Question Paper

Exam Date & Time: 11-May-2023 (09:30 AM - 12:30 PM)

MANIPAL ACADEMY OF HIGHER EDUCATION

INTERNATIONAL CENTRE FOR APPLIED SCIENCES
END SEMESTER THEORY EXAMINATION-MAY 2023
IV SEMESTER B.Sc.(APPLIED SCIENCES) IN ENGG.

MACHINE LEARNING [ICS-237]

Marks: 50 **Duration: 180 mins.**

Answer all the questions.

Missing data, if any,may be suitably assumed.

1) Explain different types of evaluation method for machine learning model with an example? (10)

2) Compute m (estimated slope) for below housing datasets using Linear Regression? (3)

a)

b) Compute c (estimated intercept) for below housing datasets using Linear Regression? (3)

c) Compute R-Squared for below housing datasets? (4)

Sq.Feet	Price
1200	1900
1300	2200
1400	2400
1500	2600
1600	2700
1700	2900

3) Given the training data in the table below (Buy Computer data) predict the class of following newexample using Naïve Bayesclassification: age< =30, income=medium,student=yes, credit-rating=fair. (10)

RID	age	income	student	credit_rating	Class: buys_computer
1	<=30	high	no	fair	no
2	<=30	high	no	excellent	no
3	31 . . . 40	high	no	fair	yes
4	>40	medium	no	fair	yes

5	>40	low	yes	fair	yes
6	>40	low	yes	excellent	no
7	31 . . . 40	low	yes	excellent	yes
8	<=30	medium	no	fair	no
9	<=30	low	yes	fair	yes
10	>40	medium	yes	fair	yes
11	<=30	medium	yes	excellent	yes
12	31 . . . 40	medium	no	excellent	yes
13	31 . . . 40	high	yes	fair	yes
14	>40	medium	no	excellent	no

4) What are the advantages of using SVM over other machine learning algorithms? (5)

a)

b) How do you choose the optimal hyperparameters for an SVM model? (5)

5) Compute the Gini index for below given overall datasets. (3)

a)

b) Compute the Gini index for the Customer ID attribute for below given datasets. (3)

c) Compute the Gini index for the Gender attribute for below given datasets. (4)

Customer ID	Gender	Car Type	Shirt Size	Class
1	M	Family	Small	C0
2	M	Sports	Medium	C0
3	M	Sports	Medium	C0
4	M	Sports	Large	C0
5	M	Sports	Extra Large	C0
6	M	Sports	Extra Large	C0
7	F	Sports	Small	C0
8	F	Sports	Small	C0
9	F	Sports	Medium	C0
10	F	Luxury	Large	C0
11	M	Family	Large	C1
12	M	Family	Extra Large	C1