1. Draw the pictures below of Wine-data (wine_and_olivetti.py) using scaled coordinates.
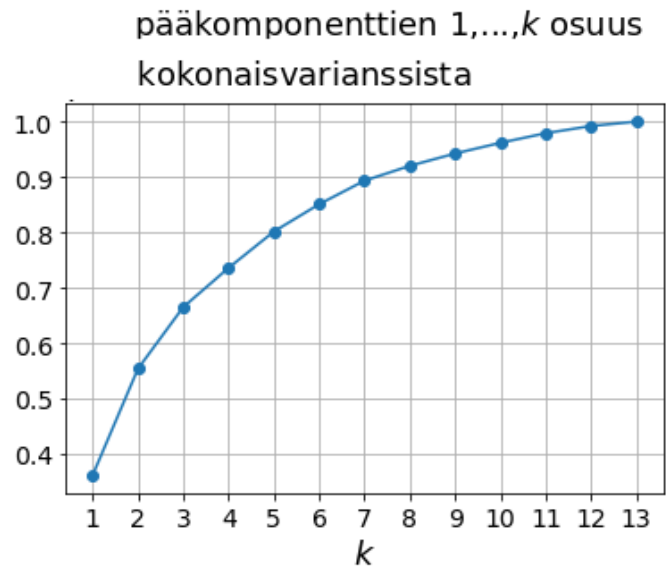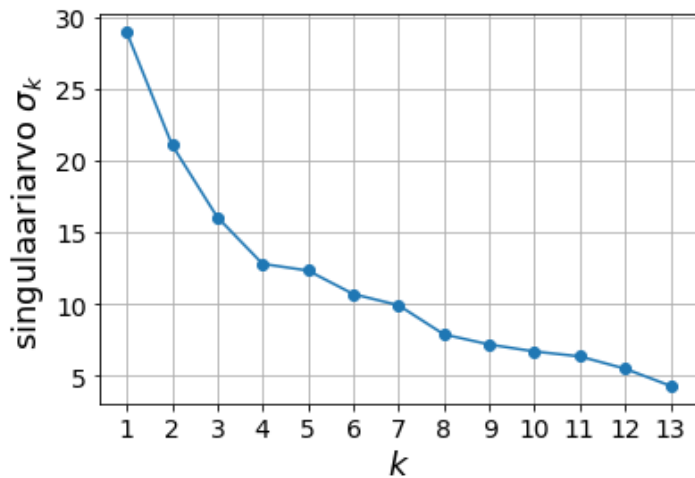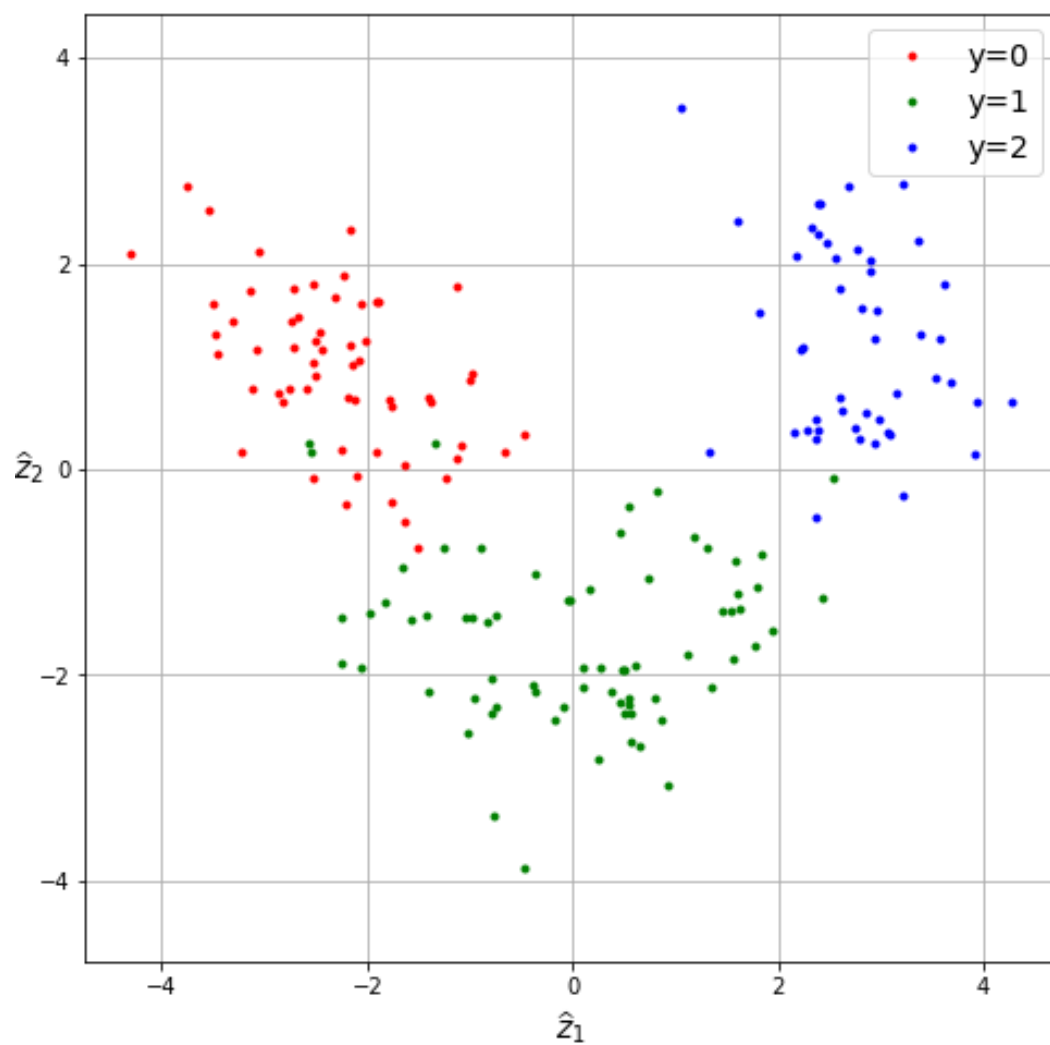
Singular values and the explained variance of principal components $1...k$

