Max. Marks:100

Second Semester M.Tech. Degree Examination, June/July 2015 Managing Big Data

Time: 3 hrs.	managing big bata
	Note: Answer any FIVE full questions.

What are the three types of big data that are a big deal for market? Discuss briefly each of 1 (10 Marks)

Analyse the operation of Distributed file system and RDBMS.

(10 Marks)

What is credit analytics? How does it help in the real world?

(08 Marks)

- b. How is it possible to detect brand with Big Data in social network analysis?
- (06 Marks)
- c. Consider a computer system which has four I/O channels and each channel can record data at 16MB/Sec. What is the time taken to read 2TB of data? What is the number of system required to read all the data if the time given is 5Sec. (06 Marks)
- a. How is NOSQL polyglot persistent?

(03 Marks)

- How is crowd sourcing a great way to capitalize on the resources that can build algorithms and predictive models?
- What is data aggregation? What are different data models used in NOSQL? Give example and explain.
- What is the main process of operation is master slave replication? What are the pros and cons of maser slave replication. (10 Marks)
 - What does CAP theory convey? Give an example to support CAP theorem.

(10 Marks)

- With a diagram explain the sequence of events that takes place when reading a file between the client and HDFS.
 - Write two racks with a at least 5 nodes in each rack. Show two data counter and process of pipeline replication placement when replication factor is 3. Show this distance for
 - i) Distance $(d^{1}/r^{1}/n^{1}, d^{1}/r^{1}/n^{1})$ ii) Distance $(d^{1}/r^{1}/n^{1}, d^{1}/r^{1}/n^{2})$
 - iii) Distance $(d^1/r^1/n^1, d^1/r^2/n^3)$ iv) Distance $(d^1/r^1/n^1, d^2/r^3/n^4)$

When n^1 , n^2 , n^3 , n^4 nodes r^1 , r^2 , and r^3 are racks and d^1 , d^2 are data centre. (10 Marks)

- What is the function of a combiner in Map reduce? How does it differ from Reduce function?
 - What is the procedure to recover from a failed name node?

(05 Marks)

- c. What is HDFS Federation? Explain with a diagram how Namenode, Namespace, Block pools and common storage configuration system work.
- List the different failures that need to be considered for MapReduce programs running on YARN. What is the effect of each failure.
 - What are different job schedulers available in later version of Hadoop? Explain the merit and demerit of each. (10 Marks)
- What is the difference between HBASE and HDFS in Hadoop?

(05 Marks)

- How is Cassandra considered as distributed decentralized, elastic, fault tolerant and columnoriented? (10 Marks)
- What are the main features of Big Latin script.

(05 Marks)

Important Note: 1. On completing your answers, compulsorily draw diagonal cross lines on the remaining blank pages.

2. Any revealing of identification, appeal to evaluator and /or equations written eg, 42+8 = 50, will be treated as malpractice.

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Second Semester M.Tech. Degree Examination, June/July 2015 Advances in Computer Networks

Time: 3 hrs.

Max. Marks:100

Note: Answer any FIVE full questions.

1 a. Describe the different cost effective resource sharing.

(08 Marks)

- b. Define the following: i) latency
 - iii) transmit time iv) o
- ii) propagation time iv) delay X bandwidth.

(04 Marks)

- c. Calculate the total time required to transfer a 1000 KB file in the following cases, assuming an RTT of 50 ms, a packet size of 1 KB data, and an intial $2 \times \text{RTT}$ of "hand shaking" before data is sent:
 - i) the band width is 1.5 Mbps, and data packets can be sent continuously
 - ii) the band width is 1.5 Mbps, but after we finish sending such data packet we must wait one RTT before sending the next. (08 Marks)
- 2 a. What is layering principle? Explain the layering principles in TCP/IP internet environment.
 - b. How "wide" is a bit on a 10 Gbps link? How long is a bit in copper wire, where the speed of propagation is 2.3×10^8 m/s. (04 Marks)
 - c. Explain the sliding window algorithm with time line, sender and receiver window.

(08 Marks)

3 a. What is a bridge? What are its limitations? Illustrate the working of a learning bridge.

(10 Marks)

- b. Explain the header field used in IP fragmentation. Suppose a TCP message that contains 1024 bytes of data and 20 bytes of TCP header is passed to IP for delivery across two networks interconnected by a router. The first network has a MTU of 1024 bytes; the second has an MTU of 576 bytes. Give the sizes and offset of the sequence of fragments delivered to destination host. Assume all IP header are 20 bytes. (10 Marks)
- 4 a. Explain the distance vector routing algorithm used for the network shown in Fig .Q4(a), give global distance vector table. Assume cost of each link is set to 1 when:
 - i) Initial distance stored at each node
 - ii) Initial routing table at node A
 - iii) Final routing table at node A
 - iv) Final distance stored at each node.

