RAJIV GANDHI PROUDYOGIKI VISHWAVIDYALAYA, BHOPAL

New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD501-Theory of Computation

COURSE OBJECTIVE:

- To understand computability, decidability and complexity through problem solving.
- To analyse and design abstract model of computation & formal languages
- To understand and conduct mathematical proofs for computation and algorithms.

COURSE OUTCOMES:

After completion of this course, the students would be able to:

CO1. explain the basic concepts of switching and finite automata theory & languages.

CO2. relate practical problems to languages, automata, computability and complexity.

CO3. construct abstract models of computing and check their power to recognize the languages.

CO4. analyze the grammar, its types, simplification and normal form.

CO5. interpret rigorously formal mathematical methods to prove properties of languages, grammars and automata.

CO6. develop an overview of how automata theory, languages and computation are applicable in engineering application.

COURSE CONTENTS:

Unit-I Introduction of Automata Theory: Examples of automata machines, Finite Automata as a language acceptor and translator, Moore machines and mealy machines, composite machine, Conversion from Mealy to Moore and vice versa.

Unit-II Types of Finite Automata: Non Deterministic Finite Automata (NDFA), Deterministic finite automata machines, conversion of NDFA to DFA, minimization of automata machines, regular expression, Arden's theorem. Meaning of union, intersection, concatenation and closure, 2 way DFA.

Unit-III Grammars: Types of grammar, context sensitive grammar, and context free grammar, regular grammar. Derivation trees, ambiguity in grammar, simplification of context free grammar, conversion of grammar to automata machine and vice versa, Chomsky hierarchy of grammar, killing null and unit productions. Chomsky normal form and Greibach normal form.

Unit-IV Push down Automata: example of PDA, deterministic and non-deterministic PDA, conversion of PDA into context free grammar and vice versa, CFG equivalent to PDA, Petrinet mode

Unit-V Turing Machine: Techniques for construction. Universal Turing machine Multitape, multihead and multidimensional Turing machine, N-P complete problems. Decidability and Recursively Enumerable Languages, decidability, decidable languages, undecidable languages, Halting problem of Turing machine & the post correspondence problem.

TEXT/ REFERENCE BOOKS:

1. Introduction to Automata Theory Language & Computation, Hopcroft& Ullman, Narosa Publication.
2. Element of the Theory Computation, Lewis &Christors, Pearson.
3. Theory of Computation, Chandrasekhar & Mishra, PHI.
4. Theory of Computation, Wood, Harper & Row.
5. Introduction to Computing Theory, Daniel I-A Cohen, Wiley.

COURSE OUTCOMES:

After completion of lab work, the students would be able to:
CO1: judge various computational models.
CO2: construct abstract models of computing.
CO3: justify the power of abstract models in computing to recognize the languages.
CO4: demonstrate analytical thinking and intuition for problem solving in the related areas.
CO5: discuss the limitations of computation in problem solving.
CO6: follow set of rules for syntax verification

LIST OF EXPERIMENTS:

1. Design a Program for creating machine that accepts three consecutive one.
2. Design a Program for creating machine that accepts the string always ending with 101.
3. Design a Program for Mode 3 Machine
4. Design a program for accepting decimal number divisible by 2.
5. Design a program for creating a machine which accepts string having equal no. of 1's and 0's.
6. Design a program for creating a machine which count number of 1's and 0's in a given string.
7. Design a Program to find 2's complement of a given binary number.
8. Design a Program which will increment the given binary number by 1.
9. Design a Program to convert NDFA to DFA.
10. Design a Program to create PDA machine that accept the well-formed parenthesis.
11. Design a PDA to accept WCWR where w is any string and WR is reverse of that string and C is a Special symbol.
12. Design a Turing machine that's accepts the following language a n b n c n where n>0.

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD 502- Database Management Systems

COURSE OBJECTIVES: The objective of this course is to enable students in developing a high level understanding of the concepts of Database management systems in contrast with traditional database management systems with emphasis on skills to apply these concepts in building, maintaining and retrieving data from these DBMS.

