MANONMANIAM SUNDARANAR UNIVERISTY,
TIRUNELVELI-12
SYLLABUS
PG - COURSES – AFFILIATED COLLEGES
Course Structure for MCA
(Choice Based Credit System)
(with effect from the academic year 2021-2022 onwards)

Semester-III				
Part	Subject Status	Subject Title	Subject Code	Credit
3	Core	DATA SCIENCE & ANALYTICS	ZCAM31	4
3	Core	ADVANCED DIGITAL IMAGE PROCESSING	ZCAM32	4
3	Core	PRINCIPLES OF COMPILER DESIGN	ZCAM33	4
3	Core	RESEARCH METHODOLOGY	ZCAM34	4
4	Elective - 2	MOBILE COMPUTING	ZCAE33	3
3	Practical	DATA SCIENCE & ANALYTICS USING R LAB	ZCAL31	2
3	Practical	MINI PROJECT	ZCAL32	6

Total Marks: 100   Internal Exam: 25 marks + External Exam: 75 marks

A. **Scheme for internal Assessment**:
   Maximum marks for written test: **15 marks**
    3 internal tests, each of **I hour** duration shall be conducted every semester.
   To the average of the **best two** written examinations must be added the marks scored
   in. The **assignment** for 5 marks and Seminar for 5 marks

   The break up for internal assessment shall be:
   Written test- 15 marks; Assignment -5 marks; Seminar-5 Marks Total - 25 marks

B. **Scheme of External Examination**
   3 hrs. examination at the end of the semester
   A – Part : 1 mark question two - from each unit
   B – Part : 5 marks question one - from each unit
   C – Part : 8 marks question one - from each unit

➢ **Conversion of Marks into Grade Points and Letter Grades**

S.No.	Percentage of Marks	Letter Grade	Grade Point	Performance
1	90 - 100	O+	10	Outstanding
2	80 - 89	O	9	Excellent
3	70 - 79	A+	8	Very Good
4	60 - 69	A	7	Good
5	55 - 59	B+	6	Above Average
6	50 - 54	B	5	Pass
7	0 - 49	RA	-	ReAppear
8	Absent	AA	-	Absent

➢ **Cumulative Grade Point Average (CGPA)**

$$CGPA = \frac{\Sigma (GP \times C)}{\Sigma C}$$

- **GP** = Grade point, **C** = Credit
- CGPA is calculated only for Part-III courses
- CGPA for a semester is awarded on cumulative basis

➢ **Classification**
   a) First Class with Distinction   : CGPA ≥ 7.5*
   b) First Class   : CGPA ≥ 6.0
   c) Second Class   : CGPA ≥ 5.0 and < 6.0
   d) Third Class   :   CGPA< 5.0

DATA SCIENCE & ANALYTICS

OBJECTIVES
- To enable the students to understand the techniques available in handling the voluminous data and to apply the concepts of data analytics to the challenges and issues available on hand.

OUTCOMES
- Understand the need for the big data analytics
- Appreciate the effectiveness of the techniques and algorithms that are available for handling big data
- Apply the data analytic techniques for their data analysis

UNIT – I INTRODUCTION TO DATA SCIENCE
Introduction: Introduction of Data Science-Getting started with R- Exploratory Data Analysis- Review of probability and probability distributions- Bayes Rule Supervised Learning- Regressionpolynomial regression- local regression- knearest neighbors

UNIT – II UNSUPERVISED LEARNING
Unsupervised Learning- Kernel density estimationk-means- Naive Bayes- Data and Data Scraping Classification-ranking- logistic regression. Ethics- time seriesadvanced regression- Decision trees- Best practicesfeature selection.

UNIT – III BIG DATA FROM DIFFERENT PERSPECTIVES
Big data from business Perspective: Introduction of big data-Characteristics of big data-Data in the warehouse and data in Hadoop- Importance of Big data- Big data Use cases: Patterns for Big data deployment. Big data from Technology Perspective: History of HadoopComponents of Hadoop-Application Development in Hadoop-Getting your data in Hadoop-other Hadoop Component.

UNIT – IV INFOSPHERE BIGINSIGHTS
Infosphere Big Insights: Analytics for Big data at rest-A Hadoop-Ready Enterprise-Quality file system-Compression –Administrative tooling-SecurityEnterprise Integration –Improved workload scheduling-Adaptive map reduce-Data discovery and visualization-Machine Analytics.

