

DATABASE MANAGEMENT SYSTEMS

1) INTRODUCTION : Data base systems – data models – instances and schemes – Database Models – Relation ,Hierarchical and Network – Data independence – DDL and DML – Data base manager – database administrator – data base users – overall system Architecture.

2) ENTITY RELATIONSHIP MODEL : Entity and entity sets – relationships and relationship sets – entity – relation ship diagram – generalization - aggregation.

3) Relational model : structure of relation database – the relation algebra – the tuple relation calculus and the domain relational calculus – Relation commercial languages – SQL,QBE.

4) Integrity constraints : Domain constraints – referential integrity – functional dependencies – assertions and triggers

5) Relation database design :Normalization using functional dependencies , multi valued dependencies and join dependencies – domain key normal form

6) File and system architecture : File organization – sequential files – mapping relation data to files – data directory storage – buffer management – indexing – B+ B trees ,index files – static and dynamic ,hash functions – index definitions in SQL server.

7) Crash recovery :Failure classification – log based recovery – shadow paging

8) Concurrency control : Schedules – testing for serillizablility – lock _ based protocols – time stamp based protocols – validation techniques – multiple granularity – multi version schemes.

9) Security and integrity : security and integrity violations – security specifications in SQL – statistical data bases.

Text Book :

Henry F korth and Abraham siber schatz – data base system concepts “ MGH

COMPUTER COMMUNICATION AND NETWORKS

Hardware reference models – transmissions media – narrowband ISDN – Broadband – ISDN – ATM.

The data link layer – Design issues – Error detection and correction – Elementary data link protocols – sliding window protocol – data link layer in HDCL ,internet
Channel allocation methods – TDM,FDM, ALOHA, Carrier sense Multiple access Protocols,collision free protocols- IEEE standard for 802 for LANS-Ethernet,Token bus,Token ring- Bridges.

NETWORK LAYER – Routing,Algorithms- Shortest Path,Flooding,Flow based ,Distance Vector,Link state,Hierarchical, Broadcast routing.Congestion Control algorithms- General principles of congestion control, Congestion prevention policies, Choke packets and Load shedding.

Internetworking-Concatenated virtual circuits, connection less internetworking,Tunneling,internetworking,Fragmentation,Firewalls, Network Layer in the Internet- IP protocols, IP address, Subnets, Internet control protocols, CSPF, BGP, Internet multicasting, Mobile IP, Network layer in the ATM networks- Cell formats, Connection setup, Routing and switching, service categories, and Quality of service.

The Transport Layer – Elements of Transport protocols- Addressing, Establishing a connection, releasing a connection, Flow control and buffering, and Crash Recovery.
End to End protocols-UDP, reliable byte string(TCP) – Segment format, Connection establishment and termination, sliding window revisited, adaptive retransmission, TCP extensions Remote procedure call.

Application layer- Network security – Cryptographic algorithms, Security Mechanisms, Privacy enhanced mail (PEM),PGP,TLS,SSL,HTTPS,IP security. Fire-walls, filter based fire walls, proxy-based fire walls, limitations.

SNMP-SNMP model, ASN.1,SMI,MIB, the SNMP protocol. Electronic mail-Architecture and service, user agent ,message formats, message transfer, Email privacy.
The World WIDE WEB – client side, server side, writing a WEB page in HTML.

Text Book:

1. Computer Networks – Andrew Tanenbaum, Prentice Hall of India, New Delhi – Third edition.

ADVANCED UNIX PROGRAMMING

MC3.3

1. Unix utilities – 1

Introduction to Unix file system .vi editor, file handling utilities , security by file permissions process utilities, disk utilities, networking commands cp,mv,in,rm,unlink,mkdir,rmdir,du,df,mount,umount,find.umask,ps,who,w,finger,atp,ftp,telnet,rlogin.

2. Unix utilities: -2

The processing utilities and backup utilities. Detailed commands to be covered are : cat,tail,head,sort,nl,uniq,grep,fgrep,cut,past,jointee,more,pg,comm.,cmp,diff,tr,awk,tar ,cpio.

3. What is a shell ,shell responsibilities ,pipes and input redirection output redirection and here documents. The shell as programming language shell variables conditions history and control structures and shell programming.

4. Unix Internals – 1:

Unix file structure, directories, files and devices, system calls and device drivers, library functions, Low-Level file access (write, read, open, close, ioctl, lseek, fstat, stat, dup and dup2), the standard I/O (fopen, fread, fclose, fflush, fseek,,fgetc, getc, getchar, fputc, putc putchar, fgets, gets), formatted I/O, Stream Errors, streams and file descriptors, File and directory maintenance (chmod, chown, unlink, link, symlink, mkdir, rmdir, chdir, getcwd).

