Vidyavardhini's College of Engineering and Technology

Department of Artificial Intelligence & Data Science

AY: 2024-25

Class:	TE	Semester:	V
Course Code:	CSC504	Course Name:	DWM

Name of Student:	Sunit Sunil Khaire
Roll No. :	19
Assignment No.:	3
Title of Assignment:	~~Classification~~ Min max normalization
Date of Submission:	
Date of Correction:	

Evaluation

Performance Indicator	Max. Marks	Marks Obtained
Completeness	5	4
Demonstrated Knowledge	3	3
Legibility	2	2
Total	10	9

Performance Indicator	Exceed Expectations (EE)	Meet Expectations (ME)	Below Expectations (BE)
Completeness	5	3-4	1-2
Demonstrated Knowledge Legibility	3	2	1
Legibility	2	1	0

Checked by

Name of Faculty : Neha Raut

Signature :

Date :

Q.1)

Soln:- Given:- Let A be attribute income

$min_A = \$12,000$, $max_A = \$98,000$,

$V = \$73,600$

$new\_min_A = 0.0$, $new\_max_A = 1.0$

$$V' = \frac{V - minA}{(max_A - min_A) \cdot (new\_max_A - new\_min_A) + new\_min_A}$$

$$\therefore V' = \frac{73600 - 12000}{(98000 - 12000)(1.0 - 0.0) + 0.0}$$

$$\therefore V' = \frac{61600}{86000}$$

$$\therefore \boxed{V' = 0.7162}$$

$\therefore$ Income \$73,600 is transformed to 0.7162

Q.2)

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Fruit	yellow	Sweet	Long	Total
Orange	350	450	0	650
Banana	400	300	350	400
Others	50	100	50	150
Total	800	850	400	1200

$X = [yellow, sweet, long] = fruit$

(i) To check the probability of orange

(1) $P(\text{Yellow}|\text{Orange}) = \frac{P(\text{Orange}|\text{yellow}) - P(\text{Yellow})}{P(\text{orange})}$

$= \frac{\frac{350}{800} \times \frac{800}{1200}}{\frac{650}{1200}}$

$= \frac{350}{800} \times \frac{800}{1200} \times \frac{1200}{650}$

$= 0.538$

(2) $P(\text{Sweet}|\text{Orange}) = \frac{P(\text{Orange}|\text{Sweet}) \cdot P(\text{sweet})}{P(\text{orange})}$

$= \frac{\frac{450}{850} \times \frac{850}{1200}}{\frac{650}{1200}}$

$= 0.692$

(3) $P(\text{Long}|\text{orange}) = \frac{P(\text{Orange}|\text{Long}) \cdot P(\text{Long})}{P(\text{Orange})}$

$= \frac{\frac{0}{400} \times \frac{400}{1200}}{\frac{650}{1200}}$

$= 0$

$\therefore P(X=\text{orange}) = 0.538 \times 0.692 \times 0 = 0$

(ii) Similarly using Naive Bayes to check probability of Banana:-

(1) $P(\text{Yellow}|\text{Banana}) = \frac{\frac{400}{800} \times \frac{800}{1200}}{\frac{400}{1200}}$

$= 1$

② $P(\text{Sweet}|\text{Banana}) = \frac{\frac{300}{850} \times \frac{850}{1200}}{\frac{400}{1200}}$

$= 0.75$

③ $P(\text{LONG}|\text{Banana}) = \frac{\frac{350}{400} \times \frac{400}{1200}}{\frac{400}{1200}}$

$= 0.875$

$\therefore P(X = \text{Banana}) = 1 \times 0.75 \times 0.875 = 0.656$

(iii) Similarly using Naive Bayes to check probability of other ~~further~~ fruits :-

① $P(\text{Yellow}|\text{others}) = \frac{\frac{500}{800} \times \frac{800}{1200}}{\frac{150}{1200}}$

$= 0.333$

② $P(\text{Sweet}|\text{others}) = \frac{\frac{100}{850} \times \frac{850}{1200}}{\frac{150}{1200}}$

$= 0.666$

③ $P(\text{Long}|\text{others}) = \frac{\frac{50}{400} \times \frac{400}{1200}}{\frac{150}{1200}}$

$= 0.333$

$\therefore P(X = \text{Others}) = 0.33 \times 0.66 \times 0.33 = 0.071$

$\therefore$ By comparing all 3 probabilities; i.e.

$P(X = \text{Orange}) = 0$

$P(X = \text{Banana}) = 0.656$

$P(X = \text{Others}) = 0.071$

We conclude that

$P(\text{Banana}) > P(\text{Others}) > P(\text{Orange})$

$\therefore$ The fruit which is yellow, sweet & long is Banana.

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