

(CS423) SOFTWARE PROJECT MANAGEMENT

COURSE OBJECTIVES:

The students will be able to:

1. Prescribe the conventional and evolution of software.
2. Resolve the process of managing a software from conventional to modern.
3. Analyze the architecture of a model based software and the process flow.
4. Describe the process automation, process management and its discriminants.
5. Review the economics for the next generation software.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

- a) Develop the model from the conventional software product to the modern.
- b) Analyze and design the software architecture.
- c) Have an exposure for organizing and managing a software project.
- d) Apply, analyze, design and develop the software project.
- e) Design various estimation levels of cost and effort.
- f) Acquire the knowledge of managing, economics for conventional, modern and future software projects.
- g) Categorize various peer instruction levels.
- h) Sketch various artifacts sets for better understanding of software development.

Unit wise Learning Objectives:

UNIT- I

1. Prescribe the conventional and evolution of software.
2. Analyze the importance of improving software economics.
3. Evaluate budget for any small scale projects.
4. Describe the evolution of software economics.
5. Formulate various cost estimation models.

UNIT-II

1. Comprehend the process of managing software from conventional to modern.
2. Categorize different life cycle phases.
3. Analyse engineering and production stages.
4. Describe various artifact sets.
5. Apply, design & develop the software system process.

UNIT-III

1. Analyse the architecture of a model based software and the process flow
2. Describe various workflows.
3. Summarize the check points of the process.
4. Develop the WBS structure of any project.
5. Illustrate different process planning strategies.

UNIT-IV

1. Analyse the process automation, process management, and its discriminants.
2. Identify seven core metrics.
3. Formulate metric automation.
4. Describe the evolution of organization

UNIT-V

1. Establish modern project profile.
2. Plan and manage projects at each stage of the SDLC.
3. Estimate future technologies of managing software projects.
4. Analyse next generation software economics.

LESSON PLAN

Course Number : CS423
Program : B.Tech
Year / Semester : IV-I

Course Name : SPM
Branch : CSE
Section : A, B & C

| S.No | Topic | Proposed Date | Actual Date |
|------------------|---|--------------------------|-------------|
| UNIT – I | | | |
| 1 | Conventional Software Management : | 12/06/2017 | |
| 2 | The waterfall model | 13/06/2017 14/06/2017 | |
| 3 | Conventional software Management performance. | 16/06/2017 | |
| 4 | Evolution of Software Economics : | 19/06/2017 | |
| 5 | Software Economics | 19/06/2017 | |
| 6 | Pragmatic software cost estimation | 20/06/2017 | |
| 7 | Improving Software Economics : | 21/06/2017 | |
| 8 | Reducing Software product size | 23/06/2017 | |
| 9 | Improving Software Processes | 26/06/2017 | |
| 10 | Improving Team Effectiveness | 27/06/2017 | |
| 11 | Improving Automation | 28/06/2017 | |
| 12 | Achieving Required Quality | 30/06/2017 | |
| 13 | Peer Inspections. | 30/06/2017 | |
| UNIT – II | | | |
| 14 | The old way and the new : | 3/07/2017 | |
| 15 | The principles of conventional software Engineering | 3/07/2017 4/07/2017 | |
| 16 | Principles of modern software management | 5/07/2017 | |
| 17 | Transitioning to an iterative process. | 6/07/2017 | |
| 18 | Life cycle phases : | 7/07/2017 | |
| 19 | Engineering and production stages | 11/07/2017 | |
| 20 | Inception, Elaboration | 12/07/2017 14/07/2017 | |
| 21 | Construction, Transition phase | 17/07/2017 18/07/2017 | |

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| 22 | Artifacts of the process : | 19/07/2017 | |
| 23 | The artifact sets | 21/07/2017 | |
| 24 | Management Artifacts | 24/07/2017 | |
| 25 | Engineering Artifacts | 25/07/2017 | |
| 26 | Programmatic Artifacts. | 26/07/2017 | |
| UNIT – III | | | |
| 27 | Model based software architectures : | 28/07/2017 | |
| 28 | Management perspective and Technical perspective. | 31/07/2017 | |
| 29 | Work Flows of the process : | 01/08/2017 | |
| 30 | Software process workflows | 02/08/2017 04/08/2017 | |
| 31 | Iteration workflows | 07/08/2017 | |
| | I - Mid Examination | 08/08/2017 to 10/08/2017 | |
| 32 | Checkpoints of the process : | 11/08/2017 | |
| 33 | Major mile stones | 11/08/2017 | |
| 34 | Minor Milestones | 16/08/2017 | |
| 35 | Periodic status assessments | 16/08/2017 | |
| 36 | Iterative Process Planning : Work Breakdown Structures | 18/08/2017 | |
| 37 | Planning Guidelines | 21/08/2017 | |
| 38 | cost and schedule estimating | 22/08/2017 | |
| 39 | Iteration Planning Process and Pragmatic planning | 23/08/2017 | |
| UNIT – IV | | | |
| 40 | Project Organizations and Responsibilities : Line-of-Business Organizations | 28/08/2017 | |
| 41 | Project Organizations | 29/08/2017 | |
| 42 | Evolution of Organizations. | 30/08/2017 | |
| 43 | Process Automation : | 01/09/2017 | |
| 44 | Project Control and Process instrumentation : The seven core Metrics | 04/09/2017 | |
| 45 | Automation Building blocks | 05/09/2017 | |

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| 46 | Management indicators | 06/09/2017 | |
| 47 | Quality Indicators | 08/09/2017 | |
| 48 | Life Cycle Expectations | 11/09/2017 | |
| 49 | Pragmatic Software Metrics | 12/09/2017 | |
| 50 | Metrics Automation. | 13/09/2017 | |
| UNIT – V | | | |
| 51 | Tailoring the Process : Process Discriminants | 15/09/2017 18/09/2017 19/09/2017 | |
| 52 | Future Software Project Management : Modern Project Profiles | 22/09/2017 25/09/2017 | |
| 53 | Next generation Software economics | 26/09/2017 | |
| 54 | Modern Process Transitions. | 03/10/2017 | |
| 55 | Case Study : The Command Center Processing and Display System-Replacement (CCPDS-R) | 04/10/2017 06/10/2017 09/10/2017 | |
| | II - Mid Examination | 12/10/2017 to 16/10/2017 | |

TEXT BOOKS:

T1 Software Project Management, Walker Royce: Pearson Education, 2005.

REFERENCE BOOK:

R1 Software Project Management, Bob Hughes and Mike Cotterell: Tata McGraw-Hill Edition.

R2 Software Project Management, Joel Henry, Pearson Education.

R3 Software Project Management in practice, Pankaj Jalote, Pearson Education.2005.

Content beyond the syllabus:

1. The state of practice in software management.
2. The COCOMO cost estimation model.
3. Various sub system process improvements.
4. Core metrics like development progress, test progress, and stability.
5. Risk management in process overview.

(CS430) NETWORK SECURITY & CRYPTOGRAPHY**COURSE OBJECTIVES:**

The students will be able to:

1. Learn the basics of information security and different types of algorithms for providing security.
2. Procure knowledge of providing security for given data.
3. Concepts of cryptography techniques and crypt analysis techniques.
4. Different versions of viruses and antivirus.
5. Concepts of IP security and Web security

COURSE OUTCOMES:

At the end of the course, the student will be able to:

- a) Have an exposure to the different system attacks and viruses.
- b) Apply conventional and modern PKCs, design and develop efficient security systems.
- c) Design an effective intrusion detection systems and trusted systems through firewall architecture.
- d) Apply the protocols encapsulation, payload, SSL, TLS and SET to design and develop efficient online secure system.
- e) Identify some of the factors driving the need for network security.
- f) Should be able to write code for relevant cryptographic algorithms.
- g) Identify physical points of vulnerability in simple networks.
- h) Should be able to determine firewall requirements, and configure a firewall.

UNIT WISE LEARNING OBJECTIVES:**UNIT- I**

1. Examine the various security attacks.
2. Analyze the different hijacking attacks.
3. Understand the security machanisms and services.
4. Analyze the Internet Standards and RFCs.

UNIT- II

1. Analyze the principles of conventional encryption algorithms.
2. Understand the concepts of encryption algorithms.
3. Analyze approaches of Message Authentication.
4. Identify different attacks of encryption algorithms.

UNIT- III

1. Analyze the public key cryptography principles.
2. Understand the concepts of public key algorithms.
3. Examine the applications of public key algorithms.
4. Understand the concepts of Email privacy.

UNIT- IV

1. Understand the concepts of IP Security and Web Security.
2. Analyze the problems of SSL and TLS.
3. Examine the online transaction process (SET).
4. Understand the Key Management.

UNIT- V

1. Identify the basic concepts of SNMP.
2. Compare the difference between SNMP versions.
3. Analyze the difference between Intruder and viruses.
4. Understand the concepts of firewalls and Intrusion Detection System.

LESSON PLAN

Course Number : CS426 **Course Name:** Network security & Cryptography
Program : B.Tech **Branch** : CSE
Year / Semester : IV/ I **Section** : A

| S.No. | Topic | Proposed Date | Actual Date |
|-------------------|---|------------------------|-------------|
| UNIT – I | | | |
| 1 | Security Attacks (Interruption, Interception, Modification and Fabrication) | 12/6/2017 | |
| 2 | Security Services and Mechanisms | 13/6/2017 | |
| 3 | A model for Internetwork security | 14/6/2017 | |
| 4 | Internet Standards and RFCs | 16/6/2017 | |
| 5 | Buffer overflow & format string vulnerabilities | 17/6/2017 | |
| 6 | TCP session hijacking, ARP attacks, route table modification | 19/6/2017 20/6/2017 | |
| 7 | UDP hijacking, and man-in-the-middle attacks | 21/6/2017 | |
| UNIT - II | | | |
| 8 | Conventional Encryption Principles | 23/6/2017 | |
| 9 | Conventional encryption algorithms | 24/6/2017 28/6/2017 | |
| 10 | Conventional encryption algorithms | 30/6/2017 01/7/2017 | |
| 11 | cipher block modes of operation | 03/7/2017 | |
| 12 | location of encryption devices | 04/7/2017 | |
| 13 | key distribution | 05/7/2017 | |
| 14 | Approaches of Message Authentication, Secure Hash Functions | 07/7/2017 11/7/2017 | |
| 15 | HMAC | 12/7/2017 | |
| UNIT - III | | | |
| 16 | Public key cryptography principles | 14/7/2017 | |
| 17 | Public key cryptography algorithms | 15/7/2017 17/7/2017 | |
| 18 | Public key cryptography algorithms | 18/7/2017 19/7/2017 | |
| 19 | Digital signatures, digital Certificates. | 21/7/2017 | |

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| 20 | Certificate Authority and key management | 22/7/2017 | |
| 21 | Kerberos | 25/7/2017 26/7/2017 | |
| 22 | X.509 Directory Authentication Service | 28/7/2017 29/7/2017 | |
| 23 | Email privacy: Pretty Good Privacy (PGP) | 31/7/2017 01/8/2017 02/8/2017 | |
| 24 | S/MIME | 04/8/2017 05/8/2017 07/8/2017 | |
| I- Mid Examination | | | |
| UNIT - IV | | | |
| 25 | IP Security Overview | 11/8/2017 | |
| 26 | IP Security Architecture | 16/8/2017 | |
| 27 | Authentication Header, Encapsulating Security Payload | 18/8/2017 19/8/2017 21/8/2017 | |
| 28 | Combining Security Associations and Key Management | 22/8/2017 23/8/2017 26/8/2017 | |
| 29 | Web Security Requirements | 28/8/2017 29/8/2017 | |
| 30 | Secure Socket Layer (SSL) | 30/8/2017 24/8/2017 01/9/2017 | |
| 31 | Transport Layer Security (TLS) | 04/9/2017 05/9/2017 | |
| 32 | Secure Electronic Transaction (SET) | 06/9/2017 08/9/2017 | |
| UNIT - V | | | |
| 33 | Basic concepts of SNMP | 11/9/2017 12/9/2017 | |
| 34 | SNMPv1 Community facility | 13/9/2017 15/9/2017 16/9/2017 | |
| 35 | SNMPv3 | 18/9/2017 19/9/2017 22/9/2017 | |
| 36 | Intruders | 23/9/2017 25/9/2017 | |

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| 37 | Viruses and related threats | 26/9/2017 28/9/2017 | |
| 38 | Firewall Design principles | 03/10/2017 04/10/2017 06/10/2017 | |
| 39 | Trusted Systems | 07/10/2017 09/10/2017 | |
| 40 | Intrusion Detection Systems | 10/10/2017 11/10/2017 | |
| II- Mid Examination | | | |

TEXT BOOKS:

- T1** William Stallings , “Network Security Essentials (Applications and Standards)”, Pearson Education,ISBN:-10:0-13-610805-9
- T2** Stallings,”Cryptography and network Security”, Third Edition, PHI/Pearson,ISBN:10:0130914290

REFERENCE BOOK:

- R1** Whitman, “Principles of Information Security”, Thomson,ISBN:10:1111138214
- R2** Robert Bragg, Mark Rhodes, “Network Security: The complete reference”, TMH,ISBN:10:0072226978
.2005.

Content beyond the Syllabus:

1. Unit-I: Various Networks and the people involved in providing and attacking security.
2. Unit-II: Discussion of more transposition and substitution ciphers.
3. Unit-III: Importance of public key algorithms in real time applications.
4. Unit-IV: Use of SET, SSL and TLS in online services
5. Unit-V: Discussion of various modern Viruses and anti-Viruses.

(13CS424) DATA WAREHOUSING AND DATA MINING

COURSE OBJECTIVES:

1. To comprehend the basic principles, concepts and applications of data warehousing and data mining
2. To introduce the task of data mining as an important phase of knowledge discovery process.
3. Ability to do Conceptual, Logical, and Physical design of Data Warehouses OLAP applications and OLAP deployment
4. Analyze the concepts of classification, clustering and association rules for the OLAP technology.
5. Know in detail about data mining algorithms.

