You know LDA/Fisher. Consider a two class problem with two samples $((2,3),+)$ and $((3,4),-)$. S_w is regularized as $S_w + \sigma I$. The LDA solution $\mathbf{w}^*$ will be:

(A) **[Ans]** along the direction of $(2,3)$ and $(3,4)$

(B) orthogonal to the direction of $(2,3)$ and $(3,4)$

(C) neither along nor orthogonal to

(D) **[Ans]** If we have not regularized, S_w would have become a NULL matrix.

(E) None of the above.

You know LDA/Fisher. The goal is to:

(A) **[Ans]** maximize inter class scatter

(B) minimize inter class scatter

(C) maximize within class scatter

(D) **[Ans]** minimize within class scatter

(E) Any two of the above.

You know LDA/Fisher. There are two classes ω_1 and ω_2. $d = 4$. Both are multivariate Gaussians with $\Sigma = I$. There are 50 and 100 samples from these two classes respectively. i.e., $N = 150$. The rank of S_B is

(A) **[Ans]** 1

(B) 2

(C) 150(N)

(D) 4 (d)

(E) None of the above

You know LDA/Fisher. There are two classes ω_1 and ω_2. $d = 4$. Both are multivariate Gaussians with $\Sigma = I$. There are 50 and 100 samples from these two classes respectively. i.e., $N = 150$.

What is the rank of S_w is:

(A) 2

(B) **[Ans]** 4

(C) 1

(D) 100

(E) 150

You know LDA/Fisher for two class classification problem. We know the problem as solving for:

$$S_b u = \lambda S_w u$$

and the solution as:

$$u^* = \alpha S_w^{-1}[\mu_1 - \mu_2]$$

(A) **[Ans]** Both S_B and S_w are of $d \times d$.

(B) Given the problem statement, we can write $S_b = \lambda S_w$. Or one matrix is the scaled version of the other.

(C) There is one and only one u that satisfy the problem. (or solution to the problem is unique).

(D) u^* is obtained by solving our problem with an additional constraint of $||u||_2^2 = 1$

(E) None of the above.