

## Data Mining (CS4038)

### Quiz No.3

Roll No: \_\_\_\_\_

Section: A

Date: 11-03-2024

#### Question No.1

(2\*4 = 8 marks)

Consider a binary classification problem (for car valuation) with the following set of attributes and attribute values:

- Maintenance cost = {Low, High}
- Ride Comfort = {Good, Bad}
- Seating Capacity = {5,4,2}
- Boot Capacity = {Low, High}

Suppose a rule-based classifier produces the following rules:

- Seating Capacity = 2  $\rightarrow$  Value = Low
- Seating Capacity = 5  $\rightarrow$  Value = High
- Maintenance Cost = low, Ride Comfort = Good  $\rightarrow$  Value = High
- Maintenance Cost = low, Ride Comfort = Bad  $\rightarrow$  Value = Low
- Maintenance Cost = High  $\rightarrow$  Value = High

Answer the following questions with justification:

- a) Are the rules mutually exclusive?

No ~~Yes~~, rules are <sup>not</sup> mutually exclusive

- b) Is the rule set exhaustive?

Yes

- c) Is ordering needed for this rule set?

Yes bcz rules are not mutually exclusive

- d) Is there a need for default rule?

No as rule set is exhaustive

**Question No.2****(10 marks)**

Consider the following training set in 2 dimensional Euclidean space:

X	Y	Class
-1	1	-
0	1	+
0	2	-
1	-1	-
1	0	+
1	2	+
2	2	-
2	3	+

What is the prediction of 3 nearest neighbor classifier at point (1,1)?

For (1,1)

$$(i) (-1, 1) = \sqrt{(1+1)^2 + (1-1)^2} \\ = 2.82$$

$$(ii) (0, 1) = 1 (+)$$

$$(iii) (0, 2) = 1.41$$

$$(iv) (1, -1) = 2$$

$$(v) (1, 0) = 1 (+)$$

$$(vi) (1, 2) = 1 (+)$$

$$(vii) (2, 2) = 1.41$$

$$(viii) (2, 3) = 2.23$$

According to majority voting predicted class of point (1,1) is '+'