

International Islamic University Chittagong
Center for General Education (CGED)
Midterm Assessment, Autumn – 2021

Course Code: URBS – 4802
Course Title: Bangladesh Studies and History of Independence

Full Marks: 20

Time: 3:00 Hours

Answer any two of the following questions.

[All questions are of equal value]

1. Sketch out the location of Bangladesh on Latitude & Longitude and describe the country's river network. How can maximize the use of river resources for the sustainable development of the country?
 2. Evaluate the role of Sufism in the early spread of Islam and its contribution to the socio-cultural developments of Bangladesh. What are the major components of the composition of Muslim society in Bengal?
 3. Explain the comprehensive educational system in Bengal under Muslim rule (1204-1757). Compare its exclusive characteristics with the existing educational system in Bangladesh.
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International Islamic University Chittagong
Department of Computer Science & Engineering
B.Sc. in CSE Autumn-2021 Semester, Midterm Assessment
Course Title: Social, Professional and Ethical Issues in Computing
Course Code: CSE-4805, Full Marks: 21
Time: 2 hours 30 minutes for exam + 30 minutes for submission

Instructions to the Candidate: Answer All Three Questions

- | | | | | |
|----|----|---|-----|--------|
| | | | CO | DL |
| 1. | a) | Discuss the social, ethical and professional issues related to applications of computer in business. Identify some negative impact of computer in e-commerce sector in Bangladesh and suggest possible solutions. | 4.0 | CO3 C3 |
| | b) | A car company offers as an option a system that will detect a pedestrian in the path of the car, warn the driver, and brake the car if the driver does not respond. The option costs \$2000. If someone buys the car, does the person have an ethical obligation to buy the optional system to protect pedestrians? Discuss the impact of these options. | 3.0 | CO4 C4 |
| 2. | a) | A company planned to sell a laser device a person can wear around his or her neck that makes photographs taken of the person come out streaked and useless. The company marketed it to celebrities hounded by photographers. Suppose the device works well against surveillance cameras commonly used in public places and in many businesses. Suppose many people begin to use the device routinely when outside their homes. Suppose law enforcement agencies propose making its use illegal. Give arguments for and against such a proposal. | 3.5 | CO3 C3 |
| | b) | A very large social network company analyzes all data it gathers through its service on its members' activities to develop statistical information for marketers and to plan new services. The information is very valuable. Should the company pay its members for its use of their information? Discuss why or why not? | 3.5 | CO3 C3 |

3. a) Read the ICT act of Bangladesh carefully and high light the points that must know as a general Face book or Internet user. Give some recommendations that you feel to include or exclude in future amendment. 3.5 CO3 C3
- b) Bangladesh had only one cybercrime tribunal, in Dhaka, until seven more were formed to cover all the divisions. Records show 33 cases were filed with the tribunal in 2014 and the annual number rose gradually to 1,189 in 2019. People filed 1,128 cases amid the pandemic in 2020, and 447 until March 2021. Statistics shows that the number of crime increases very fast. Now as a computer science engineer, provides a roadmap for Bangladesh government so that better services regarding settlement of cyber crimes can be provided to the citizens in future. 3.5 CO4 C4

International Islamic University Chittagong

Department of Computer Science and Engineering

Mid-term Examination , Autumn-2021		Program: B.Sc. Eng. (CSE)		
Course Code: MGT-3601		Course Title: Industrial Management		
Time: 3 hours		Full Marks: 21+ 9 (Quiz/Viva)		
[Answer all <i>three</i> questions from the followings; figures in the right margin indicate full marks.]				
1(a).	Identify and briefly explain the four basic functions of management.	CO3	Ev	4
1(b).	Describe how a person become an skilled manager.	CO2	U	3
2(a).	What should be the elements to build a patient friendly internal culture in a hospital? Justify your viewpoints.	CO3	Ev	3
2(b).	Describe some adaptation strategies that a firm can use to cope with the changing environmental situations.	CO1	U	4
3(a).	What do you understand by ‘job specialization’? Is it essential in a manufacturing industry? Justify.	CO2	U/I	4
3(b).	Consider the following job. In your opinion, what should be the appropriate span of management? Describe the factors you considered in reaching your conclusion. An owner-manager of an auto body shop deals with customers, directs several experienced mechanics, and also trains and oversees the work of some unskilled laborers.	CO3	An	3
4.	Quiz	CO1	U	7