COURSE OUTCOMES:

After completing the course student should be able to:

1. Describe design of a database at various levels and compare and contrast traditional data processing with DBMS.
2. Design a database using Entity Relationship diagram and other design techniques.
3. Apply fundamentals of relational model to model and implement a sample Database Management System for a given domain.
4. Evaluate and optimize queries and apply concepts of transaction management.

COURSE CONTENTS:

UNIT I: DBMS Concepts and architecture Introduction, Database approach v/s Traditional file accessing approach, Advantages of database systems, Data models, Schemas and instances, Data independence, Data Base Language and interfaces, Overall Database Structure, Functions of DBA and designer, ER data model: Entitles and attributes, Entity types, Defining the E-R diagram, Concept of Generalization, Aggregation and Specialization. Transforming ER diagram into the tables. Various other data models object oriented data Model, Network data model, and Relational data model, Comparison between the three types of models. Storage structures: Secondary Storage Devices, Hashing and Indexing structures: Single level and multilevel indices.

UNIT II: Relational Data models: Domains, Tuples, Attributes, Relations, Characteristics of relations, Keys, Key attributes of relation, Relational database, Schemas, Integrity constraints. Referential integrity, Intension and Extension, Relational Query languages: SQLDDL, DML, integrity constraints, Complex queries, various joins, indexing, triggers, assertions , Relational algebra and relational calculus, Relational algebra operations like select, Project ,Join, Division, outer union. Types of relational calculus i.e. Tuple oriented and domain oriented relational calculus and its operations.

UNIT III: Data Base Design: Introduction to normalization, Normal forms- 1NF, 2NF, 3NF and BCNF, Functional dependency, Decomposition, Dependency preservation and lossless join, problems with null valued and dangling tuples, Multivalued dependencies. Query Optimization: Introduction, steps of optimization, various algorithms to implement select, project and join operations of relational algebra, optimization methods: heuristic based, cost estimation based.

UNIT IV: Transaction Processing Concepts: -Transaction System, Testing of Serializability, Serializability of schedules, conflict and view serializable schedule, recoverability, Recovery from transaction failures. Log based recovery. Checkpoints deadlock handling. Concurrency Control Techniques: Concurrency Control, locking Techniques for concurrency control, time stamping protocols for concurrency control, validation based protocol, multiple granularity. Multi version schemes, Recovery with concurrent transaction. ntroduction to Distributed databases, data mining, Data warehousing, Object Technology and DBMS, Comparative study of OODBMS Vs DBMS, Temporal, Deductive, Multimedia, Web and Mobile database.

UNIT V: Case Study of Relational Database Management Systems through Oracle/PostgreSQL /MySQL: Architecture, physical files, memory structures, background process. Data dictionary, dynamic performance view. Security, role management, privilege management, profiles, invoker defined security model. SQL

queries, Hierarchical quires, inline queries, flashback queries. Introduction of ANSI SQL, Cursor management: nested and parameterized cursors. Stored procedures, usage of parameters in procedures. User defined functions their limitations. Triggers, mutating errors, instead of triggers.

TEXT BOOK:

1. Korth H.F. &Silberschatz A., Sudarshan, "Database Systems", McGraw-Hill
2. Chris J. Date, with Hugh Darwin, Addison-Wesley, "A Guide to SQL Standard".
3. Elmasri R., Navathe S.B., "Fundamentals of Database Systems", Pearson.

REFERENCE BOOKS:

1. Rob, " Database System:Design Implementation& Management", Cengage Learning.
2. AtulKahate , "Introduction to Database Management System", Pearson Educations
3. Oracle 9i Database Administration Fundamental-I, Volume I, Oracle Press,TMH.
4. Paneerselvam,"Database Management System", PHI Learning

List of Experiments:

1. Create a table and perform insert, delete, update and select operation on it.
2. Display the rows from table using various Select Clauses.
3. Delete alternate row from table.
4. Update multiple rows in using single update statement.
5. Perform queries using Having, Group by and Order by clauses.
6. Perform Aggregate functions in sql.
7. Perform String functions in sql.
8. Perform Date and Time functions in table.
9. Display the three record in the first row and two records in the second row and one record in the third row in a single sql statements.
10. Write a sql statements for rollback commit and save points.
11. In this subject the students are supposed to prepare any one case studies using ER data model (design of the database) in complete semester like Financial Accounting System, Railway Reservation System, Institute Timetable Management System. Student Record System, Library Management System, Hospital Management System etc.

