DD2427 - Exercise Set 7

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Question 2

We have defined :

$$C = \frac{1}{n}.X_c.X_c'$$
$$C_1 = \frac{1}{n}.X_c'.X_c$$

Let v be an eigenvector of C_1 with corresponding eigenvalue λ.
Let $V_1 = X_c * v$. We have :

$$\begin{aligned} C_1.v &= \frac{1}{n}X_c'.X_c * v \\ \Leftrightarrow \lambda v &= \frac{1}{n}X_c'.v_1 \\ \Leftrightarrow \lambda X_c.v &= \frac{1}{n}X_c.X_c'.v_1 \\ \Leftrightarrow \lambda v_1 &= C.v_1 \end{aligned}$$

Then v_1 is an eigenvector of C with corresponding eigenvalue λ.