COURSE OUTCOMES:

1. Design a data mart or data warehouse for any organization
2. Develop skills to write queries using DMQL
3. Extract knowledge using data mining techniques
4. Adapt to new data mining tools.
5. Explore recent trends in data mining such as web mining, spatial-temporal mining
6. Describe the basic principles and algorithms used in practical data mining and Comprehend their strengths and weaknesses.
7. Apply data mining techniques to solve problems in other disciplines in a mathematical way;
8. Apply data mining methodologies with information systems

Unit wise Learning Objectives:

UNIT- I

1. Summarize the fundamentals of data mining.
2. Classify the data mining systems, data mining task primitives.
3. Infer integration of a data mining system with a database.
4. Express the need for preprocessing the data.
5. Explain discretization and concept hierarchy generation.

UNIT-II

1. Describe a Data warehouse.
2. Outline the data warehouse architecture.
3. Assemble a data warehouse.
4. Distinguish various data cube computation.
5. Infer the Attribute oriented induction.

UNIT-III

1. Infer frequent patterns, associations.
2. Analyze various kinds of association rules.
3. Express classification and prediction.
4. Model classification by DTI, Bayesian, rule based, back propagation.
5. Illustrate the accuracy of a classifier or a predictor.

UNIT-IV

1. Describe the data in cluster analysis.
2. Categorize the major clustering methods.
3. Identify time-series and sequence data.
4. Discover sequence patterns in transactional database.
5. Analyze patterns in biological data, graph mining.

UNIT-V

1. Recognise descriptive mining of complex data objects.
2. Distinguish spatial data mining, multimedia, text mining.
3. Discuss the applications and trends in data mining.
4. Illustrate data mining system products and research prototypes.
5. Infer the social impacts of data mining.

LESSON PLAN

Course Number :13CS428 **Course Name** :Data Warehousing and Data Mining
Program : B.Tech **Branch** : CSE
Year / Semester : IV/I **Section** : C

| S.No | Topic | Proposed Date | Actual Date |
|------------------|--|---------------|-------------|
| UNIT – I | | | |
| 1 | Introduction: Fundamentals of data mining, Data Mining Functionalities | 12-06-2017 | |
| 2 | Classification of Data Mining systems | 13-06-2017 | |
| 3 | Data Mining Task Primitives | 15-06-2017 | |
| 4 | Integration of a Data Mining System with a Database or a Data Warehouse System | 17-06-2017 | |
| 5 | Major issues in Data Mining. | 19-06-2017 | |
| 6 | Data Pre-processing: Need for Pre-processing the Data: Data Cleaning | 20-06-2017 | |
| 7 | Data Integration | 22-06-2017 | |
| 8 | Data Transformation | 24-06-2017 | |
| 9 | Data Reduction | 29-06-2017 | |
| 10 | Discretization and Concept Hierarchy Generation | 01-07-2017 | |
| UNIT – II | | | |
| 11 | Data Warehouse and OLAP Technology for Data Mining | 03-07-2017 | |
| 12 | Data Warehouse, Multidimensional Data Model | 04-07-2017 | |
| 13 | Data Warehouse Architecture, Data Warehouse Implementation | 06-07-2017 | |
| 14 | Further Development of Data Cube Technology | 11-07-2017 | |
| 15 | From Data Warehousing to Data Mining | 13-07-2017 | |
| 16 | Data Cube Computation and Data Generalization | 15-07-2017 | |
| 17 | Data Cube Computation and Data Generalization | 17-07-2017 | |
| 18 | Efficient Methods for Data Cube Computation | 18-07-2017 | |
| 19 | Efficient Methods for Data Cube Computation | 20-07-2017 | |
| 20 | Further Development of Data Cube and OLAP Technology | 22-07-2017 | |
| 21 | Further Development of Data Cube and OLAP Technology | 24-07-2017 | |

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| 22 | Attribute-Oriented Induction | 25-07-2017 | |
| | UNIT – III | | |
| 23 | Mining Frequent Patterns, Associations and Correlations | 27-07-2017 | |
| 24 | Basic Concepts, Efficient and Scalable Frequent Item set Mining Methods | 29-07-2017 | |
| 25 | Mining various kinds of Association Rules, From Association Mining to Correlation Analysis | 31-07-2017 | |
| 26 | Constraint-Based Association Mining | 01-08-2017 | |
| 27 | Classification and Prediction: Issues Regarding Classification and Prediction | 03-08-2017 | |
| 28 | Classification by Decision Tree Induction, Bayesian Classification | 05-08-2017 | |
| 29 | Rule-Based Classification, Classification by Back Propagation | 07-08-2017 | |
| 30 | Support Vector Machines, Associative Classification, Lazy Learners | 17-08-2017 | |
| 31 | Other Classification Methods, Prediction, Accuracy and Error measures, | 19-08-2017 | |
| 32 | Evaluating the accuracy of a Classifier or a Predictor, Ensemble Methods | 21-08-2017 | |
| | UNIT-IV | | |
| 33 | Cluster Analysis Introduction :Types of Data in Cluster Analysis | 22-08-2017 | |
| 34 | A Categorization of Major Clustering Methods | 24-08-2017 | |
| 35 | Partitioning Methods, Hierarchical Methods | 26-08-2017 | |
| 36 | Density-Based Methods, Grid-Based Methods | 28-08-2017 | |
| 37 | Model-Based Clustering Methods | 29-08-2017 | |
| 38 | Clustering High-Dimensional Data, Constraint-Based Cluster Analysis | 31-08-2017 | |
| 39 | Outlier Analysis - Mining Streams | 04-09-2017 | |
| 40 | Mining Time-Series Data, | 05-09-2017 | |
| 41 | Mining Sequence Patterns in Transactional Databases | 07-09-2017 | |
| 42 | Mining Sequence Patterns in Biological Data, Graph Mining | 11-09-2017 | |
| 43 | Social Network Analysis and Multirelational Data Mining | 12-09-2017 | |
| 44 | Case Study: Health Care Fraud Detection Analyzing Results | 14-09-2017 | |

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| 45 | Case Study: Health Care Fraud Detection Linking Techniques to Business Problems | 16-09-2017 | |
| | UNIT-V | | |
| 46 | Mining Object and Spatial data | 18-09-2017 | |
| 47 | Mining Multimedia, Text and Web Data | 19-09-2017 | |
| 48 | Multidimensional Analysis and Descriptive Mining of Complex Data Objects | 21-09-2017 | |
| 49 | Spatial Data Mining, Multimedia Data Mining | 23-09-2017 | |
| 50 | Text Mining | 25-09-2017 | |
| 51 | Mining the World Wide Web | 26-09-2017 | |
| 52 | Data Mining Applications | 03-10-2017 | |
| 53 | Data Mining System Products and Research Prototypes | 05-10-2017 | |
| 54 | Additional Themes on Data Mining and Social Impacts of Data Mining | 07-10-2017 | |
| 55 | Additional Themes on Data Mining | 09-10-2017 | |
| 56 | Social Impacts of Data Mining | 10-10-2017 | |

Text Books:

1. Jiawei Han & Micheline Kamber, "Data Mining – Concepts and Techniques", Morgan Kaufmann Publishers, 2nd Edition, 2006, ISBN:10:15586090161.
2. Pang-Ning Tan, Michael Steinbach and Vipin Kumar, "Introduction to Data Mining", Pearson education, ISBN:10:0321321367.

