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CSE176 Homework #1
#7
      P[D] = 0.05 = 7 Athletes use drugs
       P[D'] = 1 - 0.05 = 0.95 = 7 Athletes don't we drugs
       P[FP] = 0.02 => false positive
       P[FP'] = 0.98 =7 True positive
       P[FN] = 0.15 =7 false Negotive
       P[IN'] = 0.85 =7 True Negative
   1.) P[DIFP'] = P[FP'|D] P[D] = 1(0.98)(0.05)-(0.05) = 0.0025 or
                                                 (0.98
                             P[FP']
   a.) P[D'|FN'] = P[FN'|D']P[D'] = ((0.85)(0.95)) (0.95) = 0.9025 or
                                      (0.85)
                                                             1 90.25%
                            P[FN']
ise # 2
     1) Ri(x) = Z = 1 Xix P[Cx12]
        Choosing class: arg min K=1,111,K RK(Z)
     2.) argmaz { p(C, (x), ''', p((x/x), 1- ) z, }
           Dai P(CIIX) 7 P(Calx)
      3.) R_1(x) = 1 - P(C_1|x)
       1.) Las = 0.99 ble This will makes us choose class 1
          always unless P(C21x) 7.99
erclie #3
           Association Pule
                                                     Confidence
                                     support
                                    \frac{3}{6} = \frac{1}{2}
                                                      3/5
          meat - P Avocado
                                    3/6 = 1/2
                                                     3/4
          avocado - MEAT
                                                    2/з
                                   <sup>2</sup>/6 = 1/3
          yogurt - P Avocado
                                                    \frac{2}{4} = \frac{1}{2}
                                   2/6 = 1/3
         avocado - o yogurt
                                   2/6 = 1/2
                                                    2/5
         meat - > yoqurt
                                   2/6=1/2
                                                   ^{2}/3
         yogurt - MEAT
          The best rule to use is
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xercise #9	0 = 0.				1				entale et a a recorde latte deligna est haragente de calenda describer.
1.		predicted	INO predic	ted yes	1	_ (FF	+ FN)	= <u>0+2</u> 5	= 2 =
	Actua (No	1	Q	and the second of the second o	3	4010	2 (
	Actual Yes		2		2	Classifi	cation en	01: 40%	
		1	4						
	0 = 0.7	age der der til er ett distantif attimiset given var etter etter attimiser en managelene							
		predictedNo	predicted y	les				en det samme de arche se en c'h regelsgent printarioner (en part en eus en et alle fant	
	Actual NO	1	2	_ 3	3	1+a =	3		
	Actual yes	1	1	12				6.1	
	1	2	3		Clas	ssification	errol	1 60 %	
	0=0.5			<u>1</u>					
		predicted No	predicted y						
	Adrial NO			$\frac{3}{2}$		5	= 1		
	Actual Yes	0	<u>2</u> 3	12				' > - 0/	
	0.0	2	<i>J</i>		Class	sifica tron	error	120 %	
	0 = 0.9	predicted NO	Dadided U	25					
4	Artual NO	0	3	3		3+1	4		
	Actual yes	1	1	2		3+1 =	5		
		1	4					: 80 °	1
/	0 = 0.2					s (quarton)	0,107	. 00	/ 0
		redicted No	preduted up						
	Actual NO	3	0	3	***************************************	0_	- º/	C.	
	Actual yes	0	2	12	and the second s	5	0/0	Classificat	ion error
		3	2			takin takaken menin seli mataka kan interaktionan mentengan fisika jan	er wer in lighte for the self-control flee defining describes a set as		or frame automorphic and the control of the control
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2.)	+ POC CI								
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Exercise #5 Classifier A has fpa, tpa E [0,7] fpa 7 tpa Classifier B has fport po E [0,1] tpo 7 fps The point is located above the diagonal on the RUC space. f_{p} -rate = $\frac{t_{p_{B}}}{n}$ tp-rate = tpB #6 $\Theta = \{\Theta_1, \Theta_2, \Theta_3\} \subset \mathbb{R} \quad x \in \mathbb{R}$ h (x; 0) = 01 + 02 sin 2x + 03 sin 4x EIR E(h; 0) = N Zn=1 (yn-h(xn))2 $E(N,\Theta) = \left(\frac{1}{N} \sum_{n=1}^{N} (y_n - \theta_1 + \theta_2 \sin \alpha x_n + \theta_3 \sin \alpha x_n)^2\right) \frac{\partial \Theta}{\partial x}$ 2 2 n=1 ()n-O1+02 Sindan + O3 Sindan) (2(cs(2x)). (4cos(4x 16 cos(220) cos(420) 2n=1(yn-O1+O2 sin2xn+O3 sin 4xn) $h(x)\theta_1,\theta_2,\theta_3 = \theta_1 \chi^2 + \theta_2 \chi + \theta_3$ $D = A^{-1}y / A = 1$ $\frac{1}{N} \sum_{n=1}^{N} \chi_n$ $\frac{1}{N} \sum_{n=1}^{N} \chi_n \frac{1}{N} \sum_{n=1}^{N} \chi_n^2$ 12n 7n 12n 7n 12n 7n2 12n=7 xn3 $J = \left| \frac{1}{N} \sum_{n=1}^{N} y_n \right|$ 0 = A - 1 y multiply y $\frac{1}{N} \frac{1}{2} \frac{N}{n} \frac{y_n x_n}{x_n}$ $\frac{1}{N} \frac{1}{2} \frac{1}{n-1} \frac{1}{2} \frac{1}{n} x n^2$