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD503 (A) Data Analytics

UNIT-I: DESCRIPTIVE STATISTICS :Probability Distributions, Inferential Statistics ,Inferential Statistics through hypothesis tests Regression & ANOVA ,Regression ANOVA(Analysis of Variance)

UNIT-II: INTRODUCTION TO BIG DATA: Big Data and its Importance, Four V's of Big Data, Drivers for Big Data, Introduction to Big Data Analytics, Big Data Analytics applications. BIG DATA TECHNOLOGIES: Hadoop's Parallel World, Data discovery, Open source technology for Big Data Analytics, cloud and Big Data, Predictive Analytics, Mobile Business Intelligence and Big Data, Crowd Sourcing Analytics, Inter- and Trans-Firewall Analytics, Information Management.

UNIT-III: PROCESSING BIG DATA: Integrating disparate data stores, Mapping data to the programming framework, Connecting and extracting data from storage, Transforming data for processing, subdividing data in preparation for Hadoop Map Reduce.

UNIT-IV: HADOOP MAPREDUCE: Employing Hadoop Map Reduce, Creating the components of Hadoop Map Reduce jobs, Distributing data processing across server farms, Executing Hadoop Map Reduce jobs, monitoring the progress of job flows, The Building Blocks of Hadoop Map Reduce Distinguishing Hadoop daemons, Investigating the Hadoop Distributed File System Selecting appropriate execution modes: local, pseudo-distributed, fully distributed.

UNIT-V: BIG DATA TOOLS AND TECHNIQUES: Installing and Running Pig, Comparison with Databases, Pig Latin, User- Define Functions, Data Processing Operators, Installing and Running Hive, Hive QL, Querying Data, User-Defined Functions, Oracle Big Data.

Reference Books:

1. Michael Minelli, Michehe Chambers, "Big Data, Big Analytics: Emerging Business Intelligence and Analytic Trends for Today's Business", 1st Edition, Ambiga Dhiraj, Wiely CIO Series, 2013.

2. Arvind Sathi, "Big Data Analytics: Disruptive Technologies for Changing the Game", 1st Edition, IBM Corporation, 2012.

3. Rajaraman, A., Ullman, J. D., Mining of Massive Datasets, Cambridge University Press, United Kingdom, 2012.

4. Berman, J.J., Principles of Big Data: Preparing, Sharing and Analyzing Complex Information, Morgan Kaufmann, 2014

5. Barlow, M., Real-Time Big Data Analytics: Emerging Architecture, O Reilly, 2013

6. Schonberger, V.M. , Kenneth Cukier, K., Big Data, John Murray Publishers, 2013

7. Franks, "Taming the Big Data Tidal Wave: Finding Opportunities in Huge Data Streams with Advanced Analytics", 1st Edition, Wiley and SAS Business Series, 2012.

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD503 (B) Human Computer Interaction

Course Objectives: To provide the basic knowledge on the levels of interaction, design models, techniques and validations focusing on the different aspects of human-computer interface and interactions

Course Outcomes: After the completion of this course, the students will be able to:

1. Enumerate the basic concepts of human, computer interactions
2. Create the processes of human computer interaction life cycle
3. Analyze and design the various interaction design models
4. Apply the interface design standards / guidelines for evaluating the developed interactions
5. Apply product usability evaluations and testing methods

Unit I HCI Foundations: Input–output channels, Human memory, Thinking: reasoning and problem solving, Emotion, Individual differences, Psychology and the design of interactive systems, Text entry devices, Positioning, pointing and drawing, Display devices, Devices for virtual reality and 3D interaction, Physical controls, sensors and special devices, Paper: printing and scanning

Unit II Designing Interaction: Overview of Interaction Design Models, Discovery - Framework, Collection - Observation, Elicitation, Interpretation - Task Analysis, Storyboarding, Use Cases, Primary Stakeholder Profiles, Project Management Document