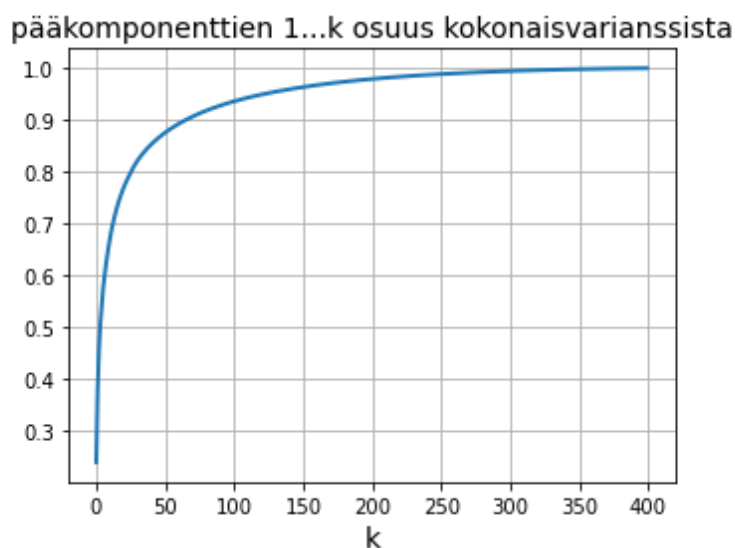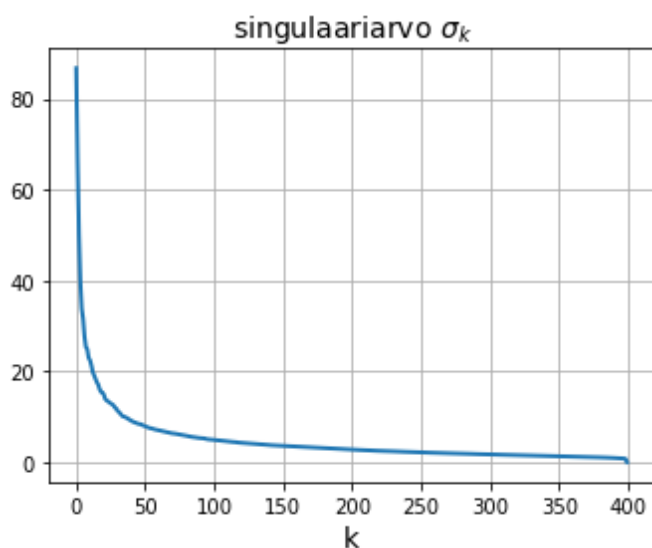# Picture using first two principal components $\widehat{z}_1$ and $\widehat{z}_2$

