

MINI PROJECT  
(2020-2021)

**Alphazone: The Educational Web Application**

FINAL-TERM REPORT



**Institute of Engineering & Technology**

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Mathura – 281406

## **Declaration**

I hereby declare that the work which is being presented in the MINI PROJECT "**Alphazone:The Educational Web Application**", in fulfillment of the requirements for Project viva voce, is an authentic record of my own work carried under the supervision of MR. Neeraj Khanna ,Assistant professor.

**Signature of Candidate:**

A handwritten signature in blue ink, appearing to read "Aman".

**Name of Candidate: Aman Kushwaha**

**Roll. No. :181500075**

**Course:B.Tech CSE**

**Year:2020**

**Semester:5th**

## Certificate of Course:



Company Name: Internshala And Coursera

Course: Web Application Development Using Scripting technology

- 1.HTML5    2. CSS3    3.BOOTSTRAP 4    4. Java Script
- 5.Node Js    6.React Js    7. Next Js    8.Mongoo DB
- 9.Amazon AWS



## **ACKNOWLEDGEMENT**

First I express our heartiest thanks and gratefulness to almighty God for His divine blessing makes me possible to complete the third year project/training successfully.

We really grateful and wish our profound our indebtedness to ***Mr. Neeraj Khanna Assistant Professor, Department of CSE GLA University Mathura.*** His infinite patience, scholarly guidance, continual encouragement, constant and energetic supervision, constructive criticism, valuable advice, reading many inferior draft and correcting them at all stage have made it possible to complete this project documentation. Without this valuable support and guidance, this project could not elevate up to this level of development from my point of view.

I would like to express our heartiest gratitude, for his kind help to finish our project and also to other faculty member and the staff of CSE department of GLA University Mathura.

I would like to thank our entire course mate in GLA University, who took part in this discuss while completing the course work. Finally, I must acknowledge with due respect the constant support and patients of my parents

## **ABSTRACT**

**Alphazone : The Educational Web Application** is the main objective of this Mini Project. In This Project i have created a web Application for B.Tech CSE college going students. Here In this website Students can download handwritten notes of all subjects related to B.Tech CSE and more over Teachers can share the Zoom Recording on Alphazone portal. if any one have doubt related to these subject topic so they can watch different types of video related to each topic for better understanding. Generally Students faces the biggest problem in our country they can not afford the college due to heavy amount of fees but here i have provided them all CSE books, Videos ,Assignment as well as Hand written notes of Each Subject. technical aim of this project is to develop a web based application or software there are several programming languages that are in use. Some of them are used for the frontend and backend design of the software. For example HTML5, CSS, Bootstrap, React , Node, AWS Framework etc. There are also some other programming languages that were used to develop the dynamic functions of the software or application. I have developed web based application that is very useful for us because we can access it from anywhere of the world. It is very helpful for our daily life.

This report takes us through all the details of WEBSITE DESIGN AND DEVELOPMENT knowledge and experience gathered during this development period.

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# **1.General Introduction**

This website is developed for B.Tech Computer Science students in order to provide best educational hand written notes ,standard notes and video lecture series. Compared to the other old existing site a new database has been added to our project. This Website Uses Amazon web server (AWS) .Teachers can Upload the Zoom recording links on our portal.

## **1.1 Motivation:**

In desktop based website creating system is easy to understand. Since I accept training it seems to me I am advanced learner to learn web development, so it is easy and interested to learn and create. Further this project is related of student and I am introducing to its circumstances so it service technology is under of the understand mine. Its technology is so interested and charming and easy to build a project by fully HTML, CSS, MYSQL,Bootstrap, React JS,Node Js, Mongoo DB,Next JS,AWS.

## **1.2 OBJECTIVE:**

The objective of this web application is to to provide standard Books ,Handwritten Notes and Video Lecture Series of B.Tech CSE Subjects and Also student,teachers can share their assignment through this website. The system contains database where all the information will be stored safely.

### **1.2.1 To save the time and resources:**

If some time a student missed the class than there is a chance that he will skip that topic of that class and if somehow if he want to cover that topic from books it will take huge amount of time so here presence of handwritten notes student will save his huge amount of time. The website system will take less time in entering the data, processing it and getting its output. Fewer resources will be used as no large registers, files, ledgers, pens; correctors will be needed or used.

#### **1.2.2 To reduce the number of workers:**

After the system will be computerized only a single computer operator will be needed to operate the system while now more than one workers work in the system.

#### **1.2.3 To reduce the space being used:**

Every data will be stored in the computer memory whereas now it is stored in registers and files which then stored in bookshelves or cupboards and they need a large space.

#### **1.2.4 To reduce the work load:**

As the new system will be computerized, the database will be automatically updated at the time of entry. Everything will be done automatically just by clicking few buttons. There will be no need to maintain any files or registers.

#### **1.2.5 To make it easy to search any record:**

It will be much easier to find particular record rather than opening such huge files and finding a single record from them.

### **1.2.6 To edit records and update the database easily:**

Records will be easily edited and the database will easily be updated at the time of entering a record.

## **2. Software Requirement Analysis**

### **2.1 Define the Problem:**

The existing educational websites does not provides the all content related to subjects if they are providing than there is a chance that they all are not providing handwritten notes and video lectures at the same instance so here i am going to remove this disadvantage by providing all these facility. Alphozone uses amazon web server and in this website teachers from different-different universities can upload their zoom recording lectures in our portal.

### **2.2 Define the Modules and functionalities:**

#### **Front end Developer:**

The front end developer generally works at client side dealing with the web page design, graphics that is accessible to the user. Here in this Website i have provided user friendly GUI(Graphic User interface).

#### **Back end Developer:**

The back end person is responsible for the back end development that interacts with the server. In this Website This type of web developer specializes in the languages like React JS,Node JS, Mongoo DB, AWS. Here alphazone uses mongoose so admin or subscriber role can be changed any time ,any where so server side of this website runs smoothly.

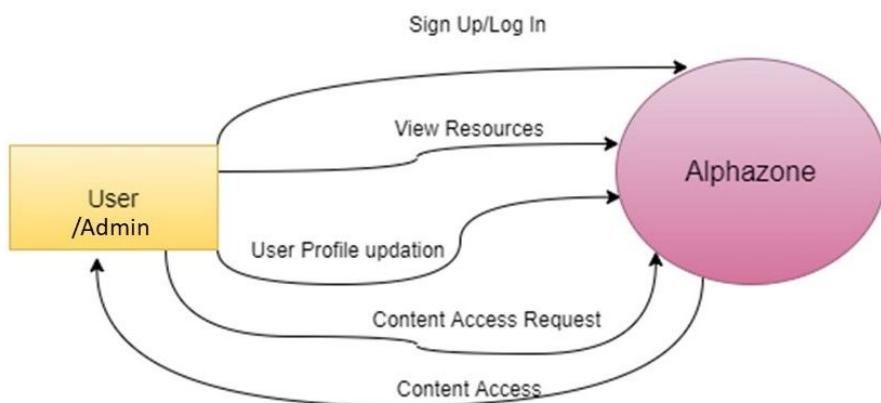
## **2.3. Implementation Detail**

- a). Home Page:** The first page provides several links. Users from different department can choose there department from the specific link available on home Page.
- b).Standard Book Section:** In this module User will find the all the Standard Books which are provided by the Website. This Module will be divided into three sub modules Soft Copy Section, Watch System and download section.
- c).Handwritten Notes Section:** In this module user will find every Handwritten Note related to there specific department and subject. This module will have all the handwritten notes of CS Department, ME department, Electrical Department, Electronics Department and civil department etc.
- d). Assignment Sharing:** In this section students can share their assignments to this website so that assignment will available for all other users.
- e).Study Room:**Here User will find their course notes according to their syllabus.Every Notes of every program will available in this page with module wise category. User can download these notes or they can study from these notes.

