Solution for Exam 2009 Problem 6

ANYM, 20191111

We consider a Linear Discriminant Analysis with 3 or more groups.

An overall test for the null hypothesis “all group means are equal” is best tested by?

1) **Three Hotellings T2 in the one-sample case**

   We would then test the means against a specific value.

2) **Three Hotellings T2 in the two-sample case**

   We could do this, but we would get three test-statistics and thus run into a multiple comparison situation. It is more efficient if we have a single test-statistic.

3) **A multivariate one-sided(way) analysis of variance**

   This is the most sensible, as it tests exactly what we want. See section 4.3.1 page 302

4) **A multivariate two-sided(way) analysis of variance**

   This does not make sense, as we only have one parameter describing the mean, i.e. the groups.

5) **A test for equality of the last three eigenvalues of the covariance matrix**

   This is what we do in PCA to see if we should include more components. See theorem 6.8, page 375