Lab 3 : Geometric (LDA) & Probabilistic (QDA) Classification
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Objective: apply and compare the quality of the results of geometric and probabilistic discriminant analysis.

The code to be generated in this lab is Python code.

The data is in the farms.txt file.

We keep the financial ratios as explanatory variables:
       stockholders' equity / invested capital [r2]
       short-term debt / total debt [r3]
       long and medium-term debt / gross product [r7]
       short-term debt / circulating asset [r14]
       financial expenses / total debt [r17]
       financial expenses / gross product [r18]
       financial expenses / EBITDA [r21]
       (EBITDA - financial expenses) / gross product [r32]
       immobilized assets / gross product [r36]

1. Apply the LDA method. Determine the linear discriminant function $\Delta_{2/1}(x) = \beta 0 + \beta'x$

2. Calculate the scores of 1260 farms.

3. Propose a graphical representation and interpret this graph according to the initial variables

4. Apply the QDA method.

5. Get the posterior probabilities for each farm. How are these probabilities?

6. Which method performs better?