(10 Marks)

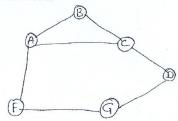


Fig. Q4(a)

b. Describe the format of a IPv4 mobility agent.

(10 Marks)

- 5 a. What ARP? Why is it needed? Explain the format of ARP packet and describe how ARP function on the internet.

 (10 Marks)
 - b. Explain the following:
 - i) BGP open message
 - ii) BGP update message.

(10 Marks)

- a. Define spooling? With neat diagram, explain the conceptual components of an electronic mail. (10 Marks)
 - b. What is URL? Give example of URL. Explain the GET request command with example.
 (10 Marks)
- 7 a. Explain the principle of bit by bit algorithm under round robin scheme, in Fair queuing for congestion control. (10 Marks)
 - b. Explain RED (random early detection) congestion avoidance mechanism.

(10 Marks)

8 a. Explain the network management architectural model.

(10 Marks)

- b. Write notes on following:
 - i) Domain hierarchy
 - ii) HTTP.

(10 Marks)

Second Semester M.Tech. Degree Examination, June/July 2015 Advanced Algorithms

Time: 3 hrs.

Max. Marks:100

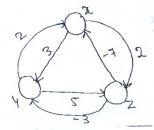
Note: Answer any FIVE full questions.

1 a. Use a recursion tree to determine a asymptotic upper bound on recurrence T(n) = 4T(n/2) + cn. Use the substitution method to verify your answer.

(10 Marks)

b. Write Johnsons algorithm for sparse graphs. Use same to find shortest paths between all pairs of vertices in the graph of Fig. Q1(b) (10 Marks)

Fig. Q1 (b)



 Define master method. Use master method to give tight asymptotic bounds for the following recurrences.

i) $T(n) = 4T(n/2) + n^2$

ii) $T(n) = 4T(n/2) + n^3$

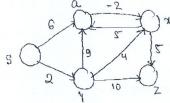
(07 Marks)

b. Define O, θ , Ω notations.

(03 Marks)

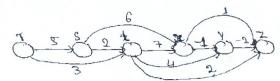
c. Write Bellman-Ford algorithm. Apply same to Fig. Q2(c) to find shortest path from source S to remaining vertices. (10 Marks)

Fig. Q2 (c)

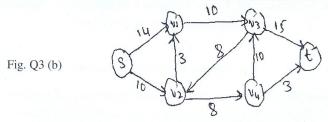


3 a. Write DAG-SHORTEST-PATHS algorithm Run the same the directed graph of Fig Q.3 (a) Using vertex r as the source. (10 Marks)

Fig. Q3 (a)



b. Write Ford-Fulkerson method. Run the same to find maximum flow in graph of Fig Q3 (b)



(10 Marks)

- 4 a. Write EXTENDED-EUCLID algorithm and compute the values (d, x, y) that the call EXTENDED-EUCLID (99, 78). (10 Marks)
 - b. Define group. Draw the group operation tables for the groups (Z_4, t_4) and $(Z_5^*, \dot{x}5)$ (08 Marks)

Write modular linear equation survey (a, b, n).

(02 Marks)

- 5 a. Write Chinese remainder theorem. (08 Marks)
 - b. Find all Solutions to the equation $x \equiv 2 \pmod{5}$ and $x \equiv 3 \pmod{13}$. (10 Marks)
 - c. Write modular exponentiation (a, b, n) algorithm. (02 Marks)
- 6 a. Construct the string matching automation for the pattern P = aabab and illustrate its operation on the text string T = aaababaabaabaabaabaab. (08 Marks)
 - b. Write naive string matching algorithm. (02 Marks)
 - c. Compute the prefix function π for the pattern babaca and illustrate its operation on the text string.

T = aababaababababacaa (10 Marks)

 Write Boyer-More string algorithm Apply Boyer-More algorithm to search for the pattern BARBER in the text.

JIM-SAW-ME-IN-A-BARBERSHOP (10 Marks)

- b. Explain Aggregate and Accounting methods with example. (10 Marks)
- 8 a. Explain Monte Carlo and Las Vegas algorithms with appropriate examples. (10 Marks)
 - b. Explain randomizing deterministic algorithms taking linear search algorithm as an example.