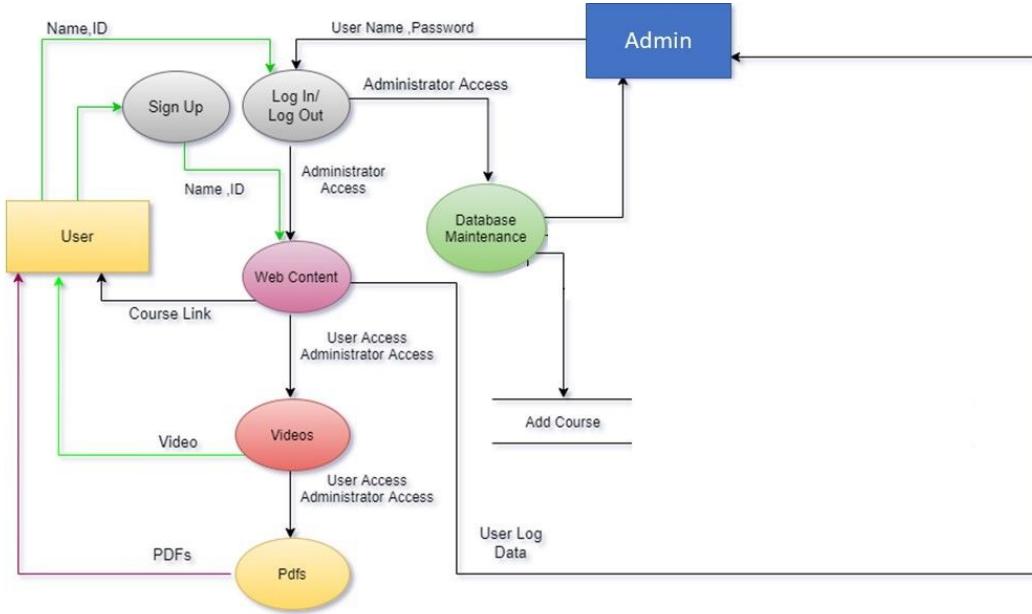
**f). Faculty Zone:** this module will available only for computer science and IT Sector teachers so they can upload their zoom recording on our portal.

### 3. Software Design

#### 3.1 Data Flow Diagram:



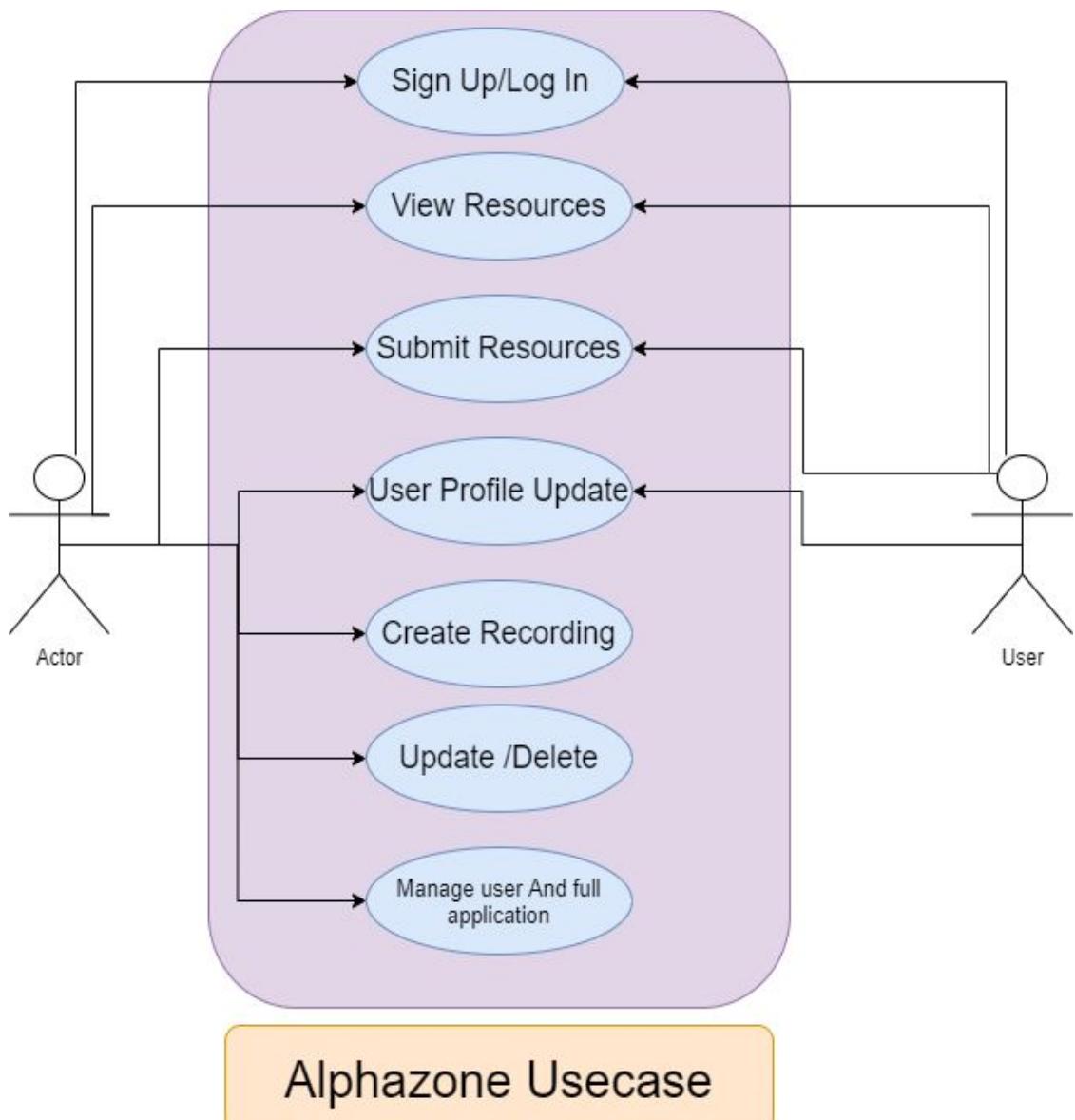
Alphazone : Zero Level DFD



Alphazone : 1st Level Data flow Diagram

### **3.2 UML Diagram:**

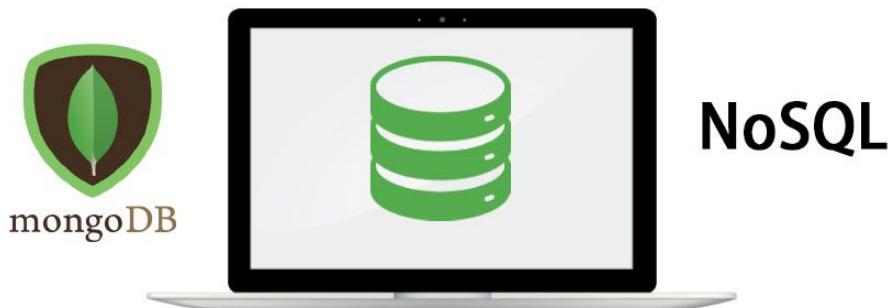
#### **3.2.1 Usecase Diagram**



### 3.3 ER Diagram:

Alphazone is using Mongoose atlas which is none sql(None Entity Relational) Database server so ER-Diagram is not Possible for this case.

