to the student.

3. Accessing Anomalies

Accessing anomalies means that it is not easy to access data in a desired or efficient way. It makes supervision of department very difficult. If a user wants information in a specific manner then he requires creating a program for it.

For Example: Let's say , if admin of the college wants any student information like his name, fathers name, roll number, marks and class then program for it is written but if he wants records of whose students whose numbers are more than 80 percent then he require to create a different program for it.

4. Poor Data Integrity

A collection of data is integrated if it meets certain consistency constraints. A programmer always puts these constraints in the programs by adding some codes. In File Processing System, poor data integrity often arises and it becomes very difficult to add new constraints at that time. For Example: The maximum marks of the student can never be more than 100.

5. Poor Data Security

Poor data security is the most threatening problem in File Processing System. There is very less security in File Processing System as anyone can easily modify and change the data stored in the files. All the users must have some restriction of accessing data up to a level.

For Example: If a student can access his data in the college library then he can easily change books issued date. Also he can change his fine detains to zero.

6. Atomicity Problem

Atomicity Problem is required to save the data values, it means that information is completely entered or canceled at all. Any system may fail at any time and at that time it is desired that data should be in a consistent state.

For Example: If you are buying a ticket from railway and you are in the process of money transaction. Suddenly, your internet got disconnected then you may or may not have paid for the ticket. If you have paid then your ticket will be booked and if not then you will not be charged anything. That is called consistent state, means you have paid or not.

7. Wastage of Labor and Space

Labor is very costly in this era and no organization can afford wastage of their precious labor. File Processing System needs lots of copied data in different files that cause

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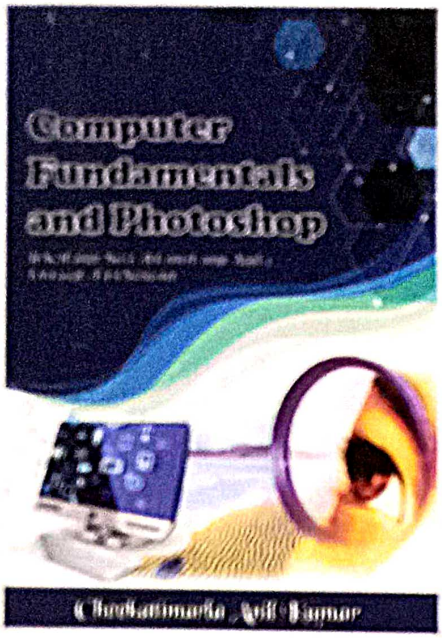

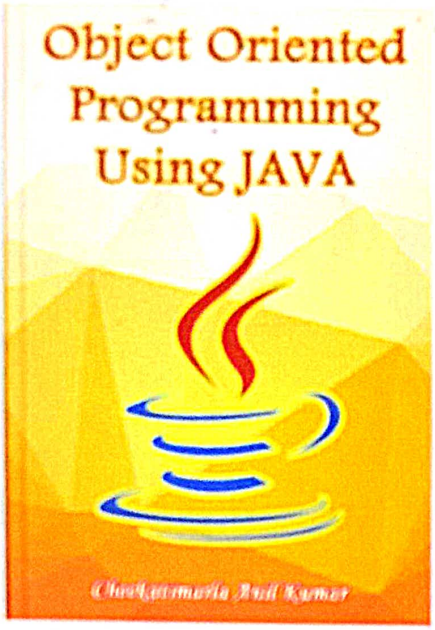

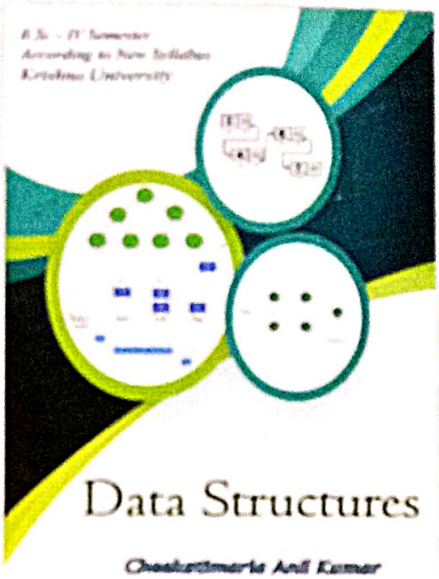

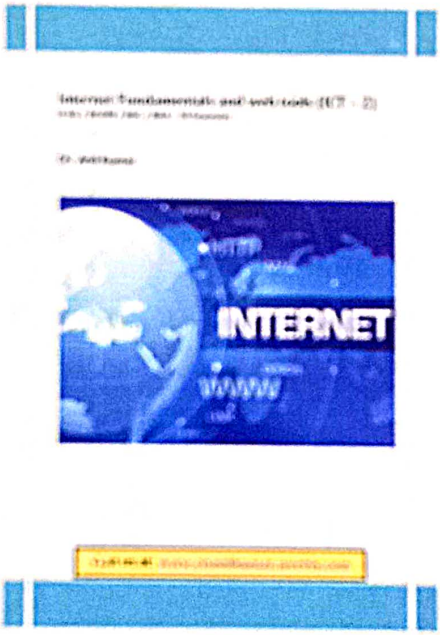

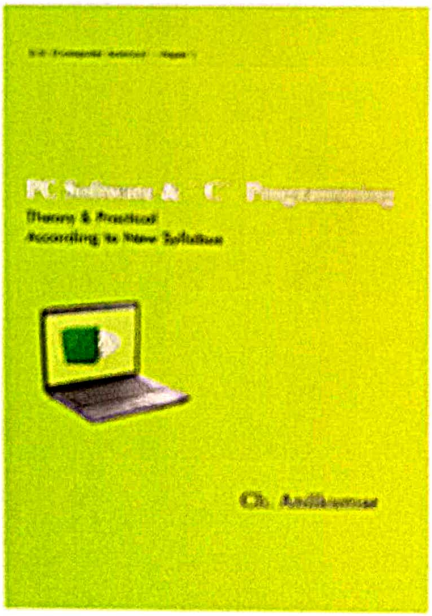

ISBN NO. 978-93-5393-685-1
Allotted by Raja Rammohun Roy National Agency for ISBN, Department of Higher Education, Ministry of Human Resource Development, Govt. of India

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