Answer all the questions

1. “The standardization efforts in databases developed reference models of DBMS”- in this point of view, What is the meaning of Reference Model? What are the different approaches for A reference Model? 4

Write down the Peer-to-Peer Architecture for DDBMS according to function-based approach. 3
2. What is Wrappers? Define Mediators along with its functionality. How could we map between Data sources and Global Schema. 3
Consider the following Data sources:- 4

SOURCE 1

Product(Code, Name, Description, Warnings, Notes, CatID)
Version(ProductCode, VersionCode, Size, Color, Name, Description, Stock, Price)

SOURCE 2

Product(Code, Name, Size, Color, Description, Type, Price, Q.ty)

According to the given data sources you need to create the Global as Views (GAV).

3. *LALuxuryHouses* is a real estate agency located in Los Angeles and its business is **exclusively** focused on luxury villas located in the Los Angeles area (State of California). Differently, *USAHouses* is an important real estate agency that rents and sells houses in all the main states of the USA. *USAHouses* wants to increase its business in Los Angeles. Since the Los Angeles area is currently only partially covered by the agencies of *USAHouses*, its management decided to buy *LALuxuryHouses* and founded a new company called *USARealEstateCompany*. The management of *USARealEstateCompany* (the new company) wants to integrate the information available in the two sources (*LALuxuryHouses* and *USAHouses*) in order to be able to query all the available data. 7

In the following we report the original relational schemas of the two sources.

LALuxuryHouses:

CLIENTS (SSN, Lastname, Firstname, Address, City, State, Age, PhoneNumber)

EMPLOYEE (IDEmployee, Lastname, Firstname, PhoneNumber)

HOUSES (HouseAddress, HouseCity, SizeSquareMeters, Rooms) // The size of each home is measured in square meters.

HOUSE-OWNEDBY (HouseAddress, HouseCity, ClientSSN) // Table House-OwnedBy is used to store the information about the owners of each house.

RENTAL-CONTRACT (IDRentContract, HouseAddress, HouseCity, StartDate, EndDate, AnnualCost, IDEmployee) // Each tuple in Table Rental-Contract represents the rental of a house (identified by the pair HouseAddress, HouseCity) for the period from StartDate to EndDate

RENTEDBY (IDRentContract, ClientSSN) // Table RentedBy is used to store who are the clients associated to each rental contract (i.e., who rented the house associated to the contract).

SALE (IDSaleContract, HouseAddress, HouseCity, Date, Cost, IDEmployee) // Each tuple in Sale corresponds to one sale.

SOLDTO (IDSaleContract, ClientSSN) // Table SoldTo is used to store who are the buyers associated to each sale.

USAHouses:

BUYERS (BuyerID, Name, Surname, Address, City, State, YearOfBirth, SSN, PhoneNumber)

// Each tuple in Table Buyers represents someone who bought or rented a real estate

OWNERS (OwnerID, Name, Surname, Address, City, State, YearOfBirth, SSN, PhoneNumber)

// Each tuple in Table Owners represents someone who owns a real estate

AGENTS (AgentID, Name, Surname, MobilePhoneNumber, OfficePhoneNumber)

REALESTATES (IDRE, Address, City, State, NumOfRooms, Size_SquareFeet, NumberOfFloors, OwnerID) // The size of each real estate is measured in square feet.

REALESTATE-RENTAL (IDRE, StartDate, EndDate, BuyerID, AgentID, MonthlyCost)

REALESTATE-SALE (IDRE, Date, BuyerID, AgentID, Price)

1. Provide, **for each** input data source, the reverse engineering from the logical to the conceptual schema (ER graph).
2. Design an integrated global conceptual schema (ER graph) for *USARealEstateCompany* capturing **all** the data coming from both *LALuxuryHouses* and *USAHouses*, and provide the corresponding logical schema.

