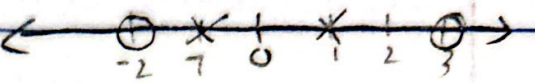
Spring 2015 midterm-1 | Fall 2014 midterm-1 just change -3 to -2

Q4] SVM

x -> +1
o -> -1



a) Dual formation

$\Rightarrow -\alpha_1 + \alpha_2 + \alpha_3 - \alpha_4 = 0$, s.t. $\alpha_i \geq 0$

$$L(\alpha) = \alpha_1 + \alpha_2 + \alpha_3 + \alpha_4 - \frac{1}{2}\left[\alpha_1^2 + \alpha_2^2 + \alpha_3^2 + \alpha_4^2 (9) - 2\alpha_1\alpha_2 + 4\alpha_1\alpha_3 - 12\alpha_1\alpha_4 - 2\alpha_2\alpha_3 + 6\alpha_2\alpha_4 - 6\alpha_3\alpha_4 \right]$$

b) No, Because Data is not linearly seperable. Point (3, -1) should be on other side or (-2, -1) vice versa.

c] plz refer to Q3 fall 2020

d) Yes, Quadratic Kernel can seperate the dataset. This is beause now sign of the data points does not matter so, $(-2)^2$, $(3)^2$ can be seperated from $(-1)^2$, $(1)^2$ (technically its $(1 + x^T x)^2$)

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