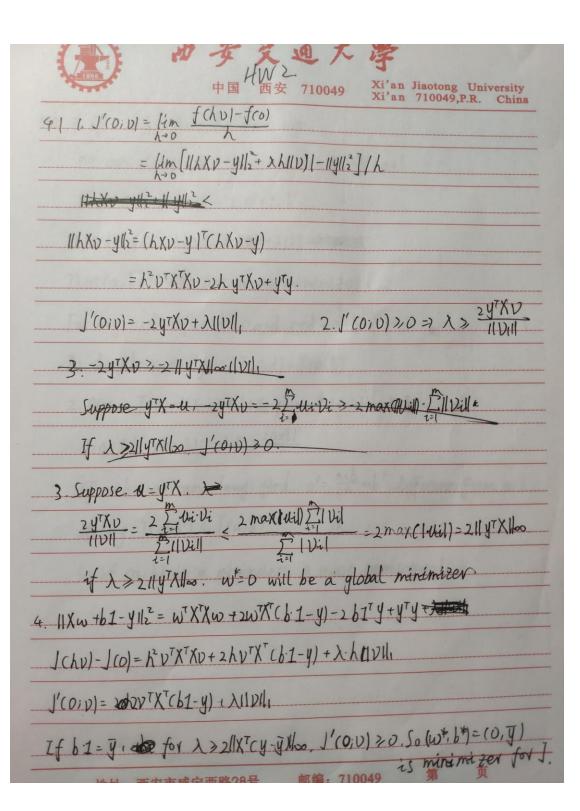


| 3.2 1. Reformulate the loss function w.r.t. wj.  |
|--|
| J(wj)=11wj. X. + X'. w'- y1/2 + 21wj1 + 21w'14   |
| If X.1j=0, Jauj1=11X'w'-y112+11wj1+11w'111   |
| So. wj=0 is the minimizer of J(wj).  |
| 2. Jauj = wj/1X.j/12+2wjX.j (X'w'-y)+11Xw-y1/2+21wj/+211w/12   |
| 3. If wj>D, J'(wj)= 2wj  X.ij  3+2X.ij(X'w'-y)+1   |
| If wy < 0, J'(wy)=2wy    X. ij     2 X. ij (X'w-y) - )   |
| If both these terms are (ess than 0, $w_j = \frac{2X \cdot i_j (X \cdot w' - y) + \lambda}{1 X \cdot i_j  ^2}$ ) o  If both they are bigger than 0. $w_j = \frac{2X \cdot i_j (X \cdot w' - y) + \lambda}{1 X \cdot i_j  ^2}$ If 0 is between them the $w_j = 0$ .  4. If thouse Shown in 3. |
| 世紀   |



We can always find a'+b' >0 and 'a'+b'=a+b.

I a+ I'b = I (a+b) = I a'+ I'b'.

2) a' 1+ 216'1 = 2) atb & 2) a| +2161 = 2) atb

Thus (a, b, Y) can not be a minimizer.

For any c.d. if c.d ? o and ctd = atb.

As the above analysis, Icc,d)=I(a,b)

2 Note J(0)=||X1a+x2b+X7.Y1l2+ (xca+b)+X7.Y.

 $x_1a+x_2b=x_1(a+b), a^2+b^2 > \frac{(a+b)^2}{2}$ 

If  $a \neq b$ , we can always find  $a' = \frac{a + b}{2} = b'$  different from  $a \cdot b$ , letting  $J(a',b') \leq J(a \cdot b)$ .

So if (a, b) is a minimiser, a must exploqual b.

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