International Islamic University Chittagong

Department of Computer Science and Engineering

Midterm Assignment, Autumn-2021

Course Code: CSE-4877 **Course Title:** Machine Learning and Data Mining

Total marks: **21** Time: **3** hours


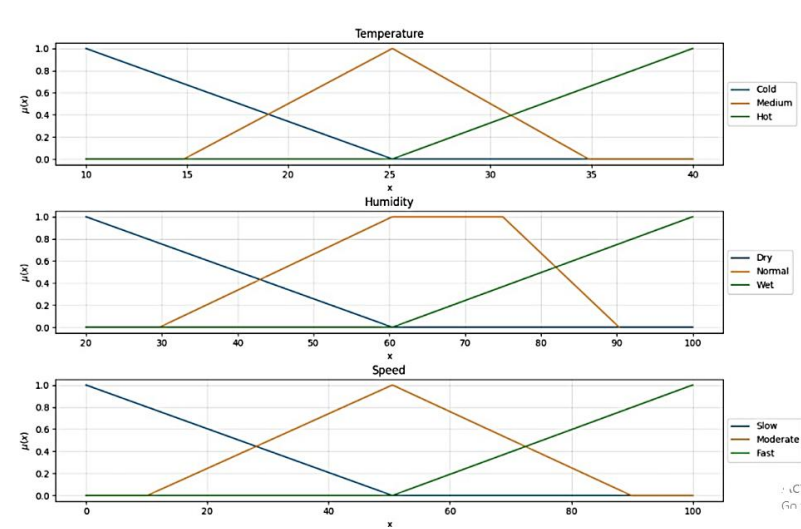
[Answer the following questions. Figures in the right-hand margin indicate full marks.]