UNIT – V INFOSPHERE STREAMS
Infosphere Streams: Analytics for Big data in motionInfosphere Streams Basicsworking of Infosphere Streams-Stream processing language-Operators-Stream toolkits-Enterprise class

REFERENCES
1. Data Science and Big Data Analytics: Discovering, Analyzing, Visualizing and Presenting Data Hardcover , EMC Education Services, Wiley Publication, 2015
2. Big Data with Hadoop MapReduce: A Classroom Approach 1st Edition by Rathinaraja Jeyaraj , Ganeshkumar Pugalendhi ,Anand Paul, CRC Press

3. The Data Science Handbook Hardcover – Illustrated by Field Cady, 2017.

ADVANCED DIGITAL IMAGE PROCESSING

OBJECTIVES
- To provide complete knowledge on Digital Image Processing methods, such as image processing methods in Spatial domain and Frequency domain, Edge detection, Compression, Segmentation, and Morphological concepts, which enable the students to understand the concepts and implement them empirically.

OUTCOMES
- Review the fundamental concepts of a digital image processing system and Analyze images in the frequency domain using various transforms.
- Evaluate the techniques for image enhancement and image restoration. Categorize various compression techniques.
- Interpret Image compression standards, and Interpret image segmentation and representation techniques.

UNIT - I
Fundamentals - The MATLAB Desktop - Using Mat lab Editor /Debugger getting help-saving and Retrieving work session data - Digital Image Representation - Image I/O and Display – Classes and Image Types - M-Function Programming.

Intensity Transformation and Spatial Filtering: Background - Intensity transformation - Histogram Processing and function Plotting - Spatial filtering - Image processing toolbox standard spatial filters.

UNIT - II
The 2-D Discrete Fourier transform - Computing and Visualizing the 2-D DFT in MATLAB – Filtering in the Frequency domain - Obtaining frequency domain filters from spatial filters - High pass (sharpening) frequency domain filters.
Image Restoration and Reconstruction: A model of the image degradation / restoration process - Noise models - Restoration in the presence of Noise only – Periodic
Noise reduction using Frequency Domain Filtering – Modeling the Degradation Function - Direct Inverse Filtering - Wiener filtering.

UNIT - III
Colour image representation in MATLAB - converting to other color spaces - The basics of color image processing - Color transformation - Spatial Filtering of colour images. Working directly in a RGB vector space.
Wavelets: Background - The fast wavelet transform -Working with wavelet decomposition structures - The inverse wavelet transform- Wavelets in image processing.

UNIT - IV
Image Compression: Background - Coding Redundancy - Spatial Redundancy - Irrelevant information- JPEG Compression.
Morphological Image Processing: Preliminaries - Dialation and Erosion - Combining Dialation and erosion - Labelling connected components

UNIT - V
Image Segmentation: Point, line and edge detection - Line detection using the Hough transform – Thresholding – Region - Based segmentation using the Watershed transform.
Representation and Description: Background – Representation - Boundary Descriptors.

Reference Books:
1. Rafael C.Gonzalez, Richard E.Woods, Steven L.Eddins, "Digital Image Processing Using MATLAB", Third Edition, Tata Mc Graw Hill Private Limited, New Delhi, 2011.
2. Anil.K.Jain, "Fundamentals of Digital Image Processing", PHI Learning Pvt. Ltd., 2011.
3. S.Jayaraman, S.Essakirajan & T.Veerakumar, "Digital Image Processing"|, Second Edition, McGraw Hill, 2020.
4. Rafael C.Gonzalez, Richard E. Woods, "Digital Image Processing", Fourth Edition, Pearson Education, 2018.

PRINCIPLES OF COMPILER DESIGN

OBJECTIVES
- Discover principles, algorithms and techniques that can be used to construct various phases of compiler.
- Acquire knowledge about finite automata and regular expressions
- Learn context free grammars, compiler parsing techniques.
- Explore knowledge about Syntax Directed definitions and translation scheme

OUTCOMES
- Use the knowledge of patterns, tokens & regular expressions for solving a problem in the field of data mining.

UNIT I
Introduction to Compiler: Language Processors – The Structure of Compiler – The Science of Building a Compiler – Application of Compiler Technology - Programming Language Basics.
A Simple Syntax – Directed Translator: Syntax Definition – Syntax Directed Translation – Parsing – A Translator of Simple Expression – Lexical Analysis – Symbol Table – Intermediate Code Generation.

