CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – II Session - APR – MAY 2024, Month - JUN

Sem - CSE 4th (AI/DS)

Subject Name – R for Data Science **Subject- Code-B127475(022)**

Max Marks: 40 Min Marks:14 Time Allowed:2 hrs

Note: -Part A is compulsory, attempt any questions from B,C and D.

CO1: **Explain critical R programming concept.**
CO2: **Apply various concepts to write programs in R.**

Q.N.	Questions	Marks	Levels of Bloom's Taxonomy	COs
	Unit I			
Q1	Store the vector c(7,1,7,10,5,9,10,3,10,8) as foo. Identify the elements greater than 5 OR equal to 2.	[4]	Apply	CO1
Q2	Store the string "Two 6-packs for $12.99". Then do the following: i. Use a check for equality to confirm that the substring beginning with character 5 and ending with character 10 is "6-pack". ii. Make it a better deal by changing the price to $10.99.	[8]	Apply	CO1
Q3	The New Zealand government consists of the political parties National, Labour, Greens, and Maori, with several smaller parties labeled as Other. Suppose you asked 20 New Zealanders which of these they identified most with and obtained the following data 1. There were 12 males and 8 females; the individuals numbered 1, 5–7, 12, and 14–16 were females. 2. The individuals numbered 1, 4, 12, 15, 16, and 19 identified with Labour; no one identified with Maori, the individuals numbered 6, 9, and 11 identified with Greens; 10 and 20 identified with Other; and the rest identified with National. a. Use your knowledge of vectors (for example, subsetting and overwriting) to create two character vectors: sex with entries "M" (male) and "F" (female) and party with entries "National", "Labour", "Greens", "Maori", and "Other". Make sure the entries are placed in the correct positions as outlined earlier. b. Another six people joined the survey, with the results c("National", "Maori", "Maori", "Labour", "Greens", "Labour") for the preferred party and c("M", "M", "F", "F", "F", "M") as their gender. Combine these results with the original factors from (a).	[8]	Apply	CO1
Q4	Create a list that contains, in this order, a sequence of 20 evenly spaced numbers between −4 and 4, a 3 × 3 matrix of the logical vector c(F,T,T,T,F,T,T,F,F) filled column-wise; a character vector with the two strings "don" and "quixote", and a factor vector containing the observations c("LOW", "MED", "LOW", "MED", "MED", "HIGH"). Then, do the following i. Extract row elements 2 and 1 of columns 2 and 3, in that order, of the logical matrix. ii. Use sub to overwrite "quixote" with "Quixote" and "don" with "Don" inside the list. Then, using the newly overwritten list member, concatenate to the console screen the following	[8]	Apply	CO1

statement exactly:
"Windmills! ATTACK!"
-\Don Quixote/-
iii. Obtain all values from the sequence between −4 and 4 that are greater than 1.
iv. Using which, determine which indexes in the factor vector are assigned the "MED" level.

Unit II

Q1	Explain with example two methods to add new column to data frames.	[4]	Understand	CO2
Q2	Create and store this data frame as dframe in your R workspace: 	Person	Sex	Funny
---	---	---
Stan	M	High
Francine	F	Med
Steve	M	Low
Roger	M	High
Hayley	F	Med
Klaus	M	Med	 The variables person, sex, and funny should be identical in nature to the variables in the mydata object studied throughout Section 5.2. That is, person should be a character vector, sex should be a factor with levels F and M, and funny should be a factor with levels Low, Med, and High	[8]	Apply	CO2
Q3	With the following data, create a plot of weight on the x-axis and height on the y-axis. Use different point characters or colors to distinguish between males and females and provide a matching legend. Label the axes and give the plot a title. 	Weight (Kg)	Height (cm)	Sex
---	---	---
55	161	Female
85	185	Male
75	174	Male
42	154	Female
93	188	Male
63	178	Male
58	170	Female
75	167	Male
89	181	Male
67	178	Female		[8]	Apply	CO2
Q4	You have a CSV file named data.csv with the following content: Name,Age Alice,30 Bob,25 Charlie,35 Write an R script to perform the following tasks: 1. Read the data from data.csv into a data frame. 2. Add a new column named Gender to the data frame with the values "Female", "Male", and "Male" for Alice, Bob, and Charlie respectively. 3. Write the updated data frame to a new CSV file named updated_data.csv, ensuring that row names are not included in the output file.	[8]	Apply	CO2

Chhattisgarh Swami Vivekanand Technical University Bhilai
University Teaching Department