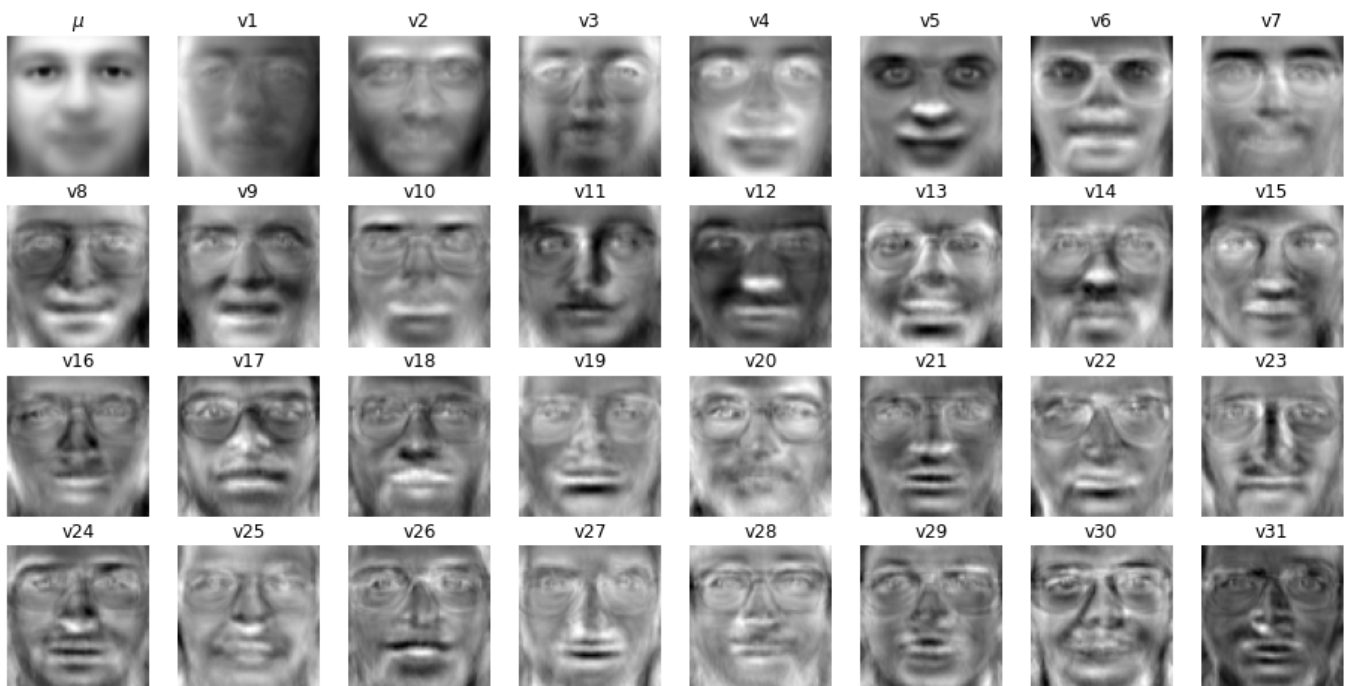**2.** Draw the pictures below of the Olivetti-data
(wine_and_olivetti.py)

One face of each person

Singular values and the explained variance of the principal components $1...k$

Mean μ and first 31 principal component vectors $\mathbf{v}_1, \mathbf{v}_2, \ldots, \mathbf{v}_{31}$

Face and it's approximations using principal components $1...k$