UNIT II
Lexical Analysis: The Role of the Lexical Analyzer – Input Buffering – Specification of Tokens– Recognition of Tokens – The Lexical – Analyzer Generator Lex – Finite Automata – From Regular Expression to Automata – Design of a Lexical-Analyzer Generator – Optimization of DFA – Based Pattern Matchers.

UNIT III
Syntax Analysis: Introduction – Context-Free Grammars – Writing a Grammar – Top-Down Parsing – Bottom-Up Parsing – Introduction to LR Parsing: Simple LR – More Powerful LR Parsers – Using Ambiguous Grammars – The Parser Generator Yacc.

UNIT IV
Syntax Directed Translation: Syntax-Directed Definitions – Evaluation Orders for SDD's – Applications of Syntax Directed Translation – Syntax Directed Translation Schemes
Intermediate-Code Generation: Variants of Syntax Trees – Three – Address Code – Types and Declarations – Translations of Expressions – Type Checking – Control Flow – Back patching – Switch Statements – Intermediate Code for Procedures.

UNIT V
Run-Time Environments: Storage Organization – Stack Allocation of Space – Access to Nonlocal Data on the Stack.
Code Generation: Issues in the Design of a Code Generator – The Target Language – Address in the Target Code – Basic Blocks and Flow Graph.

Reference Books:
1. Alfred V.Aho, Monica S. Lam, Ravi Sethi, Jeffrey D.Ullman, "Compilers – Principles, Techniques and Tools", Pearson Education Asia, Second Edition, 2014
2. Terence Halsey, Compiler Design Principles, Techniques and Tools, Larsen and Keller Education, 2018
3. Dick Grune, Kees van Reeuwijk, Henri E.Bal Ceriel J.H Jacobs, Koen Langendoen : Modern Compiler Design, Second Edition, Springer 2012.
4. Douglas Thain " Introduction to Compilers and Language Design" University of Notre Dame, 2019

RESEARCH METHODOLOGY

OBJECTIVES
- To understand the importance of Research Methodology
- To apply the statistical testing to prove the hypothesis
- To make use of computer aids to analyze the data, prepare reports and presentations Able to evaluate methodology of teaching

OUTCOMES
- Ability to apply different research approaches and methodologies
- Construct and document an appropriate research design
- Effectively apply the appropriate computer tools in each stage of research
- Ability to perform ICT based Teaching Methods

UNIT I
Introduction - Meaning of Research – Objectives of Research – Types of Research – Motivation of Research – Research approaches – Significance of Research – Research Methods versus Methodology – Research and Scientific method – Research process – Criteria of good Research – Problems encountered by Researchers in India.
Defining the Research Problem: What is a Research problem - Selecting the Problem – Technique involved Defining a problem.
Research Design: Meaning – Need for Research Design – Features of Good Design – Important concept relating to Research design – Different Research designs – Basic Principles of Experimental Designs

UNIT II
Sampling Design : Census and Sample Survey – Implications of a sample design – Steps in sample design - Criteria of selecting a sampling procedure – Characteristics of a good sample design – Different types of sample design – How to select a random sample – Random sample from an infinite Universe – Complex random sampling designs.
Measurements and Scaling techniques : Measurement in Research – Measurement scales – Sources of error in Measurement – Test and sound Measurements – Technique of developing measurement tools – Scaling, Meaning of scaling – Scale classification bases – Important scaling techniques – Scale Construction techniques.

UNIT III
Chi-Square Test for large samples – Definition of Chi-Square – Limitations of Chi-Square test - Chi-Square test as a test of goodness of fit and as a test of independence – Yate's correction and its applications.
Analysis of Variance (ANOVA): Concept – One way ANOVA – ANOVA in test in Latin Square Design

UNIT IV

Data Collection: Methods of Data Collection – Collection of Primary Data – Observation Method – Interview method – Collection of data through Questionnaires – Collection of data through Schedules – Some other methods of data collection – Collection of secondary data – Selection of appropriate method for data collection.

Interpretation and Report Writing: Meaning of interpretation – Why interpretation – Technique of interpretation – Precaution in Interpretation – Significance of Report Writing

UNIT – V

Introduction – Algorithmic Research Problems – Types of Solution Procedure/ Algorithm – Steps of Development of Algorithm – Steps of Algorithmic research – Design of Experiments and Comparison of Algorithms – Meta Heuristics for Combinational Problems. The Computer – Its role in Research – The Computer and Computer Technology – The Computer System – Important Characteristics - Computer Applications – Computer and Researchers.