# Is MongoDB NoSQL



## 4. Testing

Tests for correctness are supposed to verify that a program does exactly what it was designed to do. This is much more difficult than it may at first appear, especially for large programs. Tests for implementation efficiency attempt to find ways to make a correct program faster or use less storage. It is a code-refining process, which reexamines the implementation phase of algorithm development. Tests for computational complexity amount to an experimental analysis of the complexity of an algorithm or an experimental comparison of two or more algorithms, which solve the same problem.

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
A:\netbeans\Alphazone\public_html\Alphazone\client>npm run dev
> react-node-aws@1.0.0 dev A:\netbeans\Alphazone\public_html\Alphazone\client
> next

[ wait ]  starting the development server ...
[ info ]  waiting on http://localhost:3000 ...
Browserslist: caniuse-lite is outdated. Please run next command `npm update`
[ ready ]  compiled successfully - ready on http://localhost:3000
1: node, node
> nodemon server.js
[nodemon] 2.0.2
[nodemon] to restart at any time, enter `rs`
[nodemon] watching dir(s): ***!
[nodemon] watching extensions: js,mjs,json
[nodemon] starting `node server.js`
API is running on port 8000
DB connected
```

## 5.Implementation and User Interface:

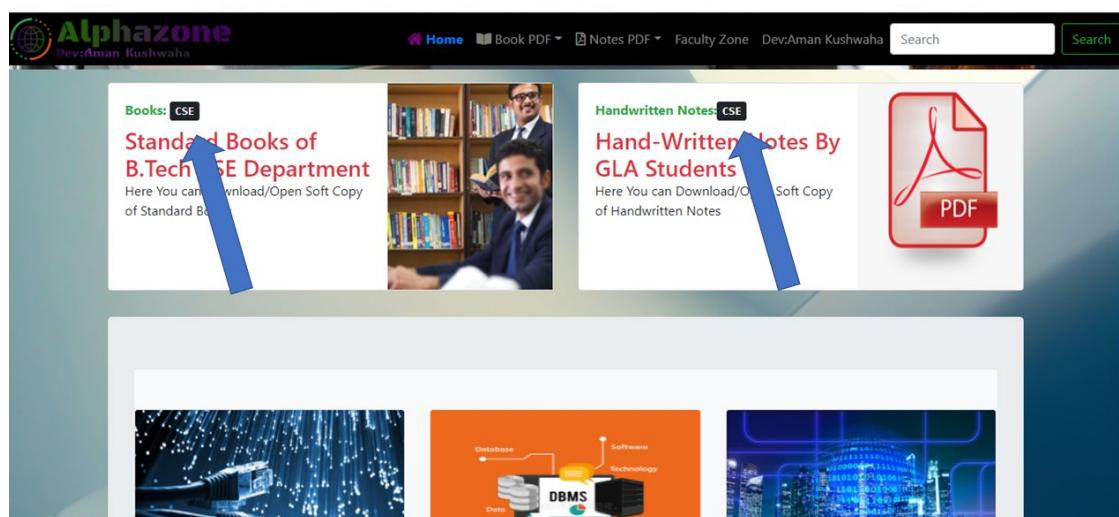
**Total Number of Web Pages of Alphazone =32**

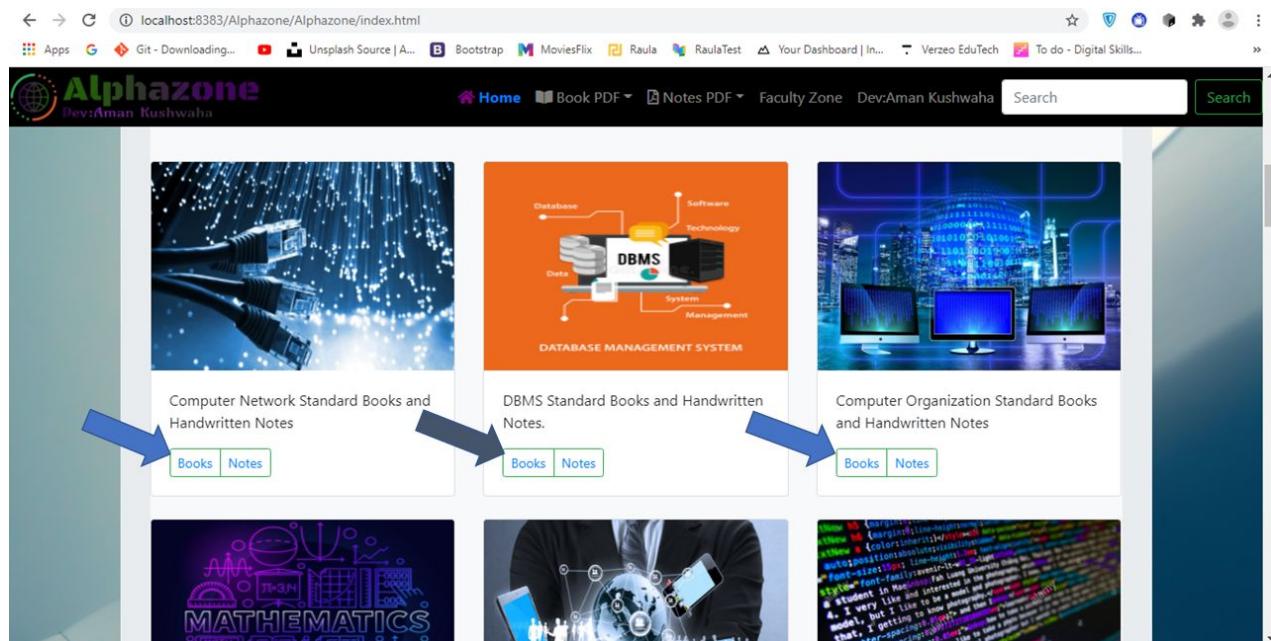
**a). Home Page:**

The home page of a website is the first page that a user perceives upon entering the website url at the browser address area. The entire website depends on how the home page is designed which forms the platform for viewing other web forms.

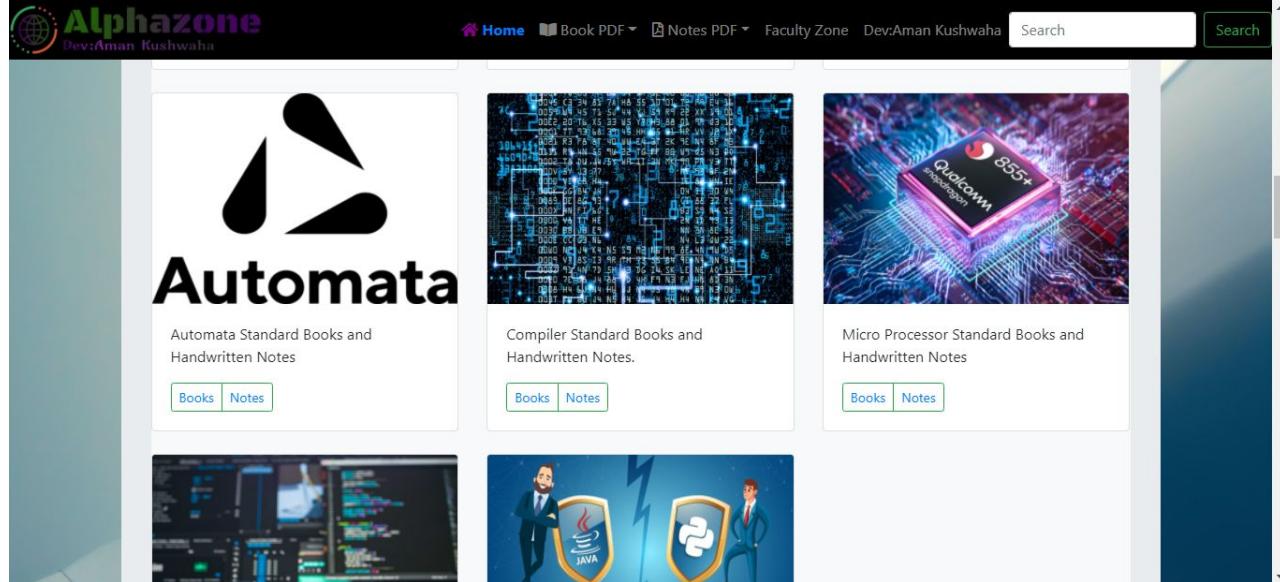


Homepage which Connects all the 32 other Webpages of This Website.





From the Home Page User Can Access the Books And Notes Either From Navigation Bar or Direct From HomePage.



Home Page Have Two types of link category

- a)Books Link.
- b)Notes Link.

localhost:8383/Alphazone/Alphazone/index.html

**Motive Of Alphazone ?**

**Recording Sharing via Amazon AWS**

Alphazone Provides the facility so that Teachers can share their zoom recorded lectures on our portal And Students can watch these lectures.

**Handwritten Notes For All Branches**

Alphazone uses Amazon AWS For Sharing the ZOOM Recording  
Mongo DB servers the category of user and Admin.

Study Room

Watch later Share

More videos

0:00 / 1:22

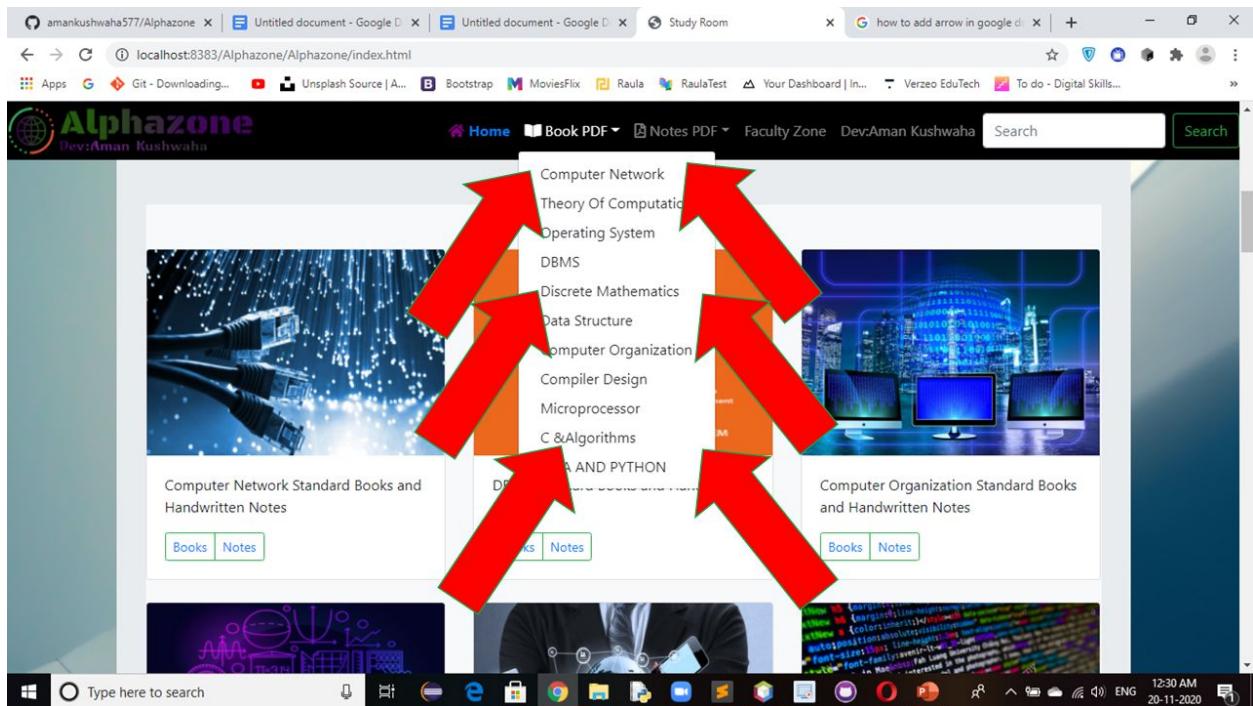
YouTube

[https://www.youtube.com/watch?v=viZd\\_4MLhIA&feature=emb\\_rel\\_pause](https://www.youtube.com/watch?v=viZd_4MLhIA&feature=emb_rel_pause)

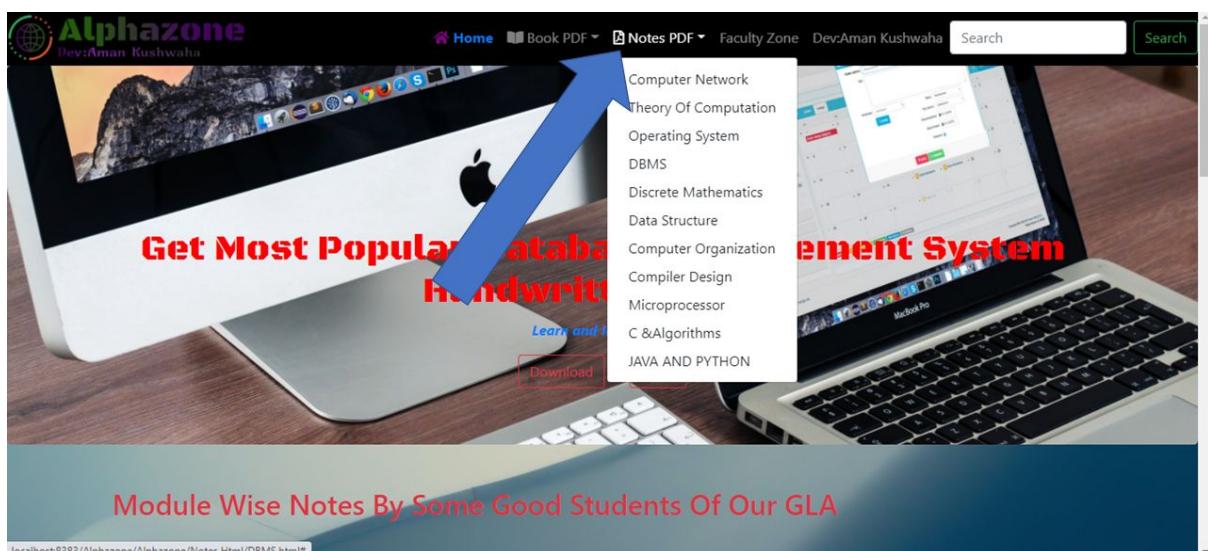
Homepage also have some Motivational Videos of Sandeep Maheshwari.

## b). MenuBar:

### Menubar for Books



### Menubar For Handwritten Notes



## C)Books:

The screenshot shows a web browser displaying the Alphazone website. The main content area features a banner with the text "Get Most Popular TAFL Books" and "Learn and Implement". Below the banner are two book entries. The first book is "Theory of Automata" by JEFFREY D. ULLMAN, with a "Download" button. The second book is also "Theory of Automata" by Tutorial Points, with a "Tutorial Points" logo and a "Download" button.

This screenshot shows a different section of the Alphazone website. It displays two book entries for "Theory of Automata". The left entry is for "Theory of Automata" by JEFFREY D. ULLMAN, with a "Download" button and a small image of a hand interacting with a digital interface. The right entry is for "Theory of Automata" by Tutorial Points, with a "Tutorial Points" logo and a "Download" button.

This screenshot shows a section titled "About These Books ?" on the Alphazone website. It features a book cover thumbnail for "AUTOMATA THEORY" by JEFFREY D. ULLMAN, which includes a lightbulb icon and the title. To the right of the thumbnail is a brief description of the prerequisites for the book, mentioning discrete mathematics, graphs, trees, logic, and proof techniques. Below this is another section titled "Tutorial Points" with a "Tutorial Points" logo and a copyright notice.

localhost:8383/Alphazone/Books%20Html/OS.html

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**Operating System Galvin**

This book is derived from the previous editions, the first three of which were coauthored by James Peterson.

**Operating System Taninbaum**

The fourth edition of this book differs from the third edition in numerous ways. There are large numbers of small change

localhost:8383/Alphazone/Books%20Html/OS.html

## About These Books ?

**Galvin**

This edition has many new exercises and accompanying solutions, which were supplied by Arvind Krishnamurthy. We thank the following people who reviewed this version of the book: Bart Childs, Don Heller, Dean Hougen, Michael Huangs, Morley Kewstel, Euripides Montagne, and John Sterling. Our Acquisitions Editors, Bill Zobrist and Paul Crockett, provided expert guidance as we prepared this edition. They were assisted by Simon Durkin, who managed many details of this project smoothly. The Senior Production Editor was Kee Sanlor. The cover illustrator was Susan Cyr, and the cover designer was Madelyn Lesure. Beverly Peavler copy-edited the manuscript. The freelance proofreader was Katrina Avery; the freelance indexer was Rosemary Simpson. Marilyn Turnamian helped generate figures and presentation slides.