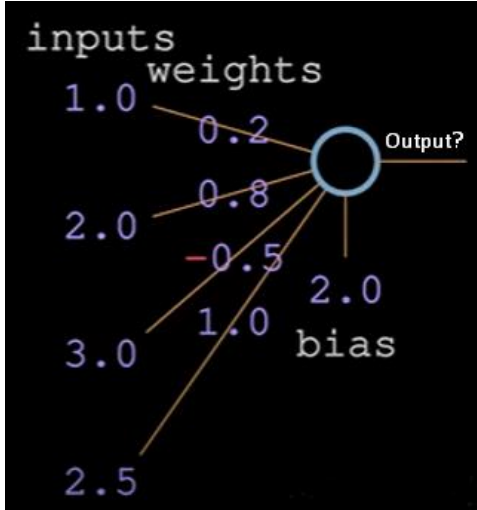
			CO	DL																																																		
1.a)	Discuss (shortly) whether each of the following activities is a data-mining task or not. i. Predicting the outcomes of tossing a (fair) dice. ii. Predicting the future stock price of a company using historical records. iii. Recommending field of studies for students. iv. Monitoring the heart rate of a patient for abnormalities.	2	CO2	C2																																																		
b)	Consider the following data: 12, 14, 15, 15, 18, 20, 20, 21, 22, 22, 25, 25, 25, 25, 30, 33, 33, 35, 35, 35, 35, 36, 40, 46, 47, 53, and 72. i. What is the mode of the data? Comment on the data’s modality. ii. Give the five-number summary of the data. iii. Show a boxplot of the data.	3	CO2	C3																																																		
c)	Consider the following data table containing Document Vector or Term-Frequency Vector: <table><tr><td>Document</td><td>teamcoach</td><td>hockey</td><td>baseball</td><td>soccer</td><td>penalty</td><td>score</td><td>win</td><td>loss</td><td>season</td></tr><tr><td>Document1</td><td>5</td><td>0</td><td>3</td><td>0</td><td>2</td><td>0</td><td>2</td><td>0</td><td>0</td></tr><tr><td>Document2</td><td>3</td><td>0</td><td>2</td><td>0</td><td>1</td><td>1</td><td>0</td><td>1</td><td>1</td></tr><tr><td>Document3</td><td>0</td><td>7</td><td>0</td><td>2</td><td>1</td><td>0</td><td>3</td><td>0</td><td>0</td></tr><tr><td>Document4</td><td>0</td><td>1</td><td>0</td><td>0</td><td>1</td><td>2</td><td>2</td><td>3</td><td>0</td></tr></table> Find the cosine similarity between Ddocument1 and Document3.	Document	teamcoach	hockey	baseball	soccer	penalty	score	win	loss	season	Document1	5	0	3	0	2	0	2	0	0	Document2	3	0	2	0	1	1	0	1	1	Document3	0	7	0	2	1	0	3	0	0	Document4	0	1	0	0	1	2	2	3	0	2	CO2	C3
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Document2	3	0	2	0	1	1	0	1	1																																													
Document3	0	7	0	2	1	0	3	0	0																																													
Document4	0	1	0	0	1	2	2	3	0																																													
2.	Apply the Apriori algorithm with a minimum support threshold of 50% to the following transaction database: <table><tr><th>TID</th><th>Items</th></tr><tr><td>T100</td><td>{I1,I2,I5,I6}</td></tr><tr><td>T200</td><td>{I2,I4,I6}</td></tr><tr><td>T300</td><td>{I2,I3,I5}</td></tr><tr><td>T400</td><td>{I1,I2,I4,I5}</td></tr><tr><td>T500</td><td>{I1,I2,I3}</td></tr><tr><td>T600</td><td>{I2,I3,I4}</td></tr></table> Find all the frequent item sets using Apriori algorithm.	TID	Items	T100	{I1,I2,I5,I6}	T200	{I2,I4,I6}	T300	{I2,I3,I5}	T400	{I1,I2,I4,I5}	T500	{I1,I2,I3}	T600	{I2,I3,I4}	7	CO3	C4																																				
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3.	Consider the following data table containing variables of mixed type. Show the dissimilarity matrix between the variables. <table><tr><th>Object Identifier</th><th>Test-1 (nominal)</th><th>Test-2 (ordinal)</th><th>Test-3 (numeric)</th><th>Test-4 (binary)</th></tr><tr><td>1</td><td>code-A</td><td>Excellent</td><td>440</td><td>1</td></tr><tr><td>2</td><td>code-B</td><td>Fair</td><td>220</td><td>0</td></tr><tr><td>3</td><td>code-C</td><td>Good</td><td>164</td><td>1</td></tr><tr><td>4</td><td>code-A</td><td>Excellent</td><td>121</td><td>0</td></tr></table>	Object Identifier	Test-1 (nominal)	Test-2 (ordinal)	Test-3 (numeric)	Test-4 (binary)	1	code-A	Excellent	440	1	2	code-B	Fair	220	0	3	code-C	Good	164	1	4	code-A	Excellent	121	0	7	CO3	C5																									
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3	code-C	Good	164	1																																																		
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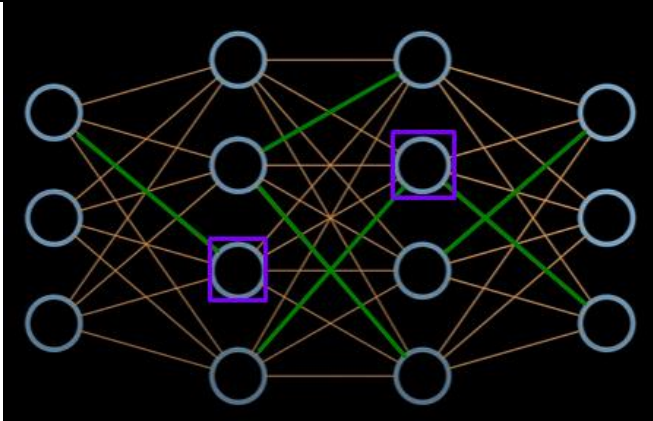
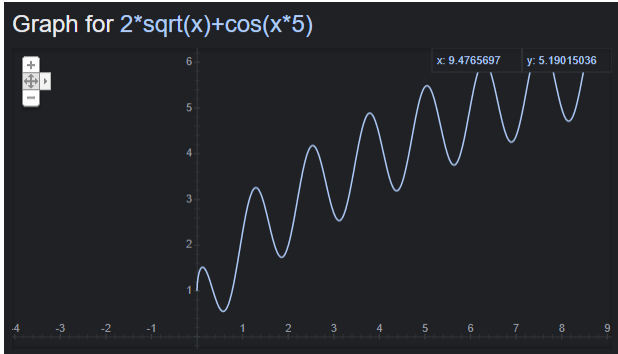
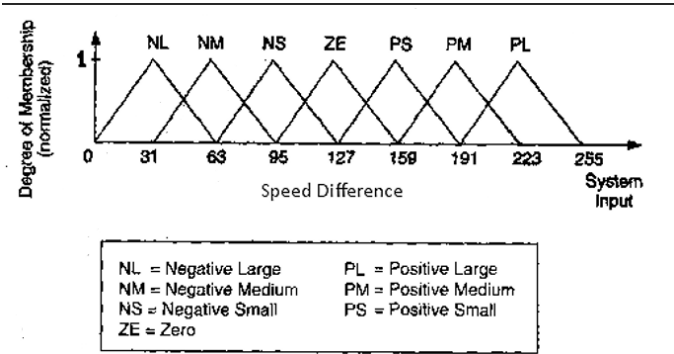
International Islamic University Chittagong
 Department of Computer Science and Engineering
Mid Term Examination, Autumn 2021
 CSE 4871 Neural Network and Fuzzy System
 SEC: 8BM