Reference Books:

1. C.R.Kothari, "Research Methodology Methods and Techniques", Second edition, New Age International Publishers, 2020.
2. R.Panneerselvam, "Research Methodology", PHI, 2009.
3. S.C Gupta and V.K Kapoor, "Fundamentals of Mathematical statistics", Sulthan Chand & Sons, Delhi, 2020.
4. Deepak Chawla and Neena Sondhi," Research Methodology: Concepts and Cases",Vikas Publishing House, 2016.
5. David M.Levine, David F Stephen,e al., "Business Statistics", Pearson Publisher, 7th edition,2017.
6. Ranjit Kumar "Research Methodology: A Step-by-step Guide for Beginners", Sage Publications Ltd, 2019.

OPTIMIZATION TECHNIQUES

OBJECTIVES
- To understand the role and principles of optimization techniques in business world.
- To understand the process of problem statement formulation of the business scenario.
- To understand the implementation of various decision making techniques in the process of decision making.
- To gain the techniques and skills on how to use optimization techniques to support the decision making in business world.

OUTCOMES
- Apply problem solving techniques through OR approaches.
- Formulate the problem using linear programming technique.
- To analyze the optimal solution for the given problem by applying

Transportation problems.
- To analyze the strategies with different players through game theory approach.
- To analyze the sequence of jobs to be executed by machines for the given problem.

UNIT – I LINEAR PROGRAMMING PROBLEM (LPP)
Introduction, structure of linear programming model, advantages, general model of Linear programming problem(LPP), examples of LP formulation, graphical solutions of LP problem and Solution of LPP by simplex method.

UNIT – II LINEAR PROGRAMMING PROBLEM (LPP)
Artificial variables-two-phase method, Big M method. Duality in linear programming, formulation of dual linear programming and examples.(9L)

UNIT – III TRANSPORTATION AND ASSIGNMENT PROBLEMS
Mathematical model of transportation problem, methods of finding initial solution (Northwest corner rule, Least cost method, Vogel's approximation method), test for optimality in TP using MODI Method. Mathematical model of assignment problem, Hungarian method for solving assignment problem.

UNIT – IV THEORY OF GAMES
Introduction, two-person zero sum games, pure strategies (MinMax and MaxMin principles), mixed strategies. The rules of principles of dominance, algebraic method to solve games without saddle point, graphical methods to solve games.

UNIT – V NETWORK ANALYSIS
PERT and CPM, Network construction and determination of critical path, Calculation of ES, EF, LS, LF, TF, FF and IF, Crashing of a project, Scheduling of a project and resource levelling.

REFERENCES
1. Operations Theory and Applications, J.K. Sharma, 5th edition, MacMillan publisher India, 2016
2. Operations Research – An Introduction Taha H A- Pearson Edition ,7th edition,2017
3. An Introduction to optimization Techniques - Vikrant Sharma,Vinod Kumar Jain,Atul Kumar, Chapman and Hall/CRC, 2021.

MOBILE APPLICATION DEVELOPMENT

OBJECTIVES
- Android Application Development course is designed to quickly get you up to speed with writing apps for Android devices.
- The student will learn the basics of Android platform and get to understand the application lifecycle

OUTCOMES
- Develop effective user interfaces that leverage evolving mobile devices
- Develop applications using software development kits (SDKs), frameworks and toolkits.
- Implement suitable methods to integrate database and server-side technologies
- Design and develop open source software based mobile application to the given problem.
- Build and deploy competent mobile application to solve the societal/industrial problems

UNIT – I INTRODUCTION
Preliminary Considerations – Cost of Development – Importance of Mobile Strategies in the Business World – Effective use of Screen Real Estate – Understanding Mobile Applications: Understanding Mobile Applications Users – Understanding Mobile Information Design – Understanding Mobile Platforms – Using the Tools of Mobile Interface Design.

UNIT – II GETTING STARTED WITH ANDROID PROGRAMMING
What is Android – Obtaining the required tools– Anatomy of an Android Application – Components of Android Applications – Activities – Fragments – Utilizing the Action Bar.

