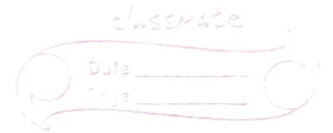


DA Assignment - 1



2019120008

Q1)

Attribute	OnTime	Late	VeryLate	Cancelled
Day:				
Weekday	$3/14 = 0.64$	0.5	1	0
Saturday	0.14	0.5	0	1
Sunday	0.07	0	0	0
Holiday	0.14	0	0	0

Season:

Winter	0.14	1	0.64	0
Autumn	0.14	0	0.33	0
Summer	0.43	0	0	0
Spring	0.29	0	0	0

Fog:

Normal	0.36	0.5	0.63	0
High	0.29	0.5	0.33	1
None	0.36	0	0	0

Rain

None	0.36	0.8	0.33	0
Slight	0.07	0	0	0
Heavy	0.07	0.5	0.64	1

Prior Probability	0.70	0.1	0.15	0.05
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Case 1

Class : On time

$$= 0.7 \times 0.64 \times 0.14 \times 0.23 \times 0.36 \\ = 6.577 \times 10^{-3}$$

Case 2

Class : Late

$$= 0.1 \times 0.5 \times 1 \times 0.5 \times 0.5 \\ = 0.0125$$

Case 3

Class : very late

$$= 0.15 \times 1 \times 0.67 \times 0.93 \times 0.33 \\ = 0.0103$$

Case 4

Class : Cancelled

$$= 0.05 \times 0.0 \times 0.0 \times 1 \times 0 \\ = 0$$

As the case 2 value is high,

∴ The instance will be categorized under class late

Q2

χ^2 test

degree of freedom : $(2-1) (2-1)$

Now,

$$\chi^2 = \sum_{i=1}^m \sum_{j=1}^n \frac{(a_{ij} - e_{ij})^2}{e_{ij}}$$

$$\chi^2 = \frac{[250 - 90]^2}{90} + \frac{[50 - 210]^2}{210} + \frac{[200 - 260]^2}{360} + \frac{[1000 - 840]^2}{840}$$

$$\chi^2 = 507.93$$

Degree of freedom = 1

$\therefore \chi^2$ value needed = 2.706

but 507.93 > 2.706

\therefore Null hypothesis of independence is rejected with a confidence level of 0.1.