**Taninbaum**

The fourth edition of this book differs from the third edition in numerous ways. There are large numbers of small

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DBMS Navathe Korth

The screenshot shows the homepage of Alphazone with a banner for popular DBMS books. It features two book cards: 'DBMS Navathe' and 'DBMS Korth'. Each card includes a 'Download' button and a small thumbnail image.

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## About These Books ?

FREE CROSS-PLATFORM OPEN-SOURCE DATABASE SYSTEM

**Navathe**

This book is derived from the previous editions, the first three of which were coauthored by James Peterson.

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**Database Management System in Industry**

**Korth**

The fourth edition of this book differs from the third edition in numerous ways. There are large numbers of small changes.

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**Galvin**

This edition has many new exercises and accompanying solutions, which were supplied by Arvind Krishnamurthy. We thank the following people who reviewed this version of the book: Bart Childs, Don Heller, Dean Hougen, Michael Huangs, Morty Kewstel, Euripides Monlaque, and John Sterling. Our Acquisitions Editors, Bill Zobrist and Paul Crockett, provided expert guidance as we prepared this edition. They were assisted by Simon Durkin, who managed many details of this project smoothly. The Senior Production Editor was Ken Santor. The cover illustrator was Susan Cyr, and the cover designer was Madelyn Lesure. Beverly Peavler copy-edited the manuscript. The freelance proofreader was Katrina Avery; the freelance indexer was Rosemary Simpson. Marilyn Turnamian helped generate figures and presentation slides.

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Discrete Rosen

6	9	13	7
12		10	5
3	1	4	14
15	8	11	2

Discrete S. Chand

MATHS

For the instructor, my purpose was to design a flexible, comprehensive teaching tool using proven pedagogical techniques in mathematics.

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Discrete S. Chand

MATHS

Discrete mathematics describes processes that consist of a sequence of individual steps. This contrasts with calculus, which describes processes that change

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15 8 11 2

The goal of the book is to lay the mathematical foundation for computer science courses such as data structures, algorithms, relational database theory, automata theory and formal languages, compiler design, and cryptography, and for mathematics courses such as linear and abstract algebra, combinatorics, probability, logic and set theory, and number theory. By combining discussion of theory and practice, I have tried to show that mathematics has engaging and important applications as well as being interesting and beautiful in its own right.

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**KSOU**  
For the instructor, my purpose was to design a flexible, comprehensive teaching tool using proven pedagogical techniques in DS

**Rema thareja**  
The primary goal in computer problem-solving is an algorithm which is capable of being implemented as a correct and efficient computer program.

**Data Structure & Algorithms**

**Rosen**  
Computer problem-solving can be summed up in one word – it is demanding! It is an intricate process requiring much thought, careful planning, logical precision, persistence, and attention to detail. At the same time it can be challenging, exciting, and satisfying experience with considerable room for personal creativity and expression. If computer problem-solving is approached in this spirit then the chances of success are greatly amplified. In the discussion which follows in this introductory chapter we will attempt to lay the foundations for our study of computer problem-solving.

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**S. chand**  
This book is aimed at serving as a textbook for undergraduate engineering students of computer science and postgraduate level courses of computer applications. The objective of this book is to introduce the concepts of data structures and apply these concepts in problem solving. The book provides a thorough and comprehensive coverage of the fundamentals of data structures and the principles of algorithm analysis. The main focus has been to explain the principles required to select or design the data structure that will best solve the problem.

**Rosen**  
Computer problem-solving can be summed up in one word – it is demanding! It is an intricate process requiring much thought, careful planning, logical precision, persistence, and attention to detail. At the same time it can be challenging, exciting, and satisfying experience with considerable room for personal creativity and expression. If computer problem-solving is approached in this spirit then the chances of success are greatly amplified. In the discussion which follows in this introductory chapter we will attempt to lay the foundations for our study of computer problem-solving.