Unit III Interaction Design Models: Model Human Processor - Working Memory, Long-Term Memory, Processor Timing, Keyboard Level Model - Operators, Encoding Methods, Heuristics for M Operator Placement, What the Keyboard Level Model Does Not Model, Application of the Keyboard Level Model, GOMS - CMN-GOMS Analysis, Modeling Structure, State Transition Networks - Three-State Model, Glimpse Model, Physical Models, Fitts' Law

Unit IV Guidelines in HCI: Shneideman's eight golden rules, Norman's Sever principles, Norman's model of interaction, Nielsen's ten heuristics, Heuristic evaluation, contextual evaluation, Cognitive walk-through Collaboration and Communication: Face-to-face Communication, Conversation, Text-based Communication, Group working, Dialog design notations, Diagrammatic notations, Textual dialog notations, Dialog semantics, Dialog analysis and design

Unit V Human Factors and Security: Groupware, Meeting and decision support systems, Shared applications and artifacts, Frameworks for groupware Implementing synchronous groupware, Mixed, Augmented and Virtual Reality Validation: Validations - Usability testing, Interface Testing, User Acceptance Testing

References:

1. A Dix, Janet Finlay, G D Abowd, R Beale., Human-Computer Interaction, 3rd Edition, Pearson Publishers,2008
2. Shneiderman, Plaisant, Cohen and Jacobs, Designing the User Interface: Strategies for Effective Human Computer Interaction, 5th Edition, Pearson Publishers, 2010.
3. Hans-Jorg Bullinger," Human-Computer Interaction", Lawrence Erlbaum Associates, Publishers
4. Jakob Nielsen," Advances in Human-computer Interaction",Ablex Publishing Corporation
5. Thomas S. Huang," Real-Time Vision for Human-Computer Interaction", Springer
6. Preece et al, Human-Computer Interaction, Addison-Wesley, 1994

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD503(C) Pattern Recognition

Unit-I Introduction – Definitions, data sets for Pattern, Application Areas and Examples of pattern recognition, Design principles of pattern recognition system, Classification and clustering, supervised Learning, unsupervised learning and adaptation, Pattern recognition approaches, Decision Boundaries, Decision region , Metric spaces, distances.

Unit -II Classification: introduction, application of classification, types of classification, decision tree, naïve bayes, logistic regression , support vector machine, random forest, K Nearest Neighbour Classifier and variants, Efficient algorithms for nearest neighbour classification, Different Approaches to Prototype Selection, Combination of Classifiers, Training set, test set, standardization and normalization.

Unit – III Different Paradigms of Pattern Recognition, Representations of Patterns and Classes, Unsupervised Learning & Clustering: Criterion functions for clustering, Clustering Techniques: Iterative square -error partitional clustering – K means, hierarchical clustering, Cluster validation.

Unit -IV introduction of feature extraction and feature selection, types of feature extraction, Problem statement and Uses, Algorithms - Branch and bound algorithm, sequential forward / backward selection algorithms, (l,r) algorithm.

Unit -V Recent advances in Pattern Recognition, Structural PR, SVMs, FCM, Soft computing and Neuro-fuzzy techniques, and real-life examples, Histograms rules, Density Estimation, Nearest Neighbor Rule, Fuzzy classification.

Reference Books:

1. Richard O. Duda, Peter E. Hart and David G. Stork, “Pattern Classification”, 2nd Edition, John Wiley, 2006.

2. C. M. Bishop, “Pattern Recognition and Machine Learning”, Springer, 2009.

3. S. Theodoridis and K. Koutroumbas, “Pattern Recognition”, 4th Edition, academic Press, 2009.

4. Robert Schalkoff, “pattern Recognition: statistical, structural and neural approaches”, John Wiley and sons , Inc, 2007.

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD504 (A) Machine Learning

Unit I: Introduction to Artificial Intelligence and Neural Networks: Artificial Intelligence history, motivation and need of AI, goals and contribution of AI to modern technology, Neural network representation, Perceptron Learning, Training a Perceptron, Multilayer Perceptron, back propagation Algorithm, Training & Validation, Activation functions, Vanishing and Exploding Gradients.

