# Restricted_Boltzmann_machine

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In [1]: #RBM- Restricted Boltzmann machine A restricted Boltzmann machine is a
        #generative stochastic artificial neural network that can learn a probability
        #distribution over its set of inputs.

        from sklearn import preprocessing
        from sklearn.neural_network import BernoulliRBM
        from sklearn.datasets import fetch_olivetti_faces
        import matplotlib.pyplot as plt
        import numpy as np

        def rbm(dataset, n_components):
            X = preprocessing.binarize(preprocessing.scale(dataset.data.astype(float)), 0.5)
            rbm = BernoulliRBM(n_components = n_components, learning_rate=0.01, n_iter=100)
            rbm.fit(X)
            plt.figure(figsize=(4.2,4))
            for i, comp in enumerate(rbm.components_):
                plt.subplot(int(np.sqrt(n_components+1)),
                            int(np.sqrt(n_components+1)),i+1)
                plt.imshow(comp.reshape((64,64)),cmap=plt.cm.gray_r,
                           interpolation='nearest')
                plt.xticks(());plt.yticks(())
            plt.suptitle(str(n_components)+' Components generated by RBM', fontsize=16)
            plt.subplots_adjust(0.08,0.02,0.92,0.85,0.08,0.23)
            plt.show()
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In [2]: olivetti_faces = fetch_olivetti_faces()
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In [3]: rbm(olivetti_faces, 64)
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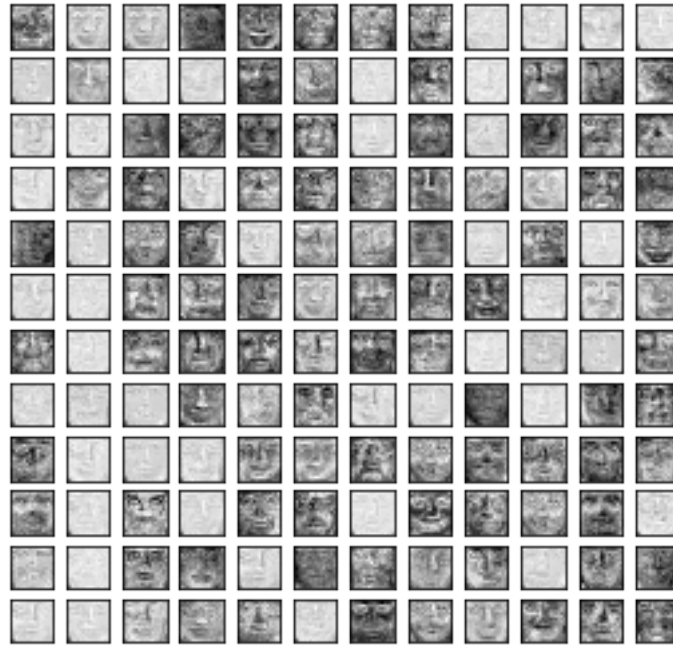
64 Components generated by RBM


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In [4]: rbm(olivetti_faces, 100)
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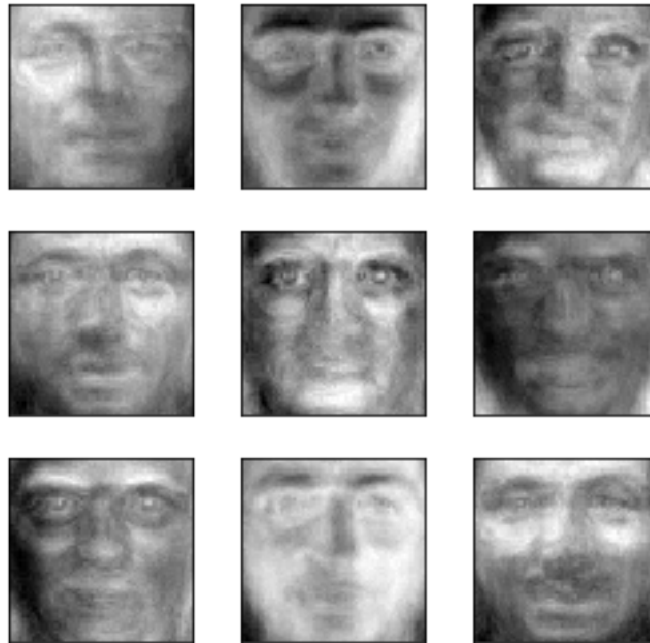## 100 Components generated by RBM
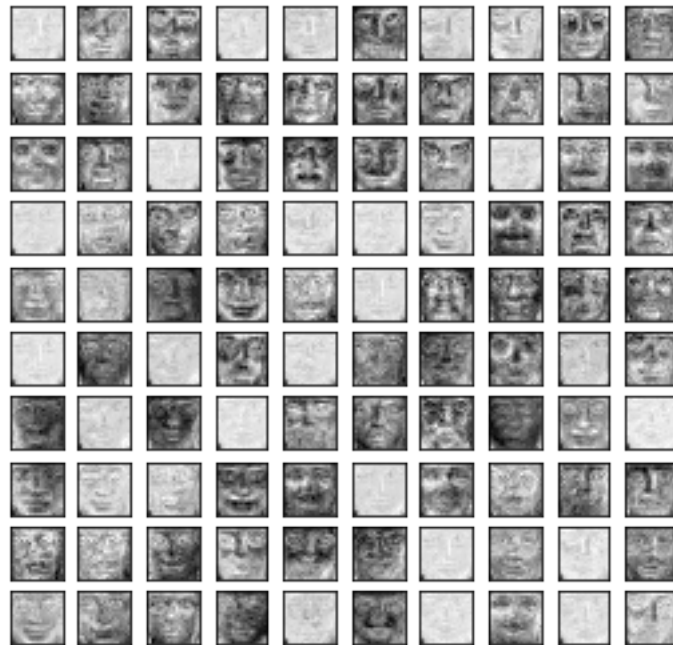

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In [5]: rbm(olivetti_faces, 144)
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144 Components generated by RBM


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In [9]: rbm(olivetti_faces, 9)
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9 Components generated by RBM

In [ ]: