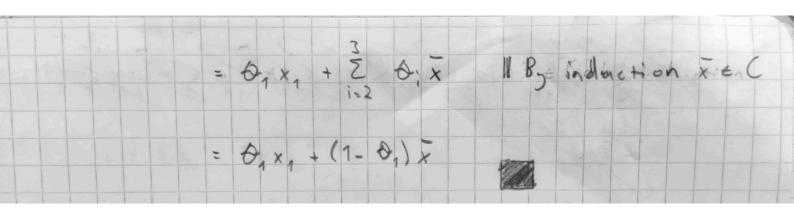
CS-E4830 Arth Hakkines Assignment 3 506077 Question ? Let f(.) = 11.11: 12 + 12+ So, of is a norm tonetion on R", which by definition is non-negative and homogeneous. f is a convex function iff it is sub-additive. Proof. f(0x+(1-0)y) = f(0x) + f((1-0)y) 11+0:00 12 incq. = 0 f(x) + (1-0) f(y) | labs. homogeness Question 2 A set C is convex and x: & C, for i = \(\) 1,2,3\(\) 0; \(\) 0, for i = \(\) 1,2,3\(\) and since \(\) + \(\) = 1, D: 51 500 1 = \$1,2,33 Then also & D:x: & C. Proof. We can proved the above claim by induction. E 0; x1 = 0, x, + 02 x2+ 03 x3 $= 0, \times, + \sum_{i=2}^{2} \theta_{i} \left(\frac{\theta_{2}}{\theta_{2} + \theta_{3}} \times_{2} + \frac{\theta_{3}}{\theta_{2} + \theta_{3}} \times_{3} \right)$



a) Lp= 1 w w + (E &; - E x (y; (w d(x) + b) - 1 + &;) - E M &; - Za; 5: - [M: 5: b) alp = w - \(\int \alpha; \beta(x;) = 0 w = Zx; y; b(x;) dle = - \(\infty \); = 0 ξα; 5: = 0 DLP = \(\(\cdot C = (x: + m:) c) We substitute the K.-T. - K. conditions into prinal Lagrangian, to get the dual form of L-SVM as $L_{p} = \frac{1}{2} w^{T} w - w^{T} \cdot \sum_{i} \alpha_{i} y_{i} \phi(x_{i}) - \sum_{i} \alpha_{i} y_{i} b + \sum_{i} ((-(\alpha_{i} + \mu_{i})) \xi_{i})$

= \(\zeta_i - \frac{1}{2} w^T w

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