Unit II: Introduction to Machine Learning, Machine learning life cycle, scope and limitations, Challenges of Machine learning, regression, probability, statistics and linear algebra for machine learning, Types of machine learning Models, data visualization, hypothesis function and testing, data distributions, data preprocessing, data augmentation, normalizing data sets, Relation between Artificial Intelligence, Machine Learning and Deep Learning.

Unit III: Supervised Learning Techniques: Linear Regression, Multiple Linear Regression, Polynomial Regression, Logistic Regression, Decision Tree Classification, K-Nearest Neighbors (K-NN), Support Vector Machine, Naive Bayes Algorithm, Performance Measures: Confusion Matrix, Classification Accuracy, Classification Report: Precisions, Recall, F1 score and Support.

Unit IV: Unsupervised and Reinforcement Learning Techniques: Types of Clustering Method: Partitioning Clustering, Distribution Model-Based Clustering, Hierarchical Clustering, Fuzzy Clustering, Reinforcement Learning Framework, MDP, Bellman equations, Value Iteration and Policy Iteration, Actor-critic model, Q-learning, SARSA.

Unit V: Dimensionality Reduction: The Curse of Dimensionality, Main Approaches for Dimensionality Reduction, Bias-Variance tradeoff, Subset Selection, Shrinkage Methods, L1 and L2 Regularization, Principle Components Analysis (PCA), Application of machine learning in computer vision, speech processing and natural language processing.

Reference Books:

1. Tom M. Mitchell, “Machine Learning”, McGraw Hill Education, First edition, 2017.
2. Russell, S. and Norvig N, “Artificial Intelligence: A Modern Approach”, Prentice Hall Series in Artificial Intelligence, 2003.
3. Pradhan and Kumar, “Machine Learning using Python”, Wiley India Publication, 2022.
4. Judith Hurwitz and Daniel Kirsch, “Machine learning for dummies”, IBM Limited edition.
5. Andreas, Muller C. and Guido S., “Introduction to Machine Learning with Python A guide for data scientists”, O'Reilly

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Computer Science and Design, V Semester

SD504 (B) Information Retrieval

UNIT-I: Introduction - History of IR- Components of IR - Issues -Open source Search engine Frameworks - The Impact of the web on IR - The role of artificial intelligence (AI) in IR – IR Versus Web Search - Components of a search engine, Characterizing the web.

UNIT –II: Boolean and Vector space retrieval models- Term weighting - TF-IDF weighting cosine similarity - Preprocessing - Inverted indices - efficient processing with sparse vectors Language Model based IR - Probabilistic IR -Latent Semantic indexing - Relevance feedback and query expansion.

UNIT- III: Web search overview, web structure the user paid placement search engine optimization, Web Search Architectures - crawling - meta-crawlers, Focused Crawling - web indexes- Near duplicate detection - Index Compression - XML retrieval.

UNIT –IV: Link Analysis -hubs and authorities - Page Rank and HITS algorithms -Searching and Ranking - Relevance Scoring and ranking for Web - Similarity - Hadoop & Map Reduce - Evaluation -Personalized search - Collaborative filtering and content-based recommendation of documents And products - handling invisible Web - Snippet generation, Summarization. Question Answering, Cross-Lingual Retrieval.

UNIT –V: Information filtering: organization and relevance feedback - Text Mining- Text classification and clustering - Categorization algorithms, naive Bayes, decision trees and nearest neighbor -Clustering algorithms: agglomerative clustering, k-means, expectation maximization (EM).

Reference Books:

1. C. Manning, P. Raghvan and H Schutze: Introduction to Information Retrieval, Cambridge University Press.

2. Ricardo Baeza Yates and Berthier Ribeiro Neto, Modern Information Retrieval :The Concepts and Technology behind Search, ACM Press Books.

3. Bruce Croft, Donald Metzler and Trevor Strohman, Search Engines Information Retrieval in Practice, Addison Wesley.

4.Mark Levene, An Introduction to Search Engines and Web Navigation, Wiley

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD504(C) Management Information System

UNIT-I Basic Concepts of MIS, Data v/s Information, Organization Structures, Business Process, Role of the MIS, Importance, Scope, Impact and Advantagesof the MIS, MIS: a support to management, Structure/Architecture of MIS, Classification of MIS based on information characteristics, application, and business function.

