

Data Warehousing and Mining 29/11/17

Time: 03 Hours

Marks: 80

- Note: 1. Question 1 is compulsory
2. Answer any three out of remaining questions.

Q1 A) A manufacturing company has a huge sales network. To control the sales, it is [10]
divided into regions. Each region has multiple zones. Each zone has different cities.
Each sales person is allocated different cities. The objective is to track sales figure
at different granularity levels of region and to count no. of products sold. Design a
star schema by considering granularity levels for region, sales person and time.
Convert the star schema to snowflake schema.

B) Discuss:

- i) Architecture of a typical data mining system.
ii) Application and major issues in Data Mining

[10]

Q2 A) Consider a data warehouse for a hospital where there are three dimension [10]
a) Doctor b) Patient c) Time

Consider two measures i) Count ii) Charge where charge is the fee that the doctor
charges a patient for a visit. For the above example create a cube and illustrate the
following OLAP operations.

- 1) Rollup 2) Drill down 3) Slice 4) Dice 5) Pivot.

B) Consider the data given below. Create adjacency matrix. Apply single link [10]
algorithm to cluster the given data set and draw the dendrogram

Object	Attribute 1 (X):	Attribute 2 (Y):
A	2	2
B	3	2
C	1	1
D	3	1
E	1.5	0.5

Q3 A) Define Metadata. Discuss the types of Metadata stored in a data warehouse. [10]
Illustrate with an example.

B) Discuss different steps involved in Data Pre-processing

[10]

Q4 A) Discuss various OLAP Models and their architecture

[10]

B) Define Classification. Discuss the issues in Classification. A simple example from [10]
the stock market involving only discrete ranges has profit as categorical attribute,
with values { Up, Down } and the training data is:

29/11/17

Age	Competition	Type	Profit
Old	Yes	Software	Down
Old	No	Software	Down
Old	No	Hardware	Down
Mid	Yes	Software	Down
Mid	Yes	Hardware	Down
Mid	No	Hardware	Up
Mid	No	Software	Up
New	Yes	Software	Up
New	No	Hardware	Up
New	No	Software	Up

Apply decision tree algorithm and show the generated rules.

Q5 A) Differentiate top-down and bottom-up approaches for building data warehouse. [10]
Discuss the merits and limitations of each approach.

B) i) Discuss Association Rule Mining and Apriori Algorithm. [10]

ii) A database has four transactions. Let minimum support = 50% and minimum confidence = 50%

TID	Items-bought
T100	A,B,C
T200	A,C
T300	A,D
T400	B,E,F

Find all frequent item sets using apriori algorithm. List strong association rules.

Q6 Write short note on the following (Answer any **FOUR**)

[20]

- Fact Constellation
- Data visualization
- FP Tree
- DBSCAN
- ETL Process

2/2

GE sem. VIII Computer (CBSSGS)
Time: 3 Hours Sub - HMI

Q.P. Code: 27188

Date - 07/12/17
(Total Marks 80)



Question no 1 is compulsory

solve any 3 from Q2 to Q6

Indicate your answers with neat sketch wherever necessary

Q1 . ATTEMPT ANY FOUR

20

- a) Explain The term "Poor Design Affects Reading"
- b) Explain the steps to design Persona.
- c) What do you mean by Direct Manipulation and Indirect Manipulation?
- d) Explain Goal Directed Design in Detail.
- e) What are various advantages of Digital and Graphics Systems?

Q2a) Provide various factors of Interface Design, justify your answer with proper example. 10

b) Differentiate between Qualitative and Quantitative Research 10

Q3 a) What do you mean by response time? Explain salient features that are adopted with respect to response time. 10

b) Explain in detail about Gestalt's Principles. 10

Q4 a) Explain Various Menus in HMI. 10

b) Explain what do you mean by Keyboard Accelerators? 10

Q5 a) Explain How Colours Play Major Role in Human Interface Design? 10

b) Differentiate between Web Page Navigation and Printed Page Navigation. 10

Q6 Write Short Note on following 20

- a) Windows
- b) Interview Techniques
- c) Mental Model
- d) Statistical Graphics.

BE Sem VIII (computer) (CBSS) Q.P. Code: 25653

Duration: 3 Hours

Sub - parallel and

13/12/17
[Total Marks -80]

Distributed systems.