5. Unix Internals – 2:

Process and Signals: What is process, process structure, starting new process, waiting for a process, zombie process, process control: process identifiers, fork function, vfork, exit, wait, exec, system functions, user identification, process times signal:- Signal functions, unreliable signals, interrupted system calls, kill and raise functions, alarm, pause functions, abort, system, sleep functions.

6. Unix Internals – 3

Data Management:- management memory (simple memory allocation, freeing memory), file locking (creating lock files, locking regions, use of read/write locking, competing locks, other commands, dead locks).

7. Unix Internals – 4

Inter-process: pipe, process pipes, the pipe call, parent-child process, named pipes:FIFOs), semaphores, message queus and shared memory applications of IPC.

REFERENCES:

1. ADVANCED Programmng in the UNIX Environment (W. Richard Stevens).
2. UNIX Network Programming (Richard Stevens).

MC 3.4 MANAGEMENT INFORMATION SYSTEMS

1. The meaning and role of MIS: What is MIS?. Decision support systems, systems approach, the systems view of business, MIS Organization within the company.
2. Management Organizational theory and the systems approach: Development of organization theory, management and organizational behavior, management, information, and the systems approach.
3. Information Systems for decision making: Evolution of an information system, Basic Information Systems, decision making and MIS, MIS as a technique for making programmed decisions, decision assisting information systems.
4. Strategic and project planning for MIS: General business planning, appropriate MIS response, MIS planning – general, MIS planning – details.
5. Conceptual system design: Define the problems, set system objectives, establish system constraints, determine information needs, determine information sources, develop alternative conceptual designs and select one, document the system concept, prepare the conceptual design report.
6. Detail System design: Inform and involve the organization, aim of detailed design, project management of MIS detailed design, identify dominant and trade off criteria, define the subsystems, sketch the detailed operating sub systems and information flows, determine the degree of automation of each operation inform and involve the organization again, inputs, outputs and processing early system testing, software, hardware and tools propose an organization to operate the system, document the detailed design, revisit the manager – user.
7. Implementation, evaluation and maintenance of the MIS: Plan the implementation, acquire floor space and plan space layouts, organize for implementation, develop procedures for implementation, train the operating personnel, computer related acquisitions, develop forms for data collection and information, dissemination, develop the files, test the system, cut over, document the system, evaluate the MIS, control and maintain the system.
8. Pitfalls in MIS development: Fundamental weaknesses, soft spots in planning, design problems, implementation: The TAR PIT.

Text book:

Information Systems for Modern Management, third edition by R. G. Murdick, J. E. Ross and J. R. Clagget, PHI – 1994.

MC 3.5 OPERATIONS RESEARCH

UNIT 1:

Development: Definition, Characteristics and Phrases, scientific method. Types of models, general methods for solving, operations research modes. Allocation, introduction, linear programming formulation graphical solution, simplex method, artificial variable technique, duality principle.

UNIT 2:

Transportation problem: formulation, optimal solution, unbalanced transportation, assignment problem: formulation, optimal solution, variations problem, degeneracy i.e. non square (MXN) matrix, restrictions, sequencing: Introduction, optimal solution for processing each of n jobs through three machines, traveling salesman problem (i.e.) shortest acyclic route models.

UNIT 3:

Replacement: Introduction, replacement of items that deteriorate when money value is not counted and counted, replacement of items that fail completely (i.e.) group replacements. Waiting lines: introduction, single channel, poisson arrivals, exponential service time infinite population and unrestricted queue.

UNIT 4:

Inventory: introduction, single item, deterministic models, production is instantaneous or at a constant rate, shortages are allowed or not allowed and withdrawals from stock is continuous, purchase inventory model with one price break, shortages are not allowed, instantaneous production demand production or purchase cost is relevant, stochastic models, demand may be discrete or variable or instantaneous production, instantaneous demand and no setup cost.

UNIT 5:

Theory Of Games: Introduction, minimax (maximum), criterion and optimal strategy solution of games with saddle points, rectangular without saddle points. Dynamic programming: Introduction, Bellman's principle of optimality, solutions of problems with finite number of stages.

TEXT BOOKS: 1. Operations Research – S. D. Sharma

2. –DO-

- P. K. Gupta & D. S. Hira

3. –DO-

- R. D. Asrhedkar & R. V. Kulkarni