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These are just some of the questions facing us today. To answer these questions and more requires a sound foundation in computer organization and architecture, and this book by William Stallings provides a very timely and comprehensive foundation. It gives a complete introduction to the basics required, tackling what can be quite complex topics with apparent simplicity. Moreover, it deals with the more recent developments in this field, where innovation has in the past, and is, currently taking place. Examples are in superscalar issue and in explicitly parallel multicore. What is more, this latest edition includes two very recent topics in the design and use of GPUs for general-purpose use and the latest trends in cloud computing, both of which have become mainstream only recently. The book makes good use of examples throughout to highlight the theoretical issues covered, and most of these examples are drawn from developments in the two most widely used ISAs, namely the x86 and ARM.

**William Stallings**

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This book on algorithms for compiler design covers the various aspects of designing a language translator in depth. The book is intended to be a basic reading material in compiler design. Enough examples and algorithms have been used to effectively explain various tools of compiler design. The first chapter gives a brief introduction of the compiler.

**Ullman**

This book is about how to design and implement compilers. We shall discover that a few basic ideas can be used to construct translators for a wide variety of languages and machines. Besides compilers, the principles and techniques for compiler design are applicable to so many other domains that they are likely to be reused many times in the career of a computer scientist. The study of compiler writing touches upon programming languages, machine architecture, language theory, algorithms, and software engineering.



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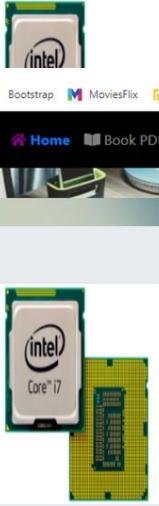


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### Goankar

Reference Book: – Ramesh S. Goankar, "Microprocessor Architecture, Programming and Applications with 8085", 5th Edition, Prentice Hall - Week 1 – Basic Concept and Ideas about Microprocessor - Week 2 – Architecture of 8085 - Week 3 – Addressing Modes and Instruction set of 8085 - Week 4 – Interrupts of 8085 - Week 5 onwards – Peripherals.



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**Robert Sedgewick**

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Java

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Guido van Rossum

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Python

Python

Mark Lutz

This book provides an introduction to the Python programming language. Python is a popular open source programming language

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Python

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### Java By Raghvan

This book introduces the principles of object-oriented programming through Java. The authors have taken care to give lucid, simple examples that make the reader understand the concepts easily. The examples do not have any reference from previous chapters, and can all be easily understood independently of the previous examples. The book is designed to be compatible with Java Development Kit (JDK) v.1.5 and later. A few chapters briefly mention some of the newer classes and methods available in JDK v. 1.6. They have provided guidelines to create and run the program in the Command window of the Windows environment, and the use of Netbeans IDE to develop an application. Through this, the reader can gain excellent practical skills in analyzing and running the programs.

### Python by Guido

interactive "shell" • basic types: numbers, strings • container types: lists, dictionaries, tuples • variables • control structures • functions & procedures • classes & instances • modules & packages • exceptions • files & standard library • what's new in Python 2.0 and beyond

## D). Notes:

The screenshot shows the homepage of the Alphazone website. At the top, there is a navigation bar with links for Home, Book PDF, Notes PDF, Faculty Zone, and Dev:Aman Kushwaha. A search bar is also present. The main banner features a smartphone and a pen on a desk, with the text "Get Most Popular Computer Network Handwritten Notes" and "Learn and Implement". Below the banner, there are two buttons: "Download" and "Open". The main content area has a dark blue header with the text "Module Wise Notes By Some Good Students Of Our GLA". Below this, there are three tabs: Module 1 (selected), Module 2, and Module 3.

This screenshot shows a specific page for "Module Wise Notes By Some Good Students Of Our GLA". The top navigation bar and search bar are visible. The main content area features a large banner with the text "Module Wise Notes By Some Good Students Of Our GLA". Below the banner, there are three tabs: Module 1 (selected), Module 2, and Module 3. Under the "Module 1" tab, there is a section titled "Computer Network Handwritten Notes Mid-1" with a "Download" button and an image of a hand holding a smartphone displaying network icons. Another section titled "Computer Network Handwritten Notes Mid-2" is also shown with a "Download" button and an image of a server room.

This screenshot shows a detailed view of the handwritten notes for "Computer Network". It features two main sections: "Unit 1" and "Unit 2".  