Class Test II

Branch : CSE-AI/DS | **Semester** : 4th

Subject : Data Visualization | **Subject Code** : B127476(022)

Max Mark : 40 | **Min Pass Marks** : 14

Note : Attempt any two question on Q2,Q3&Q4

PART -1

Question 1. What do you mean by Dimension Reduction. ..... (4 Marks)

Question 2. Explain Scatter plot with suitable example. ..... (8 Marks)

Question 3. Write short notes on:

(a) Mosaic plot (b) Nested Pies ..... (8 Marks)

Question 4. Explain Visualization along Linear Axes with suitable example ... (8 Marks)

PART - 2

Question 1. Define Cartogram with suitable Example..... (4 Marks)

Question 2. Explain various Visualizing Uncertainty ..... (8 Marks)

Question 3. Explain Various Visualizing Geospatial data. ..... (8 Marks)

Question 4. Explain Common pitfalls of color use. .....(8 Marks)

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Department of Computer Science & Engineering

Class Test – II Session- Jan – June, 2024 Month-June

Sem- BTech(II) 4th(AI / DS) Subject- CN Code- B127471(022)

Time Allowed 2 hrs Max Marks: 40 Min Marks: 14

Note: - Q1 is compulsory, attempt any two questions from Q2, Q3, and Q4.

CO3: The learner understands the algorithms and protocols of Network layer.
CO4: The learner understands the elements and protocols of Transport layer.
CO5: The learner understands the protocols of Application layer.

Q.N.	Questions	Marks	Levels of Bloom's Taxonomy	COs
	Unit III			
Q1	What is *Choke Packets*?	[4]	L1	CO3
Q2	Explain four Routing algorithms. Routing Table given below: - Destination | Subnet mask | Interface 128.75.43.0 | 255.255.255.0 | Eth0 128.75.43.0 | 255.255.255.128 | Eth1 192.12.17.5 | 255.255.255.255 | Eth3 default | 0.0.0.0 | Eth2 On which interfaces will the router forward packets addressed to destinations 128.75.43.16 and 192.12.17.10 respectively?	[8]	L3	CO3
Q3	What is Internetworking? Explain the format of the IPv4 datagram.	[8]	L2	CO3
Q4	What are the techniques for achieving good Quality of Service?	[8]	L2	CO3
	PUnit IV&V			
Q1	What are the primitives for a simple transport service?	[4]	L1	CO4
Q2	Discuss the elements of Transport protocols.	[8]	L2	CO4
Q3	What-is TCP? Draw and explain TCP segment header.	[8]	L2	CO4
Q4	What is Simple Network Management Protocol (SNMP)? Explain components and messages of SNMP.	[8]	L2	CO5

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY

Department of Computer Science & Engineering

Class Test – II Session- JAN – JUN, Month-April

Sem- CSE 4th(AI)

Subject Name – Artificial Intelligence: Principles and Applications

Subject-Code- B127472(022)

Max Marks: 40 Min Marks 14 Time Allowed 2 hrs

Note: -Attempt any two questions from Part A carrying 4 Marks each and any four questions from Part B carrying 8 marks each.

CO1: Students will demonstrate a comprehensive understanding of foundational concepts in artificial intelligence (AI) and its significance in modern computing.

CO2: Students will analyze and evaluate key concepts and methodologies in AI, including the Turing test, the Chinese Room Thought Experiment, and the distinctions between optimum reasoning/behavior and human-like behavior/reasoning.

CO3: Students will develop proficiency in search algorithms and optimization techniques used in AI.

	Questions	Marks	Levels of Bloom's Taxonomy	COs
	Part A			
Q1	Convert the following English sentences in the First Order Predicate Calculus i. All humans are mortal. ii. If it is raining, then the ground is wet. iii. Every student in the class passed the exam. iv. There exists a number that is greater than 5.	[4]	Understand	CO1
Q2	Explain the purpose of a box-plot in data visualization with an example.	[4]	Understand	CO2
Q3	What are the main differences between supervised, unsupervised, and reinforcement learning?	[4]	Understand	CO2
	Part B			
Q1	Explain the inference rules for FOPC, focusing on resolution, resolution-refutation, and answer-extraction. Provide examples for each to illustrate how they work.	[8]	Understand	CO3
Q2	Explain Bayes' Theorem with an example	[8]	Analyzing	CO3
Q3	Describe the concept of Hidden Markov Models (HMMs). How are they used in temporal probability modeling?	[8]	Analyzing	CO4
Q4	Discuss components involved in the Fuzzy reasoning/ Fuzzy Inference System, including fuzzification, rule base, inference engine, and defuzzification.	[8]	Understand	CO2
Q5	Explain the process steps with an example of a classification task in supervised learning.	[8]	Analyzing	CO4
Q6	Discuss the methods and techniques used for the visual exploration and analysis of spatial, temporal, and multidimensional relational data.	[8]	Understand	CO5

