Larson Hogstrom
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definition For a nonnegative matrix $A \in \mathbb{R}^{mxn}$, select a low-rank approximation of size k such that there are two nonnegative matrices $\mathbf{W} \in \mathbb{R}^{mxk}$ and $\mathbf{H} \in \mathbb{R}^{kxn}$ which minimizes a function such as

$$f(\mathbf{W},\mathbf{H}) = \frac{1}{2}||\mathbf{A} - \mathbf{WH}||_F^2$$