**Unit 1:** Includes an introduction about network topologies (WAN, LAN, MAN), reference models (OSI and TCP/IP), physical layer, and various multiplexing techniques. It also covers data link layer design issues, error detection, and correction protocols like Sliding Window.  
**Unit 2:** Discusses the data link layer services, framing, error control, flow control, and error detection/correction. It covers error-correcting codes, elementary data link protocols (Simplex, Stop and Wait, Go-Back-N, Selective Repeat), and various access methods including CSMA/CD, TDMA, FDMA, and TDMA. It also includes a brief on wireless LAN protocols like Ethernet and Gigabit Ethernet.  
At the bottom of the page, the URL "localhost:8383/Alphazone/Alphazone/Notes Html/CN.html#"

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## Module Wise Notes By Some Good Students Of Our GLA

Module 1 Module 2 Module 3

Module 1: 15 Marks  
Time 1:00H

**TOC**

### Handwritten Notes Mid-1

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**TOC**

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## Unit 1

Fundamentals : Strings, Alphabet, Language, Operations, Finite state machine, definitions, finite automaton model, acceptance of strings, and languages, deterministic finite automaton and non deterministic finite automaton, transition diagrams and Language recognizers. Finite Automata : NFA with  $\tilde{\epsilon}$  transitions – Significance, acceptance of languages. Conversions and Equivalence : Equivalence between NFA with and without  $\tilde{\epsilon}$  transitions, NFA to DFA conversion, minimisation of FSM, equivalence between two FSM's, Finite Automata with output- Moore and Melay machines.

## Unit 2

Regular Languages : Regular sets, regular expressions, identity rules, Constructing finite Automata for a given regular expressions, Conversion of Finite Automata to Regular expressions. Pumping lemma of regular sets, closure properties of regular sets (proofs not required). Grammar Formalism : Regular grammars-right linear and left linear grammars, equivalence between regular linear grammar and FA, inter conversion, Context free grammar, derivation trees, sentential forms. Right most and leftmost derivation of strings.

## Unit 3

Context Free Grammars : Ambiguity in context free grammars. Minimisation of Context Free Grammars. Chomsky normal form, Greiback Normal form for Context Free Languages. Enumeration of properties of CFL (proofs omitted). Push Down Automata - Push

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**OS**

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**OS**

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**Operating Systems Introduction:** What is an Operating System, Simple Batch Systems, Multi-programmed Batches systems, Time-Sharing Systems, Personal-computer systems, Parallel systems, Distributed Systems, Real-Time Systems, OS – A Resource Manager. Memory Organization & Management: Memory Organization, Memory Hierarchy, Memory Management Strategies, Contiguous versus non-Contiguous memory allocation, Partition Management Techniques, Logical versus Physical Address space, swapping, Paging, Segmentation, Segmentation with PagingVirtual Memory: Demand Paging, Page Replacement, Page-replacement Algorithms, Performance of Demand Paging, Thrashing, Demand Segmentation, and Overlay Concepts.

**Unit 2**

**Processes:** Introduction, Process states, process management, Interrupts, Interprocess Communication **Threads:** Introduction, Thread states, Thread Operation, Threading Models. **Processor Scheduling:** Scheduling levels, pre-emptive vs no pre-emptive scheduling, priorities, scheduling objective, scheduling criteria, scheduling algorithms, demand scheduling, real-time scheduling. **Process Synchronization:** Mutual exclusion, software solution to Mutual exclusion problem, hardware solution to Mutual exclusion problem, semaphores, Critical section problems. Case study on Dining philosopher problem, Barbershop problem, etc.

**Unit 3**

**Deadlocks:** examples of deadlock, resource concepts, necessary conditions for deadlock, deadlock solution, deadlock prevention, deadlock avoidance, deadlock detection, Deadlock handling, Deadlock recovery, Deadlock avoidance, Deadlock detection, Deadlock prevention, Deadlock handling, Deadlock recovery.

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**DBMS**

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Database Management System in Industry

**DBMS**

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## Unit 1

**Introductory Concepts of DBMS:** Introduction and application of DBMS, Data Independence, Database System Architecture – levels, Mapping, Database users and DBA, Entity-Relationship model, constraints, keys, Design issues, E-R Diagram, Extended E-R features-Generalization, Specialization, Aggregation, Translating E-R model into Relational model.

## Unit 2

**Functional Dependencies:** Non-loss Decomposition, First, Second, Third Normal Forms, Dependency Preservation, Boyce/Codd Normal Form, Multi-valued Dependencies and Fourth Normal Form, Join Dependencies, and Fifth Normal Form. **Relational Model:** The relational Model, The catalog, Types, Keys, Relational Algebra, Fundamental operations, Additional Operations, SQL fundamentals, DDL, DML, DCL. **PL/SQL Concepts:** Cursors, Stored Procedures, Stored Functions, Database Integrity – Triggers.

## Unit 3

**Transaction Management:** ACID properties, serializability of Transaction, Testing for Serializability and concurrency control, Lock based concurrency control (2PL, Deadlocks), Time stamping methods, Database recovery management. **Implementation Techniques:** Overview of B+ tree Organization, Indexing and Hashing, B+ tree Index Files, Query Processing Overview, Catalog Information for

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Module 1 Module 2 Module 3