Reference Book:

1. Sam Aanhory and Dennis Murray, "Data Warehousing in the Real World", Pearson Edn Asia, ISBN:0-201-17519-3.
2. K.P.Soman, S.Diwakar,V.Ajay, "Insight into Data Mining", PHI, 2008, ISBN: 978-81-203-2897-6.

(13CS425) NETWORK PROGRAMMING

COURSE OBJECTIVES:

1. Understanding of networks using TCP-IP.
2. Understanding of client design and server design methods.
3. Networking applications using socket programming.
4. Understanding the design considerations in building network applications.
5. An in depth knowledge of sockets and the system calls needed to support network programming.
6. To understand the data exchange between two processes.

COURSE OUTCOMES:

At the end of the course, the student will be able to:

1. Know the connection establishment and termination.
2. Identify the different types of functions used to develop TCP client server application.
3. Know the different socket options and IO Multiplexing.
4. Design a network application host it in the Internet

UNIT WISE LEARNING OBJECTIVES:

UNIT- I

1. Understand the OSI layer architecture
2. Illustrate the TCP and UDP connections
3. Discuss socket structure
4. Explain result arguments
5. Define Byte ordering and manipulation function and related functions

UNIT-II

1. Discuss socket functions for TCP connection
2. Define concurrent servers
3. Explain Close function and related function
4. Design TCP client server application
5. Analyze Crashing and Rebooting of server host shutdown of server host

UNIT- III.

I/O Multiplexing and socket options:

1. Distinguish between different I/O models.
2. Define poll and select functions
3. Illustrate TCP Echo server, getsockopt and setsockopt functions
4. Implement I/O multiplexing using poll and select function
5. write socket states

UNIT-IV

1. Explain UDP
2. Write server function, lost datagram, summary of UDP example
3. Define DNS, gethost by Name functio
4. Illustrate, Resolver option,
5. Explain Function and IPV6 support, uname function, other networking information.

UNIT-V IPC:

1. Implement file locking and record locking
2. Define namespace
3. Distinguish between different IPC methods
4. List types of terminals.
5. Deine RPC

LESSON PLAN**Course Number : (13CS425)****Course Name : NP****Program : B. Tech****Branch : CSE****Year / Semester : IV / I****Section : C**

| S.No | Topic | Proposed Date | Actual Date |
|------|---|---------------|-------------|
| | UNIT – I | | |
| 1 | Introduction to Network Programming: OSI model | 12/06/2017 | |
| 2 | Unix standards | 13/06/2017 | |
| 3 | TCP and UDP | 15/06/2017 | |
| 4 | TCP connection establishment and Format | 16/06/2017 | |
| 5 | Buffer sizes and limitation | 17/06/2017 | |
| 6 | standard internet services | 19/06/2017 | |
| 7 | Protocol usage by common internet application | 20/06/2017 | |
| 8 | Sockets Address structures | 22/06/2017 | |
| 9 | value – result arguments | 23/06/2017 | |
| 10 | Byte ordering and manipulation function and related functions | 24/06/2017 | |
| | Content beyond the syllabus | 29/06/2017 | |
| | Case study on network layer architecture | 30/06/2017 | |
| | UNIT-II | | |
| 11 | Elementary TCP sockets | 01/07/2017 | |
| 12 | Socket, connect, bind | 03/07/2017 | |
| 13 | listen, accept, fork and exec function | 04/07/2017 | |
| 14 | concurrent servers | 06/07/2017 | |
| 15 | Close function and related function | 07/07/2017 | |
| 16 | TCP client server: Introduction | 11/07/2017 | |
| 17 | TCP Echo server functions | 13/07/2017 | |
| 18 | Normal startup | 14/07/2017 | |
| 19 | terminate and signal handling server process termination | 15/07/2017 | |

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| 20 | Crashing and Rebooting of server host shutdown of server host | 17/07/2017 | |
| | Content beyond the syllabus | 18/06/2017 | |
| | Design client server communication | 20/07/2017 | |
| 21 | I/O Multiplexing and socket options | 21/07/2017 | |
| 22 | I/O Models, select function | 22/07/2017 | |
| 23 | Batch input, shutdown function | 24/07/2017 | |
| 24 | poll function | 25/07/2017 | |
| | Content beyond the syllabus | 27/07/2017 | |
| | Design the client server communication using poll and select function | 28/07/2017 | |
| | UNIT-III | | |
| 25 | TCP Echo server | 29/07/2017 | |
| 26 | getsockopt and setsockopt functions | 31/07/2017 | |
| 27 | Socket states | 01/08/2017 | |
| 28 | Generic socket option IPV6 socket option, ICMPV6 socket option IPV6 socket option and TCP socket options | 03/08/2017 | |
| | Content beyond the syllabus | 04/08/2017 | |
| | Design client server communication using TCP | 05/08/2017 | |
| | UNIT-IV | | |
| 29 | Elementary UDP sockets | 07/08/2017 | |
| 30 | Introduction UDP Echo server function | 11/08/2017 | |
| 31 | lost datagram | 17/08/2017 | |
| 32 | summary of UDP example | 18/08/2017 | |
| 33 | Lack of flow control with UDP | 19/08/2017 | |
| 34 | determining outgoing interface with UDP | 21/08/2017 | |
| 35 | Elementary name and Address conversions: | 22/08/2017 | |
| 36 | DNS | 24/08/2017 | |
| 37 | gethost by Name function | 26/08/2017 | |
| 38 | Resolver option | 28/08/2017 | |
| 39 | Function and IPV6 support | 29/08/2017 | |

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| 40 | uname function | 31/08/2017 | |
| 41 | other networking information | 01/09/2017 | |
| | Content beyond the syllabus | 04/09/2017 | |
| | Design client server communication using UDP | 05/09/2017 | |
| | UNIT-V | | |
| 42 | IPC: Introduction, File and record locking | 07/09/2017 | |
| 43 | Pipes, FIFOs streams and messages | 08/09/2017 | |
| 44 | Name spaces, system IPC | 11/09/2017 | |
| 45 | Message queues, Semaphores. | 12/09/2017 | |
| 46 | Remote Login: Terminal line disciplines, | 14/09/2017 | |
| 47 | Pseudo-Terminals, Terminal modes | 15/09/2017 | |
| 48 | Control Terminals | 16/09/2017 | |
| 49 | rlogin Overview | 18/09/2017 | |
| 50 | RPC Transparency Issues | 19/09/2017 | |
| | Content beyond the syllabus | 21/09/2017 | |
| | Design client server communication using different IPC methods | 22/09/2017 | |

TEXT BOOKS:

1. W.Richard Stevens, "UNIX Network Programming", Vol. I, Sockets API, 2nd Edition, Pearson Edn. Asia.
2. W.Richard Stevens, "UNIX Network Programming", 1st Edition, PHI.

REFERENCE BOOK:

1. T CHAN, "UNIX Systems Programming using C++", PHI.
2. Graham GLASS, King abls,"UNIX for Programmers and Users", 3rd Edition Pearson Education.