Total Marks: 21

Time: 3 Hours

			CO	DL
1	a)	<p>Find out the union and intersection of the following two fuzzy sets A and B where</p> <p>$A = \{(x_1, 0.8), (x_2, 0.6), (x_3, 1), (x_4, 0)\}$</p> <p>$B = \{(x_1, 0.3), (x_2, 0.7), (x_3, 0.5), (x_4, 0.2)\}$</p>	1 C01	C2
	b)	<p>Design a Fuzzy System where the environment's temperature and humidity control the speed of a fan. What would be the fan speed for the temperature of 18 degrees and humidity of 60%?</p> <div style="text-align: center;">  </div> <p>Given the linguistic variables</p> <p>Temperature: Cold, Medium, Hot</p> <p>Humidity: Dry, Normal, Wet</p> <p>Fan Speed: Slow, Moderate, Fast</p> <p>Below graphical representation of the temperature, humidity, and fan speed fuzzy sets</p> <div style="text-align: center;">  </div>	6 C02	C6

		<p>A total of nine rules are used to describe the knowledge necessary to operate our fan:</p> <p>If Temperature is Cold and Humidity is Dry Then Fan Speed is Slow</p> <p>If Temperature is Medium and Humidity is Dry Then Fan Speed is Slow</p> <p>If Temperature is Cold and Humidity is Normal Then Fan Speed is Slow</p> <p>If Temperature is Hot and Humidity is Dry Then Fan Speed is Moderate</p> <p>If Temperature is Medium and Humidity is Normal Then Fan Speed is Moderate</p> <p>If Temperature is Cold and Humidity is Wet Then Fan Speed is Moderate</p> <p>If Temperature is Hot and Humidity is Normal Then Fan Speed is Fast</p> <p>If Temperature is Hot and Humidity is Wet Then Fan Speed is Fast</p> <p>If Temperature is Medium and Humidity is Wet Then Fan Speed is Fast</p>			
2	a)	<p>For the following single neuron training model mathematically explain how the output will be calculated and on 1st iteration how weights will be optimized while real output value, $y = 5.3$?</p> 	5	C03	C5
	b)	<p>For the following fully connected neural network express the notation for the weights in green mark and function notation for the purple color box, where weight is expressed as w_{ij}^k and function denoted as f_{ij}.</p>	2	C03	C2

					
3	a)	<p>Mathematically explain how MLP could catch the pattern and linear regression fails for the following dataset.</p> 	4	C03	C4
	b)	<p>What's the membership function of the Speed Difference (SD) 80 for the following speed difference fuzzy set?</p> 	3	C01	C3

International Islamic University Chittagong

Department of Computer Science & Engineering

B.Sc. in CSE, Semester Mid Assignment, Autumn 2021

Course Code: CSE 4875 Title: Pattern Recognition and image processing

Total Marks: 21 Time: 3 hours

[Answer all the following questions]

1(a) “Many Image processing algorithms are developed for defense and security purpose” 2
– Do you agree with the statement? Explain your opinion.

(b) In some devices CCD based cameras are used where other use CMOS based 3
cameras”. Justify the significance of the statement and write the benefit of using both.

(c) Calculate the resolution of a 42” monitor working with 3072x2304 image. 2

2(a) Find the optimal threshold of the following image using Otsu method. 3

0	1	4	0
0	2	1	2
2	1	4	4
0	2	3	1

(b) A 4 x4 original image is given with 8 bits/pixel. 4

10	250	240	0
0	30	20	20
50	10	150	236
0	20	30	10

- Find the new image after **applying** contrast stretching.
- What are the pos and cons of contrast stretching and histogram equalization.

3(a) What is geometric processing? Briefly describe the different geometric operations. 2
Give necessary examples.

(b) A 4 x4 original image is given with 3 bits/pixel. 5

1	3	3	0
0	6	4	2
2	6	5	4
1	3	3	0

- Perform low pass and median filtering on the image (Use padding)
- Analyze the differences of both images.