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**Data Structure**

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Arrays: single and multi-dimensional arrays, analysis of insert, delete, and search operations in arrays (both linear search and binary search), implementing sparse matrices, applications of arrays to sorting Sorting: selection sort, insertion sort, bubble sort, comparison of sorting techniques via empirical studies. Introduction to Vectors. Linked Lists: Singly-linked, doubly-linked and circular lists, analysis of insert, delete, and search operations in all the three types, implementing sparse matrices. Introduction to Sequences.

### Unit 2

Queues: Array and linked representation of queue, de-queue, comparison of the operations on queues in the two representations. Applications of queues. Stacks: Array and linked representation of stacks, comparison of the operations on stacks in the two representations, implementing multiple stacks in an array. Applications of Stacks: prefix, infix, and postfix expressions, utility, and conversion of these expressions from one to another; applications of stacks to recursion: developing recursive solutions to simple problems, advantages, and limitations of recursion.

### Unit 3

Trees: Introduction to tree as a data structure; binary trees, binary search trees, analysis of insert, delete, search operations, recursive and iterative traversals on binary search trees. Height-balanced trees (AVL), B trees, analysis of insert, delete, search operations on AVL, and B trees. Heaps: Introduction to heap as a data structure, analysis of insert, extract-min/max, and delete-min/max operations, applications to priority queues. Hash Tables: Introduction to hashing, hash tables, and hashing functions -insertion, resolving collision by

localhost:8383/Alphazone/Alphazone/Notes\_Html/Notes/ds 2.pdf searching and their analysis, properties of a good hash function

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Module 1 Module 2 Module 3

Module 1: 15 Marks  
Time: 1:00H

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### Unit 1

Unit I – Basic structure of Computers Operational concepts – Bus structures – Arithmetic operations – Memory operations – Addressing modes – Basic I/O operations – Performance-RISC – CISC.

### Unit 2

Arithmetic Unit Addition & subtraction of signed numbers – Binary Multiplication: Booth's algorithm – Bit pair recoding – Carry save addition – Unsigned Integer multiplication & division algorithm – Floating point operations.

### Unit 3

I/O Organization and Logic Circuits Accessing I/O devices – Interrupts – DMA -Buses – Interface circuits – Serial communication links – Logic Circuits – Practical Implementation of Logic Gates – Case studies of various computer architectures

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**Compiler**

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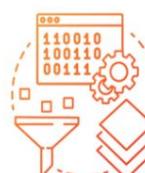


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Module 1 Module 2 Module 3

Module 1: 15 Marks  
Time: 1:00H

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**Unit 1**

Instruction Set of 8086: Addressing Modes: Instruction format: Discussion on instruction Set: Groups: data transfer, arithmetic, logic string, branch control transfer, processor control. Interrupts: Hardware and software interrupts, responses and typesArchitecture of INTEL 8086 (Bus Interface Unit, Execution unit), register organization, memory addressing, memory segmentation, Operating Modes

**Unit 2**

Central Processing Unit, memory and input/output interfacing. Memory Classification Volatile and non-volatile memory, Primary and secondary memory, Static and Dynamic memory, Logical, Virtual and Physical memory..

**Unit 3**

Magnetic core memory, binary cell, Rom architecture and different types of ROM, RAM architecture, PROM, PAL, PLA, Flash and Cache memory, SDRAM, RDRAM and DDRAM. Memory latency, memory bandwidth, memory seek time.

localhost:8383/Alphazone/Alphazone/Notes Html/Micro.html#

**f) BackEnd:**  
**Server : Amazon AWS-Simple Email Service(SES),IAM and s3**

The screenshot displays two browser windows side-by-side. The left window shows a local registration form with fields for name, email, password, category (Computer Network, Operating System, Data Structure, DBMS), and a 'Register' button. The right window shows the AWS IAM Management Console for a user named 'aman'. It lists attached policies: 'AmazonSESFullAccess' (AWS managed policy) and 'aman-s3-policy' (Inline policy). A large blue arrow points from the IAM console towards the registration form.

**Database: Mongoose Atlas**

The screenshot shows two browser windows. The left window is a local login form with fields for email, password, and a 'Login' button. The right window is the MongoDB Atlas interface, specifically the 'Atlas' tab under the 'dbname' database, showing the 'users' collection. It displays a single document with the following data:

