DA Assignment-1

The classification technique that ean be (I)___ used to Map this tuple into an accurate class is 'Naire Bayes' Classifier. This is because we need to find the most likely classification. We assume each feature of the tuple makes an independent & equal contribution to the outcome With Naire Bayes we try to find the Maximum dikelihood Using Bayes theorem, P(yz|x,...,xn) = P(x,|y) P(x,|y) . P(xn|y) . P(y) $P(x_1) . P(x_2) ... P(x_n)$ For the given Airtraffic data.

There 20 tuples with

P(On time) = P(On time) = 14 = 07[14 instances P(date) = 2 = 0.1 [2 instances with class

20 as date]

P(very date) = 3 = 0.15 [3 instances with

20 elass Very date]

P(cancelled) = 1 = 0.05 [1 instance with

20 class cancelled] Probability with respect to each

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	J	/	0 //	,	•
	Finding	conditio	nal Po	robabilites f	109
	· each	altribute			
	F Paus	FOR Days	<u>.</u> .		
	Days	Ontime	Late	Very Late	Cornelled
	Weekday	9/14	1/2	Very Late 3/3	0/1
	Holiday	2/14	1/2	0/3	0/1
_) 11	Saturday		0/2	0/3	1/1
l'i	Sunday		0/2	0/3	0/1
	FOR J	Season:	1		
1. 15.	Season	ontime	date	Very date	Cancelled
	Spring	4/14	0/2	0/6	1/1
	winter	2/14	2/2	2/3	0/1
:	Summer	65/14	0/2	0/3	0/1
- 11(1)	Autumn	2/14	0/2	1/3	0/1
1 .	For Rain	L (*)	131		
	For Rain	On Time	tate	Very Late	Cancellod
	None	6/14	1/32	Very Late	Cancelled
	slight	6/14	1/2	20/3	0/1
	Heavy	2/14	0/2	2/3	1/1
	0			•	
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				Pope :	,
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	None	5/14	date	Very Late	Cancelled
	Hias	401	1/2	0/23	0/1
	tigh	48/14	1/2	1/3	
	Normal	5/14	1/2	2/3	1/1
			,	2/3	0/1
	Lot's	in al Le			
		the f	erobabil	ity has p	a clarati
	2	ind the f		7 100	ach case
	Case 11:	(Day = Week	dan		
	For =	High Rain	and 9	reason = Wir	ler
((of Day Tion	(Day = week High, Rain ne	= Non	e) = Instan	(e 18)
	PCIA	ne /		Ontimo	
	HOCK	Anetan	ce 1 =	P//12 along	
	PCE	Day = Wa	ab Day X	A AGEOR DOIS	.) •
		he / Instan Day = We	GRACIE &	· P	
	Can	Ф			
	Cocces	Let Instan = Winter OnTime	ce 1 =	(Dall = 1120)	- N
	Season	= 1Dinter	Fna =	Weel weel	Day
	Case 1:	Ontime	2	rugh, Rain	= None)
	P(On Tim	and T	,,,		
	D.C.	ne/ Instance	(1) = F	(On Time)	9
	- PC Day	= Week Day	/ ontin	10) · P/ ·	son = Winter/ Rain = None/
	ontime	P(Fod	= 11:04	Sea	son = Winter/
t lat	Onter	200	= rugh /	Ontime), P(Rain = None 1
	Grad	rio)	0.13		Note!
		0.7 x 9 x 2	- x 4 x	6 = 0.00	207.17
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	1 3 1	, , , , , , , , , , , , , , , , , , ,	19	,	
	0	1 1		1 . S . 1 . C . C . C . C . C . C . C . C . C	A . S . C
	Case 2. d	et Ins La	te		
	P (date /	Instance 1) = p(10/Da	y = WeekDay/ 0g = High/date)
	Note.). F	0 (80000 = 14	25 1	sace / P(ba	y = Neck Day/
-	0/0	slason - u	Jinter 1	date). P(F	09 = High 1807]
	PLRair	= None / 0 8	íate)		()
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		0 0	1 X	= 0.015	5
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C	ase 3: Very Late
F	(Nory Pate / Instance 1) = P (Vegy Late).
	PC & Day = Week Day / Vegy Late). P(e.
	Vory date). P(Rain = None / Vosy & d
	P(Fog = High / Very date)
	$= 0.15 \times 3 \times 2 \times 1 \times 1$
	2 Nery Late / Instance 1) = P(Very Late). P(& Day = WeckDay / Very Late). P(Leason = Winter) Very Late). P(Rain = None / Very Late). P(Fog = High / Very Late) = 0.15 × 3 × 2 × 1 × 1 3 3 3 3 = 0.01341
	= 0.01121
	Pase 4: Cancelled
	PC Causes Mad / 4 has a
	P(Pay = Weekday / Cancelled).
	P(Day = weekday / cancelled) · P(season =
	winter/ Cancelled). P(Roun Fog = High/ Cancelled). P(Rain = None/ Cancelled)
	(Concelled)
ì	$= 0.05 \times 0 \times 0 \times 1 \times 0 = 0$
	The Highest probability occurs for the
	case when of Next Late. Hence, when the Day is a Weekday, Season is winter, Fog is High of Rain is
	Season in Inintes Too in with the ori
	Nove the class is most likely to
	None, the class is most likely to
	and the same of th
2.1	& Given: & Sample size (n) = 1500
	7 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0 0
1	Contingency table Male Female Total
	fiction 250 (90) 200 (360) 450
- 7	non fiction 50(210) 1000(840) 1050
T.	data 300 1200 1500
-	The values in () are expected values.
	rypothesis:
	Ho: Prefferred Reading & gender are
	(17)
	II

independent of each other Ha: Prefferred Reading & gender are not independent of each other Lest on the given data to test the Hyspothesis x²= Sett S(Oij - eij)² where Oij = Observed i=1 cij frequency eij = Expected rows & colorimns respectively. $\frac{1-\chi^2 = (250-90)^2 + 2805 (50-210)^2}{90} + \frac{210}{(200-360)^2} + \frac{210}{(1000-840)^2}$ $= (160)^{2} + (-160)^{2} + (-160)^{2} + (160)^{2}$ z 507·93650 composing Pegree of freedom Here m=2, n=2: Pegree of freedom = (2-1)x(2-)=1Value X2 with degree of freedom I and

	001 significance level from the standard statistical table is 6.635
	statistical table is 6.635
	A Natural la > 6.635
	ux reject the null hypothesis that
	& Protesand reading & sender are
_	we reject the null hypothesis that & Preferred reading & gender are independent of each other Hence,
_	consolution that Gonden and
+	Parlaced 1000 dies 000 1 8 to proceeding
1	Concluding that Gender and Preferred reading are strongly correlated with each other.
+	correlated with Each ourter
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