(13CS428A) MOBILE APPLICATION DEVELOPMENT

COURSE OBJECTIVES:

Student will be able to :

1. To learn about the technologies associating with wireless and PDA's
2. To acquire the knowledge on connection oriented protocols and communication management.
3. To know about the framework and managing a session
4. To design the records effectively, that can be managed in a system.
5. To know about the architecture and the programming principles for MIDlet.

COURSE OUTCOMES:

At the end of course, students will be able to

1. Design and develop PDA's applications.
2. Analyze the J2ME architecture for the development of application environment
3. Design effective RMS for mobile application
4. Analyze the Hypertext Transfer Protocol
5. Construct database table
6. Analyze the Session management
7. Analyze the design issues of user interfaces
8. Design the records effectively, that can be managed in a system.

Unit wise Learning Objectives:

UNIT- I

1. Recall the features of java
2. Outline J2me architecture.
3. Indentify small computing devices.
4. Analyze the technologies associated with wireless &pda's
5. Compare j2me and j2se.

UNIT-II

1. Summarize the configuration and profile.
2. Explain MIDlet , describes its lifecycle.
3. Develop a MIDlet Application
4. Configure a proper environment for development of a j2me application.
5. Summarize j2me best practices and patterns

UNIT-III

1. Analyze palm os emulator.
2. Examine command and item class .
3. Explain form class and , list class and canvas.
4. Estimate code size and memory usage.
5. Design j2me user interfaces.

UNIT-IV

1. Design the records effectively ,that can be managed in system.
2. Analyze JDBC packages.
3. List out jdbc drivers.
4. Memorize data definition language and data manipulate language.
5. Design sql queries

UNIT-V

1. Use Bluetooth or other n/w technology in order to communicate.
2. Evaluate mobile services regarding performance and security.
3. Create HTTP connections and manage sessions.
4. Summarize the connection oriented protocols.
5. Analyze communication management & session management.

LESSON PLAN

Course Number : 13CS428A **Course Name:** Mobile Application Development
Program : B.Tech **Branch** : CSE
Year / Semester : IV/I **Section** :

| S.No. | Topic | Proposed Date | Actual Date |
|-------------------|--|----------------------|--------------------|
| UNIT – I | | | |
| 1 | J2ME Overview: Java 2 Micro Edition and the World of Java, | 14-6-2017 | |
| 2 | Inside J2ME, J2ME and Wireless Devices | 17-6-17 | |
| 3 | Small Computing Technology: Wireless Technology, Radio Data Networks, | 21-6-17 | |
| 4 | Microwave Technology, Mobile Radio Networks | 24-6-17 | |
| 5 | Messaging, Personal Digital Assistants | 29-6-17 | |
| UNIT – II | | | |
| 1 | J2ME Architecture and Development Environment: J2ME Architecture | 4-7-17 | |
| 2 | Small Computing Device Requirements | 5-7-17 | |
| 3 | Run-Time Environment, MIDlet Programming, | 11-7-17 | |
| 4 | Java Language for J2ME, J2ME Software Development Kits | 13-7-17 | |
| 5 | Hello World J2ME Style, | 15-7-17 | |
| 6 | Multiple MIDlets in a MIDlet Suite | 19-7-17 | |
| 7 | J2ME Wireless Toolkit | 22-7-17 | |
| 8 | J2ME Best Practices and Patterns: The Reality of Working in a J2ME World, Best Practices | 25-7-17 | |
| UNIT – III | | | |
| 1 | Commands, Items, Event Processing: J2ME User Interfaces, | 29-7-17 | |
| 2 | Display Class, the Palm OS Emulator, | 1-8-17 | |
| 3 | Command Class, Item Class, | 2-8-17 | |
| 4 | Exception Handling | 3-8-17 | |

| | | | |
|-----------|--|----------|--|
| 5 | High-Level Display: Screens: Screen Class, | 5-8-17 | |
| | I- Mid Examination | | |
| 6 | Alert Class, Form Class, | 17-8-17 | |
| 7 | Item Class, List Class, Text Box Class, Ticker Class | 22-8-17 | |
| 8 | Low-Level Display: Canvas: The Canvas, | 24-8-17 | |
| 9 | User Interactions, Graphics, | 29-8-17 | |
| 10 | Clipping Regions, Animation | 31-8-17 | |
| | UNIT – IV | | |
| 1 | Record Management System: Record Storage, Writing and Reading Records | 6-9-17 | |
| 2 | Record Enumeration, Sorting Records, Searching Records | 12-9-17 | |
| 3 | Record Listener JDBC Objects: The Concept of JDBC, JDBC Driver Types, JDBC Packages | 14-9-17 | |
| 4 | Overview of the JDBC Process, Database Connection, statement Objects, Result set | 16-9-17 | |
| 5 | Transaction Processing, Metadata, Data Types, Exceptions | 19-9-17 | |
| 6 | JDBC and Embedded SQL: Model Programs, Tables, Indexing, Inserting Data into Tables, | | |
| 7 | Selecting Data from a Table, Metadata, Updating Tables, Deleting Data form a Table, | 21-9-17 | |
| 8 | Joining Tables, Calculating Data, Grouping and Ordering Data | 23-9-17 | |
| 9 | Sub queries, VIEWS | 26-9-17 | |
| | UNIT – V | | |
| 1 | Generic Connection Framework: The Connection, Hypertext Transfer Protocol | 3-10-17 | |
| 2 | Communication Management Using HTTP Commands | 5-10-17 | |
| 3 | Session Management | 7-10-17 | |
| 4 | Transmits as a Background Process. | 11-10-17 | |
| | II- Mid Examination | | |

TEXT BOOK:

1. James Keogh: J2ME The Complete Reference (TMH)
2. Michael Juntao Yuan “Enterprise J2ME “ Developing Mobile java Application” PEARSON Education

(13CS132) DESIGN PATTERNS**COURSE OBJECTIVES:**

1. Learn how to apply a fundamental set of design patterns utilizing object oriented principles to solve real world software design problems.
2. To learn about the user interfaces, standards of designing a document editor.
3. To understand the Creational, Structural and Behavioral Patterns and explain how each pattern participants collaborate to carry out their responsibilities.
4. List the consequences of applying each pattern to the overall software quality of a system.
5. Implement the pattern in java or c# to a real world problem.

COURSE OUTCOMES:

1. Apply formal notations of C++, design and develop pattern of user choice.
2. Design a pattern or software which is the blueprint of the software system.
3. Accomplish UI and design an efficient editor.
4. Develop tools which make the more effective with the help of design patterns.
5. Determine the prototypes, abstract factory to design and develop catalog Pattern.
6. Develop frameworks using structural, creational and behavioral patterns to make design-reuse.
7. Develop structural, Creational and behavioral patterns and use them to give effective software solutions.
8. Appreciate the benefits of a patterns approach to programming design.

UNIT WISE LEARNING OBJECTIVES:**UNIT- I**

1. Learn importance of Design Patterns.
2. List the catalog of design patterns.
3. Understand how the design patterns solve the design problems.
4. Explain how to select a design pattern suitable for the design problem.
5. Understand how to use a design pattern.

UNIT-II

1. Understand the problems in designing a document editor.
2. List the 7 design problems of Lexi's editor.
3. Understand how those problems are solved using the design patterns.
4. Understand various principles and strategies of design patterns.
5. Explain what specific object oriented design problem the pattern solves.