$$\int_{0}^{2\pi} \frac{1}{N} \sum_{n=1}^{N} f(x_n) dx = \frac{1}{N} \sum_{n=1}^{N} \int_{0}^{2\pi} f(x_n) dx$$

Kercise #7

$$x \in \{0,1,2,3,\dots \}$$
 Poisson Distribution $w \mid mass fun$

$$P(x \mid \theta) = \frac{e^{-\theta} \theta^{x}}{x!}$$

1.)
$$z = \int_{\infty}^{\infty} p'(x) dx$$
 $\Rightarrow p'(x) = \lim_{n \to \infty} p(x+n) - p(x)$

$$h \to 0 \qquad h$$

$$\frac{2x=0}{0} = \frac{(hop)}{h+0} = \frac{(im)}{h+0} = \frac{p'(x+h) - p'(x)}{h+0} = 0$$

2.)
$$\mathcal{L}(\Theta;\chi) = \log \prod_{n=1}^{N} P(x_n; \Theta) = \xi_n = \log P(\chi_n; \Theta)$$

2.)
$$\mathcal{L}(\widehat{\Theta}_{i}\chi) = cog \prod_{x=1}^{n-1} cog \left(e^{-\Theta}\widehat{\Theta}^{\chi}\right) - log(\chi!)$$

3.) $\mathcal{L}_{n=1}^{n} log\left(\frac{e^{-\Theta}\widehat{\Theta}^{\chi}}{\chi!}\right) = \mathcal{L}_{n=1}^{n} log\left(e^{-\Theta}\widehat{\Theta}^{\chi}\right) - log(\chi!)$

$$= \underline{Z}_{n=1}^{N} \quad \log(e^{-\theta}) + \log(\theta^{x}) - \log(x!)$$

$$= \frac{2}{n} = 1 - \theta \log(e) + x \log(\theta) - \log(x!)$$

EXERCISE + 8 DE[0,1] RE{0,13 Binary Random Vector i P(x; 0) = TTd=1 Odd (1-0d) 1-xd $P(x; 0) = 0^{x} (1-0)^{1-x}$ The second of t 1.) $\frac{2 \times n - \eta - 2 \times n}{\theta} = 0 \sim \theta \frac{(1-\theta) 2 \times n - \epsilon(\eta - 2 \times n)}{\theta(1-\theta)} = 0$ 11-0) 2 xn - 0(n-2xn)=2xn-02xn-n0+02xn=0 ~ 2xn-02xn=n0-02xn ら= たえxm Bernoulli a.) g x (x) = p(x | Cx) p(Cx); gx (x) = W = x + W x o or gk(x) = (og p(x 1Cx) + (og p((K)) rule w'x + w. 70 3.) P(x 1Ck) . T(k = g x(x) π & Tld=1 θ d (1-01) 1-xd 4.) w x + w > >0