CHHATTISGARH SWAMI VIVEKANAND TECHNICAL UNIVERSITY, BHILAI

Department of Computer Science & Engineering

Class Test – II Session- April-May , 2024 Month- June

Sem CSE 4th (AI) Subject - Operating System Code- B127473(022)

Time Allowed 2 hrs Max Marks: 40

Note: - Question No. 1 is compulsory, attempt any two questions from: Question No. 2, 3 and 4.

CO1: Understand basics, services of Operating System and concept of deadlock in Operating System.
CO2: Understand the basics of memory patitioning, paging and segmentation .

Q.N.	Questions	Marks	Levels of Bloom's Taxonomy	COs
	Unit-III			
Q1	Explain necessary conditions of Deadlock.	[4]	Understand	CO1
Q2	Explain Banker's Algorithm with example.	[8]	Analyze	CO1
Q3	Explain deadlock avoidance and resource allocation graph.	[8]	Understand	CO1
Q4	Consider the following snapshot of a system: Allocation Max Available A B C D A B C D A B C D P_0 0 0 1 2 0 0 1 2 1 5 2 0 P_1 1 0 0 0 1 7 5 0 P_2 1 3 5 4 2 3 5 6 P_3 0 6 3 2 0 6 5 2 P_4 0 0 1 4 0 6 5 6 Answer the following question using the banker's algorithm: a) Calculate Need matrix. b) Is the system in safe state if yes then provide safe sequence. c) If a request from process P_1 arrives for (0,4,2,0) can the request be granted immediately.	[8]	Apply	CO1
	Unit -IV			
Q1	What is fragmentation explain.	[4]	Understand	CO1, CO2
Q2	Explain paging and segmentation with suitable figures.	[8]	understand	CO2
Q3	Explain variable and fixed partitioning.	[8]	Analyze	CO2
Q4	Using FIFO and LRU algorithm for the following refrence string with four page frames. calculate page faults. 1,2,3,4,5,3,4,1,6,7,8,7,8,9,7,8,9,5,4,5,4,2	[8]	Apply	CO2

Department of Computer Science & Engineering

Class Test – II Session- Feb – June, 2024 Month- April

Sem- CSE 5th(AI)

Subject- Theory of Computation **Code- B127474(0**

Time Allowed:2 hrs Max Marks: 40

Note: - Note: All questions are compulsory, attempt all questions from part A and B.

Q.N.	Questions	Marks	Bloom's Level
	Part A		
Q1 (a)	The following problems are undecidable a) Whether a given CFL is regular b) Membership problem in CFL c) Whether a finite state machine halts on all input d) An arbitrary Turing machine halts within 10 steps	[2]	Understand
Q1 (b)	Fortran is a a) Regular language b) Context free language c) Context sensitive language d) None of above	[2]	Understand
Q2	Construct a Push down automata (PDA) for following languages a) $L = \{a^i b^n c^n \mid n>=0\}$ b) A PDA which accepts set of balanced parentheses.	[2x4]	Apply
Q3	What is the use of GNF and CNF? Consider following grammar and convert to GNF: $\{S \rightarrow ABA \quad A \rightarrow aA/\in \quad B \rightarrow bB/\in\}$	[4]	Apply
Q4	Explain closure property of DCFL and NCFL in brief?	[4]	Apply
	Part B		
Q1(a)	If set A is set of recursive language and B is set of recursive enumerable language then which of the following is necessarily true- a) A is subset of B b) B is subset of A c) A and B are same set d) A and B are disjoint set	[2]	Apply
(b)	Which of the following language over {a, b, c} is accepted by a deterministic push down automata a) $\{wcw^R \mid w \in (a, b)^*\}$ b) $\{ww^R \mid w \in (a, b)^*\}$ c) $\{a^n b^n c^n \mid n>=0\}$ d) {w | w is a palindrome number over {a, b, c}}	[2]	Apply

Q2	Design a Turing machine (TM) to accepts strings over the input alphabet {0, 1} where the strings a) L = {{$a^n b^n$ | n>=0} b) Strings ends with 000	[2x4]	Apply	CO5
Q3	What are the different types of Turing Machine. Explain with suitable diagram?	[4]	Apply	CO5
Q4	Explain different decision property of Turing machine in brief?	[4]	Apply	CO5