UNIT-III

1. Explain the purpose of creational patterns.
2. Demonstrate the applicability of various creational patterns using case study.
3. Apply object-oriented methods to implement the patterns.
4. Differentiate between creational and structural patterns.
5. Analyze a software development problem and express its essence succinctly and precisely

UNIT-IV

1. Summarize the advantages of various structural patterns.
2. Differentiate between structural and behavioral patterns.
3. Design programs and implement on well known design patterns.

4. Understand the intent and applicability of behavioral patterns.
5. Given a problem, select an applicable design pattern or patterns

UNIT-V

1. Provide a specific context for each pattern in which it can be applied.
2. 3. Explain how the different components of the pattern collaborate with each other.
3. List the consequences of applying each pattern to the overall software quality of a system.
4. List which patterns are related to this pattern and what type pattern each pattern is .
5. Implement this pattern in Java or C# to a real world problem

LESSON PLAN**Course Number** : CS132**Course Name** : Design Patterns**Program** : B.Tech**Branch** : C.S.E**Year / Semester** : IV/I**Section** :

| S.No | Topic | Proposed Date | Actual Date |
|------|---|--------------------------|-------------|
| | UNIT-I | | |
| 1 | Introduction to design patterns | 15-06-2017 | |
| 2 | What Is a Design Pattern? | 16-06-2017 17-06-2017 | |
| 3 | Design Patterns in Smalltalk MVC | 22-06-2017 23-06-2017 | |
| 4 | Describing Design Patterns | 29-06-2017 | |
| 5 | The Catalog of Design Patterns | 30-06-2017 | |
| 6 | Organizing the Catalog, How Design Patterns Solve Design Problems | 05-07-2017 | |
| 7 | How to Select a Design Pattern | 06-07-2017 | |
| 8 | How to Use a Design Pattern. | 07-07-2017 08-07-2017 | |
| | Contents Beyond the syllabus | | |
| | Introduction to software development | 12-07-2017 | |
| | UNIT-II | | |
| 9 | A Case Study : Designing a Document Editor | 13-07-2017 14-07-2017 | |
| 10 | Design Problems | 15-07-2017 | |
| 11 | Document Structure | 19-07-2017 | |
| 12 | Formatting | 20-07-2017 21-07-2017 | |
| 13 | Embellishing the User Interface | 22-07-2017 26-07-2017 | |
| 14 | Supporting Multiple Look-and-Feel Standards | | |
| 15 | Supporting Multiple Window Systems | 27-07-2017 | |
| 16 | User Operations Spelling Checking and Hyphenation | 28-07-2017 | |
| | Contents Beyond the syllabus | | |
| | Principles and strategies of Design Patterns | 31-07-2017 | |
| | UNIT-III | | |

| | | | |
|----|--|--------------------------------|--|
| | Creational Patterns | | |
| 17 | Abstract Factory | 02-08-2017 | |
| 18 | Builder | 03-08-2017 04-08-2017 | |
| 19 | Factory Method | 05-08-2017 | |
| | I MID EXAMINATION | 08-08-2017 To 10-08-2017 | |
| 20 | Prototype | 11-08-2017 16-08-2017 | |
| 21 | Singleton | 17-08-2017 18-08-2017 | |
| 22 | Discussion of Creational Patterns. | 19-08-2017 23-08-2017 | |
| 23 | Structural Pattern Part-1 | 24-08-2017 | |
| 24 | Adapter | 26-08-2017 | |
| 25 | Bridge | 30-08-2017 31-08-2017 | |
| 26 | Composite | 01-09-2017 06-09-2017 | |
| 27 | Decorator | 07-09-2017 08-09-2017 | |
| | Contents Beyond the syllabus | | |
| | Applying Singleton Pattern to the case study | 09-09-2017 | |
| | UNIT-IV | | |
| 28 | Structural Pattern Part-II | 13-09-2017 | |
| 29 | Facade | 14-09-2017 | |
| 30 | Flyweight | 15-09-2017 | |
| 31 | Proxy | 16-09-2017 | |
| 32 | Discuss of Structural Patterns | 20-09-2017 | |
| 33 | Behavioral Patterns Part-I | 21-09-2017 | |
| 34 | Chain of Responsibility. | 21-09-2017 | |
| 35 | Command | 22-09-2017 | |
| 36 | Interpreter | 22-09-2017 | |

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|----|--|--------------------------------|--|
| | Contents Beyond the syllabus | | |
| | Applying the chain of responsibility pattern to the case study | 23-09-2017 | |
| | UNIT-V | | |
| 37 | Behavioral Patterns Part-II | 04-10-2017 | |
| 38 | Mediator | 04-10-2017 | |
| 39 | Memento | 05-10-2017 | |
| 40 | Observer | 05-10-2017 | |
| 41 | State | 06-10-2017 | |
| 42 | Strategy | 06-10-2017 | |
| 43 | Template Method | 07-10-2017 | |
| 44 | Visitor | 07-10-2017 | |
| 45 | Discussion of Behavioral Patterns | 11-10-2017 | |
| 46 | Expectations from Design Patterns | 11-10-2017 | |
| | Contents Beyond the syllabus | | |
| | Applying Template Method to the case study | 11-10-2017 | |
| | II MID EXAMINATION | 12-10-2017 To 16-10-2017 | |

TEXT BOOKS:

1. Gamma, Helm, Johnson, "Design Patterns: Elements of Reusable Object Oriented Software", 1995, Pearson Education ISBN:10:0201633612
2. Eric Freeman, "Head First Design Patterns", O'Reilly-SPD, ISBN:10:0596007124

REFERENCE BOOKS:

1. Cooper, "Java Design Patterns", Pearson Education, ISBN:6201-48539-7
2. Horstmann, "Object Oriented Design and Patterns", Wiley, ISBN:10:0471744875

WEB LINKS:

1. shop.oreilly.com/product/9780596007126.do
2. www.amazon.com/Design-Patterns-Elements.../dp/0201633612

(13CS427C) DISTRIBUTED SYSTEMS
(Elective-I)

COURSE OBJECTIVES:

1. To understand the components of Distributed Systems.
2. To learn about the Synchronization and fault tolerance of distributed systems.
3. To understand the design and implementation of different distributed file systems.
4. To know the Memory Management systems of Distributed File Systems.
5. To understand the different case studies of Distributed Systems.
6. To understand the design and usage of distributed file systems in the real world.

COURSE OUTCOMES:

The students will be able to

1. Apply, analyze and design effective distributed system.
2. Accomplish the fault and its tolerance.
3. Design the distributed file systems through shared variable, object based and bus based multi processors.
4. Have an exposure of differentiating the file systems in the real world.

UNIT WISE LEARNING OBJECTIVES:

UNIT- I

1. Discuss the goals of distributed systems.
2. Develop software prototypes applying variety of distributed system architectures.
3. Define, recognize and distinguish various types of communication (synchronous, asynchronous, persistent, and transient).
4. Identify different layers of protocols used in distributed systems.
5. Outline the steps of remote procedure call (RPC).