UNIT – III ANDROID UI DESIGN AND LOCATION BASED SERVICES
Views and View Groups – Basic Views – Fragments – Displaying Maps – Getting Location Data – Publishing for Publishing – Deploying APK Files

UNIT – IV ANDROID MESSAGING AND NETWORKING
SMS Messaging – Sending Email – Networking – Downloading Binary Data, Text files – Accessing Web Services – Performing Asynchronous Call – Creating your own services – Communicating between a service and an activity – Binding activities to services

UNIT – V FEEDBACK AND OSCILLATOR CIRCUITS
iOS – Obtaining the tools and SDK – Components of XCODE – Architecture of iOS – Building Derby App in iOS – Other useful iOS things – Windows Phone: Getting the tools you need – Windows Phone 7 Project Building Derby App in Windows Phone 7 – Distribution – Other useful Windows Phone Thing

REFERENCES
1. Android Application Development All-in-One for Dummies, 3rd Edition, Barry Burd, John Paul Mueller , Wiley Publications ISBN: 978-1-119-66045-3 July 2020
2. McWherter and Scott Gowell, "Professional Mobile Application Development", 3rd Edition, ISBN: 978-1-118-20390-3, 2012
3. Beginning Android 4 Application Development, by Wei-Meng Lee; ISBN: 978-1-1181-9954-1, 2017

Elective 2: 3. MOBILE COMPUTING

OBJECTIVE:

- To impart knowledge to the students about the concepts of Mobile Technologies, Issues and Architecture provided by various Protocols.

OUTCOMES:

Student will be able to

- Understand concepts of Mobile Computing,
- Analyze various protocols used in mobile and wireless communication networks.
- Possess the basic skills in Developing Mobile Application

UNIT 1

Basics of Communication Technologies: Mobile Handsets, Cell Phone Systems, Components of Wieless Communication system, Architecture of Mobile Telecommunication system, Mobile Networking standards, WLANs, Bluetooth Technology

Introduction to Mobile Computing and Wireless Networking: Mobile Computing, Applications, Characteristics, Structure of Mobile Computing Application, Cellular Mobile Communication, GSM, GPRS, and UMTS.(9L)

UNIT 2

MAC Protocols: Properties, Issues in Wireless MAC Protocols, Fixed Assignment Schemes, Random Assignment Schemes, Reservation Based Schemes.

Support for mobility: 3 Wireless application protocol (version 1.x) – Architecture, Wireless datagram protocol, Wireless transport layer security, Wireless transaction protocol, Wireless session protocol , Wireless Application Environment, Wireless Markup Language, WMLScript, iMode, SyncML, WAP 2.0,(9L)

UNIT 3

Mobile Network Layer: Mobile IP, Entities and terminology, IP packet delivery, Agent discovery, Registration, Tunneling and encapsulation, Optimizations, Reverse tunneling, IPv6, Dynamic host configuration protocol, Mobile ad-hoc networks, Routing

Mobile Transport Layer: Traditional TCP- Congestion control, Slow start, Fast retransmit/fast recovery, Classical TCP improvements - Indirect TCP, Snooping TCP, Mobile TCP, Fast retransmit/fast recovery, Transmission/time-out freezing, Selective retransmission, Transaction-oriented TCPTCP over 2.5/3G wireless networks. (9L)

UNIT 4

Mobile Databases: Issues in Transaction Processing- Centralized, Client-Server, Distributed, and Mobile Environment, Data Dissemination, Transaction Processing in Mobile Environment – Atomicity, Consistency, Isolation and Durability Relaxation, Data

Replication, Mobile Transaction Models, Rollback Process, Two-Phase commit Protocol, Query Processing.

OS for Mobile Computing: Basic Concepts, Constraints and Requirements, Mobile Operating systems, Comparative study of Mobile OS.(9L)

UNIT 5

Mobile Application Development and Protocols: Mobile Devices as Web Clients, J2ME, Android Application Development – SDK, Features, Components, Stack Structure, Advantages of Android.

Mobile Commerce: Applications of M-Commerce – B2C, B2B, Structure of M-Commerce, Pros and Cons, Mobile Payment Schemes, Security Issues in M-Commerce.