N.B. (i) Q. No. 1 is compulsory

(ii) Attempt any **three** questions out of the remaining **five** questions

- | | | |
|-------|---|----|
| 1 (a) | How Pipeline Architecture is different from Array Processor architecture | 05 |
| (b) | Explain the various types of Parallel Programming Models? | 05 |
| (c) | Explain a method of Dynamic Instruction scheduling for minimizing hazards. | 05 |
| (d) | Explain Dataflow Computer with examples. | 05 |
| 2 (a) | Explain different types of pipeline Hazards and the techniques used to eliminate those hazards. | 10 |
| (b) | Describe Architectural Model of Distributed System with neat diagram. | 10 |
| 3 (a) | Discuss in detail the various performance metrics in parallel computing. | 10 |
| (b) | Explain Lamport's Distributed Mutual Algorithm. | 10 |
| 4 (a) | Explain Matrix Multiplication on SIMD. | 10 |
| (b) | Discuss File caching for Distributed Algorithm. | 10 |
| 5 (a) | Compare and contrast Task Assignment, Load Balancing and Load Sharing approaches | 10 |
| (b) | Explain call Semantics of RPC. | 10 |
| 6 (a) | Describe any one Election algorithm in detail with an example. | 10 |
| (b) | Explain File Accessing Models. | 10 |

----- x -----

Time: 3 Hours

Marks: 80

N.B.:

1. Question No.1 is **compulsory**.
2. Attempt any **Three** questions out of remaining **Five** questions.
3. Figures to the right indicate full marks.
4. Assume any suitable data wherever required but justify the same.

- Q.1**
- a) Explain the key terminologies of Support Vector Machine. 5
 - b) What are the key tasks of Machine Learning? 5
 - c) Explain the concepts behind Linear Regression. 5
 - d) Explain in brief elements of Reinforcement Learning. 5
- Q.2**
- a) Explain the steps required for selecting the right machine learning algorithm. 8
 - b) For the given data determine the entropy after classification using each attribute for classification separately and find which attribute is best as decision attribute for the root by finding information gain with respect to entropy of Temperature as reference attribute. 12

Sr. No.	Temperature	Wind	Humidity
1	Hot	Weak	Normal
2	Hot	strong	High
3	Mild	Weak	Normal
4	Mild	Strong	High
5	Cool	Weak	Normal
6	Mild	Strong	Normal
7	Mild	Weak	High
8	Hot	Strong	Normal
9	Mild	Strong	Normal
10	Cool	Strong	Normal

- Q.3**
- a) Apply k-means algorithm on given data for $k=2$. Use $C_1(2, 4)$ & $C_2(6, 3)$ as initial cluster centres. 10
Data: $a(2, 4)$, $b(3, 3)$, $c(5, 5)$, $d(6, 3)$, $e(4, 3)$, $f(6, 6)$
 - b) Explain classification using Bayesian Belief Network with an example. 10
- Q.4**
- a) Define Support vector machine (SVM) and further explain the maximum margin linear separators concept. 10
 - b) Explain in detail Principal Component Analysis for Dimension Reduction. 10
- Q.5**
- a) Explain reinforcement learning in detail along with the various elements involved in forming the concept. Also define what is meant by partially observable state. 10

- b) Apply Agglomerative clustering algorithm on given data and draw dendrogram. Show three clusters with its allocated points. Use single link method.

10

Adjacency Matrix:

	a	b	c	d	e	f
a	0	$\sqrt{2}$	$\sqrt{10}$	$\sqrt{17}$	$\sqrt{5}$	$\sqrt{20}$
b	$\sqrt{2}$	0	$\sqrt{8}$	3	1	$\sqrt{18}$
c	$\sqrt{10}$	$\sqrt{8}$	0	$\sqrt{5}$	1	1
d	$\sqrt{17}$	3	$\sqrt{5}$	0	2	3
e	$\sqrt{5}$	1	1	2	0	$\sqrt{13}$
f	$\sqrt{20}$	$\sqrt{18}$	1	3	$\sqrt{13}$	0

Q.6

Write detail notes on (any two)

20

- Hierarchical Clustering algorithms.
- Hidden Markov model.
- Model Based Learning

12 Sem VIII Comp Engg. (CBGS)
Ad hoc Wireless Networks

Q. P. Code: 16297

Marks: 80

Time: 3 Hours

N.B.:1) Q.1 is compulsory

2) Attempt any **three** from remaining **five** questions

3) All questions carry equal marks

Q.1 a). What are the main issues that need to be addressed while designing a MAC protocol for Ad-hoc network? [10]

b). What are the design goals of a Transport Layer Protocol for Ad-hoc wireless networks? [10]

Q.2 a). Describe the working mechanism of MAC protocol using directional antenna. Explain one protocol in this category. [10]

b) Classify the network security attack and explain active attacks of any one layer. [10]

Q.3 a) Explain route establishment in DSDV with example. [10]

b) Explain issues and challenges in providing QoS in Ad-hoc wireless networks. [10]

Q. 4 a) Why does TCP not perform well in Ad-hoc wireless networks? Explain. [10]

b). Explain in details Ticket-based QoS routing protocol. [10]

Q.5 a) Explain the classification of routing protocols in Adhoc Networks and state the difference between proactive and reactive routing. [10]

b) Describe the issues and challenges faced in designing a security protocol for Ad-hoc Wireless Network. [10]

Q. 6. a) Define soft reservation. Explain soft reservation Multiple Access with Priority Assignment using frame structure [10]

b). Give brief explanations of power aware routing metrics of Ad-hoc wireless networks. [10]