

SCHOOL OF COMPUTER SCIENCE ENGINEERING AND INFORMATION SYSTEMS

CONTINUOUS ASSESSMENT TEST - II
FALL SEMESTER 2025-2026

SLOT: C2+TC2

Programme Name & Branch : B.Tech. IT
Course Code and Course Name : BITE410L
Faculty Name(s) : Dr. Chemmalar Selvi G. Dr. Balakrushna Tripathy,
Dr. Selva Rani B
Class Number(s) : VL2025260103203, VL2025260107351,
VL2025260103194
Date of Examination : 07.10.2025
Exam Duration : 90 minutes Maximum Marks: 50

General instruction(s):

- Answer All Questions
- M - Max mark; CO - Course Outcome; BL - Blooms Taxonomy Level (1 - Remember, 2 - Understand, 3 - Apply, 4 - Analyse, 5 - Evaluate, 6 - Create)
- Course Outcomes
CO1 - Understand the various machine learning approaches and data preprocessing techniques.
CO2 - Develop the learning models for the problems using supervised and advanced supervised learning-based approaches.

Q. No	Question	M	CO	BL																
1.	The exam dataset contains the exam result of 7 students with number of study hours. A logistic regression model is given with slope $\beta_1=0.6$ and intercept $\beta_0=-1.5$. <table><tr><th>Study Hours</th><th>Exam Result (Pass 1/ Fail 0)</th></tr><tr><td>2</td><td>0</td></tr><tr><td>3</td><td>0</td></tr><tr><td>4</td><td>0</td></tr><tr><td>5</td><td>1</td></tr><tr><td>6</td><td>1</td></tr><tr><td>7</td><td>1</td></tr><tr><td>8</td><td>1</td></tr></table> • Compute the predicted probabilities for each student. • Compute the probability of the exam result with the student studied for 5 hours. • Classify the results into Pass/Fail using a threshold of 0.5. • Construct the confusion matrix. • Compute Precision and Recall.	Study Hours	Exam Result (Pass 1/ Fail 0)	2	0	3	0	4	0	5	1	6	1	7	1	8	1	10	2	4
Study Hours	Exam Result (Pass 1/ Fail 0)																			
2	0																			
3	0																			
4	0																			
5	1																			
6	1																			
7	1																			
8	1																			
2.	Apply the Decision Tree Algorithm using ID3 and construct the	10	2	3																

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	decision tree for the given dataset? <table border="1"> <thead> <tr> <th>#</th><th>Study</th><th>Attendance</th><th>Project</th><th>Pass</th></tr> </thead> <tbody> <tr><td>1</td><td>High</td><td>Good</td><td>Yes</td><td>Yes</td></tr> <tr><td>2</td><td>High</td><td>Good</td><td>No</td><td>Yes</td></tr> <tr><td>3</td><td>High</td><td>Poor</td><td>Yes</td><td>Yes</td></tr> <tr><td>4</td><td>Low</td><td>Good</td><td>Yes</td><td>No</td></tr> <tr><td>5</td><td>Low</td><td>Poor</td><td>No</td><td>No</td></tr> <tr><td>6</td><td>Low</td><td>Good</td><td>No</td><td>No</td></tr> <tr><td>7</td><td>High</td><td>Poor</td><td>No</td><td>Yes</td></tr> <tr><td>8</td><td>Low</td><td>Poor</td><td>Yes</td><td>No</td></tr> </tbody> </table>	#	Study	Attendance	Project	Pass	1	High	Good	Yes	Yes	2	High	Good	No	Yes	3	High	Poor	Yes	Yes	4	Low	Good	Yes	No	5	Low	Poor	No	No	6	Low	Good	No	No	7	High	Poor	No	Yes	8	Low	Poor	Yes	No			
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7	High	Poor	No	Yes																																													
8	Low	Poor	Yes	No																																													
3.	Consider the dataset containing the following positively labeled data points : (4,1), (4,-1), (6,0) and negatively labeled data points: (1,0), (0,1), (0,-1). Identify the support vectors and determine the hyperplane to classify the given data points?	10	2	4																																													
4.	Assume the following training dataset for classifying whether a customer will Buy a product (Yes/No) based on three categorical features: Age (Young, Middle, Old), Income (High, Medium, Low), and Student (Yes, No). Apply the Naive Bayes Theorem to test the following data: ☐ Test A: Age = Young, Income = Low, Student = No ☐ Test B: Age = Middle, Income = Medium, Student = Yes <table border="1"> <thead> <tr> <th>ID</th><th>Age</th><th>Income</th><th>Student</th><th>Buy</th></tr> </thead> <tbody> <tr><td>1</td><td>Young</td><td>High</td><td>No</td><td>No</td></tr> <tr><td>2</td><td>Young</td><td>High</td><td>No</td><td>No</td></tr> <tr><td>3</td><td>Middle</td><td>High</td><td>No</td><td>Yes</td></tr> <tr><td>4</td><td>Old</td><td>Medium</td><td>No</td><td>Yes</td></tr> <tr><td>5</td><td>Old</td><td>Low</td><td>Yes</td><td>Yes</td></tr> <tr><td>6</td><td>Old</td><td>Low</td><td>Yes</td><td>No</td></tr> </tbody> </table>	ID	Age	Income	Student	Buy	1	Young	High	No	No	2	Young	High	No	No	3	Middle	High	No	Yes	4	Old	Medium	No	Yes	5	Old	Low	Yes	Yes	6	Old	Low	Yes	No	10	2	3										
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10	Old	Medium	Yes	Yes																				
5. a.	A single neuron receives three inputs: $x_1=2$, $x_2=1$, $x_3=3$ - Weights: $w_1=0.5$, $w_2=-0.4$, $w_3=0$. - Bias = 0.1 Compute the net input (z) and the output of the neuron using the sigmoid activation function.	5	2	6																				
5.b.	Compare and contrast between linear and logistic regression. Justify the need of logistic function in the logistic regression model?	(4 + 1)	2	2																				