UNIT-II Resources and Components of Information Systems, Managing Information Resources in an Organization, IT infrastructure and upcoming technologies, Integration and automation of Business Functions and developing Business Models. Fundamentals of Data Processing.

UNIT-III Information System Development: SDLC, Models and approaches to System development, Information System Planning, System Analysis and Design- Need for System Analysis,Analysis of the existing system, Analysis of new requirements; System Development; System Implementation; Factors responsible for success and failure of Information Systems.

UNIT-IV Information System Applications: Business Applications, Decision Support Systems (DSS)-Characteristics, Problem Analysis v/s Decision making, DSS applications in E enterprise, Knowledge Management System and Knowledge Based Expert System, Enterprise Model System and E-Business, ERP systems, E-Commerce, E-communication; Business Process Reengineering.

UNIT-V Evaluation and Maintenance of MIS, Protecting the Information Systems- Security challenges in E-enterprises; Security threats, vulnerability, and safeguards, Controlling security threat and vulnerability, Technologies for Information SystemText Books Control, Disaster Recovery Plans. Emerging trends and technologies with regard to MIS.

Reference Books:

1. Jawadekar, W.S., "Management Information Systems", Tata McGraw Hill.
2. Kenneth C. Laudon and Jane P. Laudon: "Management Information Systems" ,Pearson Education.
3. Stephen Haag, M. Cummings, Donald J McCubbrey, "Management Information Systems for the Information Age", McGrawHill.
4. Goyal, D.P.: "Management Information System", Macmillan India.
5. MahadeoJaiswal, Monika Mital: "Management Information System", Oxford University Press.
6. Murthy C.S.V.: "Management Information System", Himalaya Publications

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Computer Science and Design, V Semester

SD505 Linux Lab

COURSE OUTCOMES:

After Completing the course student should be able to:

CO1. Understand the system calls.
CO2. Compare between ANSI C AND C++ AND POSIX standards.
CO3. Mapping the relationship between UNIX Kernel support for files.
CO4. Understand Kernel support for process creation and termination and memory allocation.

Overview of Unix/Linux:-Concepts, Unix/Linux Installation Process, Hardware requirements for Unix/Linux,Advantages of Unix/Linux, Reasons for Popularity and Success of Linux/Unix OperatingSystem, Features of Linux/Unix Operating System, Kernel, Kernel Functions

The Shell Basic Commands, Shell Programming:-Shell Variables, Branching Control Structures, Loop-Control Structure, Continue and breakStatements, Sleep Command, Debugging Script. Use of Linux as webserver,file server, directory server, application server, DNS server, SMTP server, Firewall,Proxy server.

File System: -Definition of File System, Defining Geometry, Disk Controller, Solaris File System, DiskBased File Systems, Network-Based File Systems, Virtual File systems, UFS File System,The Boot Block, The Super Block, The Inode, Tuning File System, Repairing File System.

Process Control:-Viewing a Process, Command to display Process, Process Attributes, Process States, ProcessFields, PS Commands options, PGREP, PRSTAT, CDE Process Manager, SchedulingProcess, Scheduling Priorities, Changing the Priority of a time-sharing process, KillingProcess.

System Security:-Physical Security, Controlling System Access, Restricted Shells Controlling File Access, FileAccess Commands, Access Control List(ACLs), Setting ACL Entries, Modifying ACLentries on a file, Deleting ACL entries on a file, Restricting FTP, Securing Super UserAccess, Restricting Root Access, Monitoring super user Access, TCP Wrappers.

Dynamic Host Configuration Protocol: -Introduction, DHCP Leased Time, DHCP Scopes, DHCP IP Address, Allocation Types,Planning DHCP Deployment, DHCP Configuration files, Automatic Startup of DHCPServer, Configuration of DHCP Clients, Manually Configuring the DHCP.