```

{
  "_id": "ObjectID('5f9907431e96e11ab193c89')",
  "role": "subscriber",
  "username": "olamkho2j",
  "name": "Aman Kushwaha",
  "email": "reactnodeaws57@gmail.com",
  "salt": "1377111597998",
  "hashed_password": "73d6059a07f1a0c2a88fd550b6a544c6d68a5",
  "createdAt": "2020-10-28T12:14:03.682+00:00",
  "updatedAt": "2020-10-28T12:14:03.682+00:00"
}
  
```

A large blue arrow points from the MongoDB interface towards the login form.

## f). Admin Side:

The left window shows a 'Create category' form with fields for Name (Binary Search Tree), Content (a code editor with C++ code), and an 'Upload image' button. The right window shows the 'Atlas' section of the IAM Management Console with a document in the <dbname>.users collection.

```

_id: ObjectId("5f99907431e9de1ab193c89")
role: "admin"
username: "amankushwaha57"
name: "amankushwaha57"
email: "amankushwaha57@gmail.com"
hashed_password: "736ddcf5007f4adcf2a885fd550b6a544c6d68a5"
createdAt: 2020-10-28T18:24:83.682+00:00
updatedAt: 2020-10-28T18:24:83.682+00:00
_v: 0
  
```

The screenshot shows a grid of category cards. Each card contains an icon, the category name, and 'Update' and 'Delete' buttons.

Category	Actions
Computer Network	<a href="#">Update</a> <a href="#">Delete</a>
Operating System	<a href="#">Update</a> <a href="#">Delete</a>
Data Structure	<a href="#">Update</a> <a href="#">Delete</a>
DBMS	<a href="#">Update</a> <a href="#">Delete</a>
Compiler	<a href="#">Update</a> <a href="#">Delete</a>
Automata	<a href="#">Update</a> <a href="#">Delete</a>
Micro processor	<a href="#">Update</a> <a href="#">Delete</a>

localhost:3000/admin/category/read

Home Submit a link Aman Kushwaha Logout

## List of categories

	Computer Network	<a href="#">Update</a>		Operating System	<a href="#">Update</a>
	Data Structure	<a href="#">Update</a>		DBMS	<a href="#">Update</a>
	Compiler	<a href="#">Update</a>		Automata	<a href="#">Update</a>
	Micro processor	<a href="#">Update</a>			<a href="#">Delete</a>

localhost:3000/links/automata

Type here to search 03:04 AM 20-11-2020

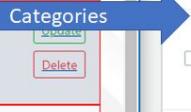
## S3 Bucket:

localhost:3000/admin/category/read

Home Submit a link Aman Kushwaha Logout

## List of categories

	Computer Network	<a href="#">Update</a>		Operating System	<a href="#">Update</a>
	Data Structure	<a href="#">Update</a>		DBMS	<a href="#">Update</a>
	Compiler	<a href="#">Update</a>		Automata	<a href="#">Update</a>
	Micro processor	<a href="#">Update</a>			<a href="#">Delete</a>



localhost:3000/links/dbms

s3.console.aws.amazon.com

AWS Services More

Name	Type	Last modified
11a952ae-3abe-4cc7-bf87-69897db1c38c.jpeg	jpeg	November 2, 2020, 18:30 (UTC+05:30)
2b41d2ad-8e2b-4df4-9d1c-eb481b0b4ef0.jpeg	jpeg	November 2, 2020, 18:29 (UTC+05:30)
2cd6a86d-76e1-4f18-8c69-e36edb74af71.jpeg	jpeg	November 19, 2020, 23:29 (UTC+05:30)

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Type here to search 03:08 AM 20-11-2020

### g). User Back End:

The screenshot shows two windows side-by-side. On the left is a browser window titled 'Submit Link/URL' with a form for inputting a link, category, type, medium, title, and URL. A large blue arrow points from this window to the right window. On the right is the 'S3 Management Console' showing the 'Data | Atlas: MongoDB Atlas' section. It displays the 'react-node-aws' cluster with the 'Collections' tab selected. Under the 'links' collection, a document is shown with the '\_id' field set to 'ObjectID("5f99c856918c3b1197f7")'. The document details include: categories: Array, type: "free", medium: "video", clicks: 4, title: "Introduction to REST", url: "https://zoom.us/rec/play/l8goqbjYDy6CVanC", slug: "https://zoom.us/rec/play/l8goqbjYDy6CVanC", postedBy: ObjectID("5f99c856918c3b1197f7"), createdAt: 2020-11-19T18:07:35.305Z, updatedAt: 2020-11-19T18:09:00.708Z, and \_\_v: 0.

### User Link DataBase for Subscriber(User):

The screenshot shows two windows side-by-side. On the left is a browser window titled 'Client's dashboard /subscriber' with a 'Your links' section and a 'Formal language' section. The 'Formal language' section contains a link: 'https://zoom.us/rec/play/l8goqbjYDy6CVanC' and a timestamp '4 hours ago by Client'. On the right is the 'S3 Management Console' showing the 'Data | Atlas: MongoDB Atlas' section. It displays the 'react-node-aws' cluster with the 'Users' collection. A user document is shown with the '\_id' field set to 'ObjectID("5f99e07d101f60b1c82b09")'. The document details include: role: "admin", username: "akushchuk", name: "Anan Kuschuk", email: "resctnodeaws57@gmail.com", hashed\_password: "095317af566066f551dc585ceffcc97412dec64", created\_at: 2020-10-28T21:55:08.261+00:00, updated\_at: 2020-11-19T17:54:27.499+00:00, \_\_v: 0, and categories: Array. Another user document is shown with the '\_id' field set to 'ObjectID("5f99e11b18039c5f4b0844c")'. The document details include: role: "client", username: "nkirkoglyv", name: "Client", email: "nkirkoglyv@gmail.com", salt: "1567144901431", hashed\_password: "0597476d64eb77393770455bd34c782be416e2", created\_at: 2020-11-03T04:48:28.038+00:00, updated\_at: 2020-11-19T21:47:15.638+00:00, and \_\_v: 0.

## **6. Hardware and Software Requirement**

### **1. Hardware Requirements:**

>> Personal Computer with minimum of 4GB RAM and core i3 Processor.

### **2. Software Requirements:**

>> Windows Operating System.

>> Integrated Development Environment ( IDE ) - Visual Studio Code 1.47

>> Apache NETBEANS IDE 11.3

>> GitHUB Desktop 2

>> Adobe PhotoShop version 8

>> Adobe XD version

### **3. Language and Framework Requirements:**

>> NodeJS 12.18. 3

>> HTML 5

>> BOOTSTRAP 4 / 5

>> ReactJS 16.9 / 17

>> CSS 3

>> NextJS 9.5.2

>> MongoDB 4.2.8

### **4. Cloud Platform:**

>> Amazon Web Services ( AWS )

## **6.SRS**

This document describes the software requirements specification (SRS) for the Alphazone management System that provides the access and management of information of different modules in a category Students, Guardians, Teachers/Faculty.. Our project is based on a database, which stores and maintains the information of different modules within the system. The advantage of the Alphazone database system is to avoid entries in hard copies and it saves the burden of hard copies of data. The system is a Desktop Application and GUI for this system is developed in JS. The Database for this management system is created in Mongoose Atlas. There are two users for this system

1. Admin (have full access to read and write of all modules in Alphazone system)
2. Teacher (have access limited to write and manage Zoom Recording, etc.).

The purpose of this document is to retrieve and analyze the ideas that define the product and requirements that the user needs. This document describes the details of our product, its parameter, and its goals. It describes the target, audience, user interface of product and Software/Hardware requirements of our product. This document also describes the problem we have faced during the designing and implementation of the product and also describes how we have solved this problem and make our product more efficient. The Alphazone system saves the human power and time cost to perform the same task. The data in the database can be saved for a long time and can be used for different purposes in the future. In Alphazone systems, there is a minor chance of losing the data. This document also defines how customers and users see our product and understand the functionality of the product. This document will help the developers/designers in case of maintenance of the software product.

## **7.Project Scope**

The main focus of this project is to give the best GUI for the users and provide the many modules in a single product. Admin can view all of the information that is stored in the database through application and admin also can modify this information because the admin has full access to the system. **E-learning** is a subset of education technology which offers an **online learning** and teaching platform to disperse knowledge with the help of internet technology. **Elearning** offers conceptual and experimental learning through machines, media platforms and network solutions.

## **8.Conclusion**

My project is only a humble venture to satisfy the needs to manage their project work. Several user friendly coding have also adopted. This package shall prove to be a powerful package in satisfying all the requirements. The objective of software planning is to provide a frame work that enables the manager to make reasonable estimates made within a limited time frame at the beginning of the software project and should be updated regularly as the project progresses.

## **References**

**CSS:** The Definitive Guide

HTML5 Missing Manual

[www.wikipedia.com](http://www.wikipedia.com)

[www.w3school.com](http://www.w3school.com)

[www.stackoverflow.com](http://www.stackoverflow.com)

[www.tutorialspoint.com](http://www.tutorialspoint.com)

[www.javapoint.com](http://www.javapoint.com)

[www.youtube.com](http://www.youtube.com)

<https://www.php.net/manual/en/function.ucfirst.php/>

[https://www.w3schools.com/howto/howto\\_google\\_fonts.asp /](https://www.w3schools.com/howto/howto_google_fonts.asp/)

<https://www.iconfinder.com/>

## **Appendices**

In the pages set out below we introduce Hypertext Markup Language (HTML), Cascading Style Sheets (CSS) and Bootstrap, the three core components of most web pages.

In these pages, text used within HTML, CSS or JavaScript files is generally shown in courier new (i.e. a fixed space) font. The pages contain links to an extensive body of reference material explaining HTML, CSS in detail. We also provide a wide range of examples, which can help you understand better how HTML, Bootstrap work. See below for further details on how to access these examples

### Hypertext Markup Language (HTML)

1. Introduction
2. Getting started
3. Carriage returns and thematic break lines
4. Commenting
5. Special characters
6. Hyperlinks
7. HTML elements (and their attributes)
8. Browser feature detection

### Cascading Style Sheets (CSS)

1. Introduction
2. Selectors
3. Hints and further information