

## 4 Discovering interpretable features

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In this chapter, you'll learn about a dimension reduction technique called "Non-negative matrix factorization" ("NMF") that expresses samples as combinations of interpretable parts. For example, it expresses documents as combinations of topics, and images in terms of commonly occurring visual patterns. You'll also learn to use NMF to build recommender systems that can find you similar articles to read, or musical artists that match your listening history!

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|--|--------|
| ▶ Non-negative matrix factorization (NMF)              | 50 xp  |
| ≡ Non-negative data                                    | 50 xp  |
| </> NMF applied to Wikipedia articles                  | 100 xp |
| </> NMF features of the Wikipedia articles             | 100 xp |
| ≡ NMF reconstructs samples                             | 50 xp  |
| ▶ NMF learns interpretable parts                       | 50 xp  |
| </> NMF learns topics of documents                     | 100 xp |
| </> Explore the LED digits dataset                     | 100 xp |
| </> NMF learns the parts of images                     | 100 xp |
| </> PCA doesn't learn parts                            | 100 xp |
| ▶ Building recommender systems using NMF               | 50 xp  |
| </> Which articles are similar to 'Cristiano Ronaldo'? | 100 xp |
| </> Recommend musical artists part I                   | 100 xp |
| </> Recommend musical artists part II                  | 100 xp |
| ▶ Final thoughts                                       | 50 xp  |

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