UNIT-II

1. Develop multi-threaded software that applies thread synchronization functionality.
2. Discuss the operations of logical clocks.
3. Identify starvation and deadlocks in distributed systems.
4. Understand the processes and threads in distributed systems.
5. Exemplify processor allocation and scheduling fault tolerance.

UNIT-III

1. Identify the architectures for distributed file.
2. Utilize appropriate protocol for communication in distributed file systems.
3. Explain the concept of naming in distributed file systems.
4. Discuss synchronization in distributed file systems.
5. Understand caching and replication in distributed files systems.

UNIT-IV

1. Identify design issues in distributed shared memory.
2. Understand the different multiprocessors used in distributed systems.
3. Compare different shared memory.
4. Discuss different consistency models.
5. Explain page based distributed shared memory.

UNIT-V

1. Identify issues in shard variable DSM.
2. Discuss issues in object based DSM.
3. Understand the case study: MACH.
4. Understand the case study: CHORUS.

LESSON PLAN

Course Number : 13CS427C
Program : B.Tech
Year / Semester : IV / I

Course Name : DS
Branch : CSE
Section : A,B & C

| S.No. | Topic | Proposed Date | Actual Date |
|-------|---|---------------|-------------|
| | UNIT – I | | |
| 1 | Introduction to Distributed Systems: Distributed systems: Goals, Hardware Concepts | 14/06/17 | |
| 2 | Software concepts | 21/06/17 | |
| 3 | Communication in distributed systems: Layered Protocol | 22/06/17 | |
| 4 | ATM Networks, client server model | 24/06/17 | |
| 5 | remote procedure call - group communication | 01/07/17 | |
| | Content beyond the syllabus | | |
| | | | |
| | UNIT – II | | |
| 1 | Synchronization: Clock synchronization - mutual exclusion | 07/07/17 | |
| 2 | election atomic transactions - dead locks | 13/07/17 | |
| 3 | Process and Processors: Threads - System models processor allocation | 19/07/17 | |
| 4 | scheduling fault tolerance | 26/07/17 | |
| | Content beyond the syllabus | | |
| | | | |
| | UNIT – III | | |
| 1 | Real time distributed systems | 02/08/17 | |
| 2 | Distributed file systems: File system design and implementation | 04/08/17 | |
| | I- Mid Examination | | |
| 3 | trends in distributed file systems | 18/08/17 | |
| | Content beyond the syllabus | | |
| | | | |

| UNIT – IV | | | |
|----------------------------|---|----------|--|
| 1 | Shared Memory: Introduction - bus based multi processors | 23/08/17 | |
| 2 | ring based multiprocessors, switched. Multiprocessors | 26/08/17 | |
| 3 | NUMA comparison of shared memory systems | 01/09/17 | |
| 4 | consistency models - page based distributed shared memory | 08/09/17 | |
| | Content beyond the syllabus | | |
| | | | |
| | | | |
| UNIT – V | | | |
| 1 | Shared variable distributed shared memory | 16/09/17 | |
| 2 | object based distributed shared memory | 23/09/17 | |
| 3 | Case studies: MACH and CHORUS | 06/10/17 | |
| | Content beyond the syllabus | | |
| | | | |
| | | | |
| II- Mid Examination | | | |

TEXT BOOKS:

1. Andrew S.Tanenbaum: “Distributed Operating System”, Prentice Hall International Inc.1995,ISBN:0-13-031358-0
2. George Coulouris, Jean Dollimore and Tim Kindberg “Distributed Systems: Concepts and Design” edition – Wesley Pearson Education 2001,ISBN:-10:0273760599

REFERENCE BOOKS

1. George Coulouris , Jean, Dollimore Tim Kindberg), Gordon Blair, “ Distributed Systems: Concepts and Design” (5th Edition) ,edition – Wesley 2011,ISBN:10:0132143011
2. Paolo Sivilotti,” Introduction to Distributed Systems”, 2005,ISBN:0321349601

WEB LINKS:

1. http://www.gmr.it/resources/syllabus_mca.pdf
2. books.google.co.in/books?isbn=3540401962.

(13CS424) DATA WAREHOUSING DATA MINING LAB**COURSE OBJECTIVES:**

The students will be able to:

1. To acquire the knowledge to implement the credit risk management.
2. To know the Construction of Data warehouse.
3. To learn the different mining procedures to retrieve the data from the database.
4. To understand the usage of tools relating to data mining and warehousing.
5. To learn about the DataMarts and its identification.
6. To acquire the skills on classification, association rules and their implementation.

COURSE OUTCOMES:

At the end of the course, Student will be able to:

1. Design and develop data warehouse
2. Exposure on various mining tools
3. Apply OLAP Technology for retrieval of data
4. Apply, design and develop real world data warehousing and mining applications.

Task 1: Credit Risk Assessment**Description:**

The business of banks is making loans. Assessing the credit worthiness of an applicant is of crucial importance. You have to develop a system to help a loan officer decide whether the credit of a customer is good, or bad. A bank's business rules regarding loans must consider two opposing factors. On the one hand, a bank wants to make as many loans as possible. Interest on these loans is the bank's profit source. On the other hand, a bank cannot afford to make too many bad loans. Too many bad loans could lead to the collapse of the bank. The bank's loan policy must involve a compromise: not too strict, and not too lenient.

To do the assignment, you first and foremost need some knowledge about the world of credit. You can acquire such knowledge in a number of ways. 1. Knowledge Engineering. Find a loan officer who is willing to talk. Interview her and try to represent her knowledge in the form of production rules. 2. Books. Find some training manuals for loan officers or perhaps a suitable textbook on finance. Translate this knowledge from text form to production rule form. 3. Common sense. Imagine yourself as a loan officer and make up reasonable rules which can be used to judge the credit worthiness of a loan applicant. 4. Case histories. Find records of actual cases where competent loan officers correctly judged when, and when not to, approve a loan application.

The German Credit Data: Actual historical credit data is not always easy to come by because of confidentiality rules. Here is one such dataset, consisting of 1000 actual cases collected in Germany. credit dataset (original) Excel spreadsheet version of the German credit data. In spite of the fact that the data is German, you should probably make use of it for this assignment. (Unless you really can consult a real loan officer !)

A few notes on the German dataset • DM stands for Deutsche Mark, the unit of currency, worth about 90 cents Canadian (but looks and acts like a quarter). • owns_telephone. German phone rates are much higher than in Canada so fewer people own telephones. • foreign_worker. There

are millions of these in Germany (many from Turkey). It is very hard to get German citizenship if you were not born of German parents. • There are 20 attributes used in judging a loan applicant. The goal is to classify the applicant into one of two categories, good or bad.