REFERENCES:

1. Fundamentals of Mobile Computing, Second Edition, By PATTNAIK, PRASANT KUMAR, MALL, RAJIB · 2015 (chapter 1, 2, 3, 6, 9, 10 and 11)
2. Jochen H. Schiller, "Mobile Communcations", Second Edition, Pearson Education,2007 (Chapter 8 9, and 10)
3. Asoke K Talukder , Hasan Ahmed and Roopa R Yavagal, "Mobile Computing : Technology, Applications and Service Creation", Second Edition , TMH, 2010
4. Raj Kamal, "Mobile Computing", Second Edition,Oxford University Press,2012
5. Joseph Anderson, "Mobile Computing: Technology and Applications" Clanrye International publisher, 2020

PROFESSIONAL ETHICS

OBJECTIVES
- To understand the concepts of computer ethics in work environment.
- To understand the threats in computing environment
- To Understand the intricacies of accessibility issues
- To ensure safe exits when designing the software projects

OUTCOMES
- Learn the moral issues and problems in engineering; find the solution to those problems.
- Learn the need for professional ethics, codes of ethics and roles, concept of safety, risk assessment.
- Gain exposure to Environment Ethics & computer ethics; know their responsibilities and rights

UNIT I: COMPUTER ETHICS INTRODCUTION AND COMPUTER HACKING
A general Introduction – Computer ethics: an overview – Identifying an ethical issue – Ethics and law – Ethical theories - Professional Code of conduct – An ethical dilemma – A framework for ethical decision making - Computer hacking – Introduction – definition of hacking – Destructive programs – hacker ethics - Professional constraints – BCS code of conduct – To hack or not to hack? – Ethical positions on hacking.

UNIT II: ASPECTS OF COMPUTER CRIME AND INTELLECTUAL PROPERTY RIGHTS
Aspects of computer crime - Introduction - What is computer crime – computer security measures – Professional duties and obligations - Intellectual Property Rights – The nature of Intellectual property – Intellectual Property – Patents, Trademarks, Trade Secrets, Software Issues, Copyright - The extent and nature of software piracy – Ethical and professional issues – free software and open source code.

UNIT III: REGULATING INTERNET CONTENT, TECHNOLOGY AND SAFETY
Introduction – In defence of freedom expression – censorship – laws upholding free speech – Free speech and the Internet - Ethical and professional issues - Internet technologies and privacy – Safety and risk – assessment of safety and risk – risk benefit analysis – reducing risk.

UNIT IV: COMPUTER TECHNOLOGIES ACCESSIBILITY ISSUES
Introduction – Principle of equal access – Obstacles to access for individuals – professional responsibility - Empowering computers in the workplace – Introduction – computers and employment – computers and the quality of work – computerized monitoring in the work place – telecommuting – social, legal and professional issues - Use of Software, Computers and Internet-based Tools - Liability for Software errors –

Documentation Authentication and Control – Software engineering code of ethics and practices – IEEE-CS – ACM Joint task force.

UNIT V: SOFTWARE DEVELOPMENT AND SOCIAL NETWORKING
Software Development – strategies for engineering quality standards – Quality management standards – Social Networking – Company owned social network web site – the use of social networks in the hiring process – Social Networking ethical issues – Cyber bullying – cyber stalking – Online virtual world – Crime in virtual world - digital rights management - Online defamation – Piracy – Fraud.(9L)

REFERENCES
1. Caroline Whitback," Ethics in Engineering Practice and Research ", Cambridge University Press, 2011.
2. George Reynolds, "Ethics in Information Technology", Cengage Learning, 2018
3. Ethics in Computing Joseph Migga Kizza, Springer, Cham, 978-3-319-29106-2, 2019.
4. Ethics in engineering: Mike W.Martin Roland, McGraw Hill, 2017

DATA SCIENCE & ANALYTICS USING R LAB

1. R program to create a Sequence of numbers from 20 to 50 and find the Mean of numbers from 20 to 60 and Sum of numbers from 51 to 91.
2. R program to create a Vector which contains 10 random integer values between -50 and +50.
3. R program to get all Prime numbers up to a given number.
4. R program to read the .csv, .xls files and display the contents.
5. R program to use Built-in Mathematical Functions.
6. R program to get the Statistical Summary and Nature of the data of a given data frame.
7. Find the Data Distributions using Box and Scatter Plot using R.
8. Plot the Histogram, Bar Chart and Pie Chart on sample data using R.
9. Plot the Density and the Cumulative Probability Curve for a Normal Distribution with Mean= 2.5 and SD = 1.5 using R.
10. Build the Correlation Matrix using R.
11. Build a Decision Tree Classifier using R.
12. Build a Naïve Bayes Classifier using R.