Case Study: -

Installation of Linux, Customization of Linux, Installation of SAMBA, APACHE,TOMCAT, Send MAIL, Postfix, Implementation of DNS, LDAP services, Firewall, Proxy Server

List of Experiments:-

1. To Study basic & User status Unix/Linux Commands.
2. Study & use of commands for performing arithmetic operations with Unix/Linux.
3. Create a file called wlcc.txt with some lines and display how many lines, words and characters are present in that file.
4. Append ten more simple lines to the wlcc.txt file created above and split the appended file into 3 parts. What will be the names of these split files? Display the contents of each of these files. How many lines will be there on the last file?
5. Given two files each of which contains names of students. Create a program to display only those names that are found on both the files.

6. Create a program to find out the inode number of any desired file.
7. Study & use of the Command for changing file permissions.
8. Write a pipeline of commands, which displays on the monitor as well as saves the information about the number of users using the system at present on a file called user.ux.
9. Execute shell commands through vi editor.
10. Installation, Configuration & Customizations of Linux.
11. Write a shell script that accepts any number of arguments and prints them in the reverse order.
12. Write a shell script to find the smallest of three numbers that are read from the keyboard.
13. Write a shell script that reports the logging in of a specified user within one minute after he/she logs in. The script automatically terminates if the specified user does not login during a specified period of time.
14. Installation of SAMBA, APACHE, TOMCAT.
15. Implementation of DNS, LDAP services,
16. Study and installation of Firewall & Proxy server.

Suggested Reading:

1. Venkatesh Murthy, "Introduction to Unix &Shell", Pearson Edu
2. Forouzan, "Unix &Shell Programming", Cengage Learning
3. Sumitab Das,"Unix Concept & Application",TMH
4. Gopalan, Shivaselvan,"Beginners Guide to Unix" PHI Learning
5. Venkateshwavle,"Linux Programming Tools Unveil`ed", BS Publication.
6. Richard Peterson,"Linux Complete Reference",TMH
7. Richard Peterson,"Unix Complete Reference",TMH

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New Scheme Based On AICTE Flexible Curricula

Computer Science and Design, V Semester

SD506 Machine Learning Using Python

Introduction to Machine Learning, Machine learning life cycle, scope and limitations, Challenges of Machine learning, Types of machine learning Models,
Functions related with mathematical operations, regression, probability, statistics and linear algebra for machine learning.

Data visualization, hypothesis function and testing, data distributions, data preprocessing, data augmentation, normalizing data sets.

Supervised Learning Techniques: Linear Regression, Multiple Linear Regression, Polynomial Regression, Logistic Regression, Decision Tree Classification, K-Nearest Neighbors (K-NN), Support Vector Machine, Naive Bayes Algorithm.

Performance Measures: Confusion Matrix, Classification Accuracy, Classification Report: Precisions, Recall, F1 score and Support.

Unsupervised Learning Techniques: Types of Clustering Method: Partitioning Clustering, Distribution Model-Based Clustering, Hierarchical Clustering, Fuzzy Clustering.

Reinforcement Learning Techniques: Actor-critic model, Q-learning, SARSA.

Dimensionality Reduction: The Curse of Dimensionality, Main Approaches for Dimensionality Reduction, Principle Components Analysis.

List of Experiments:

1. Perform various mathematical operations for machine learning.
2. Perform various operations on matrix for machine learning.
3. Perform various statistical operations for machine learning.
4. Write a Program to demonstrate Data Visualization.
5. Write a Program to demonstrate Linear Regression.
6. Write a Program to demonstrate Multiple Linear Regression.
7. Write a Program to demonstrate Polynomial Regression.
8. Write a Program to demonstrate Logistic Regression.
9. Write a Program to demonstrate Decision Tree Classification.
10. Write a Program to demonstrate K-NN Model.
11. Write a Program to demonstrate SVM Model.
12. Write a Program to demonstrate Naive Bayes Algorithm.

Reference Books:

1. Tom M. Mitchell, “Machine Learning”, McGraw Hill Education, First edition, 2017.
2. Pradhan and Kumar, “Machine Learning using Python”, Wiley India Publication, 2022.
3. Judith Hurwitz and Daniel Kirsch, “Machine learning for dummies”, IBM Limited edition.
4. Andreas, Muller C. and Guido S., “Introduction to Machine Learning with Python A guide for data scientists”, O'Reilly