Subtasks : (Turn in your answers to the following tasks)

1. List all the categorical (or nominal) attributes and the real-valued attributes separately. (5 marks)
2. What attributes do you think might be crucial in making the credit assessment? Come up with some simple rules in plain English using your selected attributes. (5 marks)
3. One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training. (10 marks)
4. Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly? (This is also called testing on the training set) Why do you think you cannot get 100 % training accuracy? (10 marks)
5. Is testing on the training set as you did above a good idea? Why or Why not? (10 marks)
6. One approach for solving the problem encountered in the previous question is using cross-validation? Describe what is cross-validation briefly. Train a Decision Tree again using cross-validation and report your results. Does your accuracy increase/decrease? Why? (10 marks)
7. Check to see if the data shows a bias against "foreign workers" (attribute 20), or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss. (10 marks)
8. Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.) (10 marks)
9. Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifications equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 (using equal cost)? (10 marks)
10. Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees? How does the complexity of a Decision Tree relate to the bias of the model? (10 marks)
11. You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain? Also, report your accuracy using the pruned model. Does your accuracy increase? (10 marks)
12. (Extra Credit): How can you convert a Decision Tree into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also

exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset ? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR. (10 marks)

Task Resources:

- Mentor lecture on Decision Trees
- Andrew Moore's Data Mining Tutorials (See tutorials on Decision Trees and Cross

Validation)

- Decision Trees (Source: Tan, MSU)
- Tom Mitchell's book slides (See slides on Concept Learning and Decision Trees)
- Weka resources:
 - o Introduction to Weka (html version) (download ppt version)
 - o Download Weka
 - o Weka Tutorial
 - o ARFF format
 - o Using Weka from command line

Task 2: Hospital Management System

Data Warehouse consists Dimension Table and Fact Table.

REMEMBER The following

Dimension

The dimension object (Dimension):

- _ Name
- _ Attributes (Levels) , with one primary key
- _ Hierarchies

One time dimension is must. About Levels and Hierarchies Dimension objects (dimension) consist of a set of levels and a set of hierarchies defined over those levels. The levels represent levels of aggregation. Hierarchies describe parent-child relationships among a set of levels. For example, a typical calendar dimension could contain five levels. Two hierarchies can be defined on these levels:

H1: YearL > QuarterL > MonthL > WeekL > DayL

H2: YearL > WeekL > DayL

The hierarchies are described from parent to child, so that Year is the parent of Quarter, Quarter the parent of Month, and so forth.

About Unique Key Constraints

When you create a definition for a hierarchy, Warehouse Builder creates an identifier key for each level of the hierarchy and a unique key constraint on the lowest level (Base Level)

Design a Hospital Management system data warehouse (TARGET) consists of Dimensions Patient, Medicine, Supplier, Time. Where measures are ' NO UNITS', UNIT PRICE.

Assume the Relational database (SOURCE) table schemas as follows

TIME (day, month, year),

PATIENT (patient_name, Age, Address, etc.,)

MEDICINE (Medicine_Brand_name, Drug_name, Supplier, no_units, Uunit_Price, etc.,)

SUPPLIER :(Supplier_name, Medicine_Brand_name, Address, etc.,)

If each Dimension has 6 levels, decide the levels and hierarchies, Assume the level names suitably.

Design the Hospital Management system data warehouse using all schemas. Give the example 4-D cube with assumption names.

Embedded Systems:

- 1.To blink LED`s by taking an input from a switch
- 2.To perform serial data communication
- 3.To interface 8051 with a LCD
- 4.To perform keyboard interfacing
- 5.Interface SSD to the 8051 microcontroller
- 6.To interface the 8051 with ADC and DAC chips

REFERENCE BOOKS:

1. Jiawei Han and Micheline Kamber, “Data Mining – Concepts and Techniques”, Morgan Kaufmann Publishers, 2nd Edition, 2006,ISBN:10:0123814790
2. Sam Aanhory and Dennis Murray, “Data Warehousing in the Real World”, Pearson Edn Asia,ISBN:8131704599

WEB LINKS:

1. <http://nptel.iitm.ac.in>
2. books.google.co.in › Computers › Database Management › General.

LESSON PLAN**Course Number:**13CS424**CourseName:** DWDM LAB**Program:** B.Tech**Branch** : CSE**Year/Semester:** IV / I

| Week | Task | Date DD/MM/YYYY |
|-------------|--|----------------------------|
| | Credit Risk Assessment | |
| 1 | List all the categorical (or nominal) attributes and the real-valued attributes separately. What attributes do you think might be crucial in making the credit assesment ? Come up with some simple rules in plain English using your selected attributes | 23-06-2014 |
| 2 | .One type of model that you can create is a Decision Tree - train a Decision Tree using the complete dataset as the training data. Report the model obtained after training. | 30-06-2014 |
| 3 | Suppose you use your above model trained on the complete dataset, and classify credit good/bad for each of the examples in the dataset. What % of examples can you classify correctly ? | 07-07-2014 |
| 4 | Is testing on the training set as you did above a good idea ? Why orWhy not ? One approach for solving the problem encountered in the previous question is using cross-validation ? Describe what is cross-validation briefly. Train a Decistion Tree again using cross-validation and report your results. Does your accuracy increase/decrease ? Why ? | 14-07-2014 |
| 5 | Check to see if the data shows a bias against "foreign workers" (attribute 20),or "personal-status" (attribute 9). One way to do this (perhaps rather simple minded) is to remove these attributes from the dataset and see if the decision tree created in those cases is significantly different from the full dataset case which you have already done. To remove an attribute you can use the preprocess tab in Weka's GUI Explorer. Did removing these attributes have any significant effect? Discuss. | 21-07-2014 |
| 6 | Another question might be, do you really need to input so many attributes to get good results? Maybe only a few would do. For example, you could try just having attributes 2, 3, 5, 7, 10, 17 (and 21, the class attribute (naturally)). Try out some combinations. (You had removed two attributes in problem 7. Remember to reload the arff data file to get all the attributes initially before you start selecting the ones you want.) | 28-07-2014 |
| 7 | Sometimes, the cost of rejecting an applicant who actually has a good credit (case 1) might be higher than accepting an applicant who has bad credit (case 2). Instead of counting the misclassifcations equally in both cases, give a higher cost to the first case (say cost 5) and lower cost to the second case. You can do this by using a cost matrix in Weka. Train your Decision Tree again and report the Decision Tree and cross-validation results. Are they significantly different from results obtained in problem 6 | 04-08-2014 |

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| | (using equal cost)? | |
| 8 | Do you think it is a good idea to prefer simple decision trees instead of having long complex decision trees ? How does the complexity of a Decision Tree relate to the bias of the model ? | 11-08-2014 |
| 9 | <p>You can make your Decision Trees simpler by pruning the nodes. One approach is to use Reduced Error Pruning - Explain this idea briefly. Try reduced error pruning for training your Decision Trees using cross-validation (you can do this in Weka) and report the Decision Tree you obtain ? Also, report your accuracy using the pruned model. Does your accuracy increase ?</p> <p>(Extra Credit): How can you convert a Decision Trees into "if-then-else rules". Make up your own small Decision Tree consisting of 2-3 levels and convert it into a set of rules. There also exist different classifiers that output the model in the form of rules - one such classifier in Weka is rules.PART, train this model and report the set of rules obtained. Sometimes just one attribute can be good enough in making the decision, yes, just one ! Can you predict what attribute that might be in this dataset ? OneR classifier uses a single attribute to make decisions (it chooses the attribute based on minimum error). Report the rule obtained by training a one R classifier. Rank the performance of j48, PART and oneR</p> | 25-08-2014 |
| 10 | Hospital Management System | 01-09-2014 |

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| Monday | | Thursday | |
| Tuesday | | Friday | |
| Wednesday | | Saturday | |