(10 Marks)

USN		14SCS2
		Second Semester M. Tech Degree Examination, June/July 2015
		Artificial Intelligence and Agent Technology
Tin	ne:	3 hrs. Max. Marks:100
		Note: Answer any FIVE full questions.
1	a. b	Define AI and discuss any two applications of AI. You are given two water jugs, a 6 – gallon one and 8 – gallon one. Neither of the jugs ha measuring marks on them. There is a pump that can be used to fill the jugs with water. How can you get exactly 4 – gallons of water into 8 – gallons jug? Define the problem as a statement of the problem.
	c.	space and solve the problem using state space approach. Discuss any two characteristics of AI problems in detail with examples. (09 Marks) (06 Marks)
2	a. b.	With examples, describe any three properties of task environments. (06 Marks Given the following initial and goal configuration of 8 – puzzle problem, use the Best First search method to obtain solution path from initial to goal configuration. Specify the heuristic function used. (06 Marks
		2 8 3 1 2 3 8 4 4 7 5 Initial State Goal State
	c.	
3	a. b.	Consider the following set of sentences. Represent them in predicate logic, convert them to clause form and prove the statement hate (marcus, Caesar) using resolution. i) Marcus was a man ii) Marcus was a Pompeian iii) All Pompeian's were Romans. iv) Caesar was a ruler v) All Romans were either loyal to Caesar or hated him vi) Everyone is loyal to someone vii) People only try to assassinate ruler's they are not loyal to viii) Marcus tried to assassinate Caesar. (12 Marks) Explain in detail construction of circuit based agents that operate using propositional logic. (08 Marks)
4	b.	With a diagram, describe non – monotonic reasoning. (04 Marks) Describe the following types of non – monotonic reasoning, with an example for each: i) Abduction ii) Inheritance. (06 Marks) State Baye's theorem and describe with an example how to perform reasoning using Baye's
<i>E</i>		network mechanism. (10 Marks)

a. Explain probabilistic inference using full joint distribution with an example. Also write algorithm for the same. (10 Marks) b. Describe in detail representation of knowledge as a Frame, considering an example.

(06 Marks) c. Write algorithm for property inheritance used in weak slot - & - filler structures. (04 Marks)

a. Write a script for going to a restaurant. (10 Marks) b. With an example show that Alpha – Beta pruning method saves the search space. (10 Marks)

a. List various types of learning methods and briefly explain them. (10 Marks) b. With an example, discuss learning from decision trees. (10 Marks)

- Write short notes on the following:

 - a. Conjunctive Normal Form.
 b. Implementation issues in non monotonic reasoning.

 - c. EM algorithm.d. Goal based agents.

(20 Marks)

Second Semester M.Tech. Degree Examination, June/July 2015 **Web Services**

Max. Marks:100

Time: 3 hrs.

Note: Answer any FIVE full questions.

			Note: This wer any 111 L fait questions.	
	1	a.	Define the following terms:	
;			i) Middleware ii) Remote procedure call	
			iii) Object brokers iv) Message brokers	(04 Marks)
		b.	With a neat diagram, explain the development of a distributed application and	the results
			obtained for the RPC.	(08 Marks)
		C.	Explain the architecture of DCE provided by OSF.	(08 Marks)
	2	a.	Define TP monitors.	
	_	b.	Explain the architecture of a TP monitor.	(02 Marks)
		c.	What is MOM? Explain message based interoperability with an example.	(08 Marks)
			Explain message based interoperating with an example.	(10 Marks)
	3	a.	Define web service and name the different services what web provides.	(04 Marks)
		b.	Explain different aspects involved in web services description and discovery stack	.(08 Marks)
)		C.	With a neat diagram, explain in detail the overall internal and external middle war	es for web
			services.	(08 Marks)
	4	a.	Define WSDL and describe the goals of WSDL.	(04 Marks)
		b.	Describe how WSDL documents can be generated from API's and mention its use	(04 Marks)
				(08 Marks)
		C.	Give schematic view of UDDI registry entry of t model with an example.	(08 Marks)
	5	a.	List any four sets of APPs, whom elicate and the UPPs	
	5	b.	List any four sets of API's, where clients can access the UDDI registry. Write short notes on:	(02 Marks)
		0.	') WG 11	(00.34 1.)
		c.	Explain in detail, the central WS-coordination with relevant diagrams.	(08 Marks) (10 Marks)
			The state of the s	(10 Marks)
	6	a.	Define WS-coordination and mention the goals of WS-coordination.	(04 Marks)
		b.	Explain the components of WS-coordination and mention how WS-coordination	ation uses
			abstractions and defines different forms of interactions between a coordinate	or and its
			participants.	(08 Marks)
			Define different methods adopted to develop RosettaNet PIP specifications and ex	plain with
			a neat diagram RosettaNet PIP 3A2.	(08 Marks)
	7	a.	Define atomic transaction. Name the different protocols that makeup in atomic transaction.	saction
		1		(04 Marks)
		b.	With a neat diagram, explain state charts and Petri net formalizations of orchestrati	on model.
		c.	Explain fundamental alamenta of a male and a minimum in the second and a manufacture of a male and a male and a manufacture of a male and a male and a manufacture of a male and	(08 Marks)
		С.	Explain fundamental elements of a web service composition middleware.	(08 Marks)
	8	a.	Define the following terms:	
			i) Semantic web ii) DAML iii) OWL iv) DAML – S	(04 Marks)
		b.	Explain in detail component model and orchestration model of BPEL for web servi-	ces.
		c.		(08 Marks)
		· .	Name the web service management standards and explain	(08 Marks)

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