

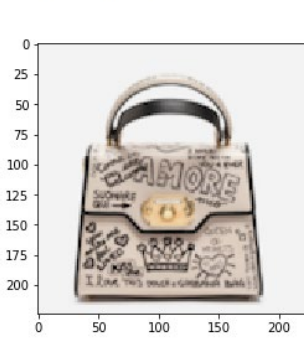
This week, unlike last week, unlike the CNN model that we designed in a notebook that we created ourselves, we experienced the model used in the recommendation system over the notebook that someone else worked on on the kaggle platform. [1] In this notebook, a pre-trained model called VGG16 was used based on transfer learning.

This model was trained using labeled images from the imagenet image database. This model, implemented from the Keras library, was applied to the dataset. After feature extraction, cosine similarity was calculated and similar products were listed. Basically, it is a distance measure that allows us to measure the similarity of vectors by calculating the cosine of the angle between two vectors. Cosine similarity measures orientation, not magnitude. The cosine of the angle between two vectors of the same orientation is close to 1. When the vectors are orthogonal to each other, the cosine value of the angle between two vectors is close to 0. For two diametrically opposite vectors, the cosine value is close to -1. [2]

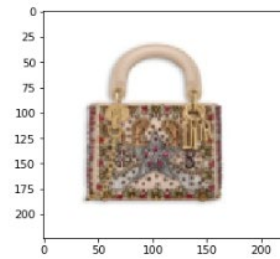
$$\text{cosine\_similarity}(A, B) = \frac{A \cdot B}{\|A\|_2 \times \|B\|_2}$$

Here is an example of similar products listed:

original product:



similarity score : 0.7953010



similarity score : 0.77419704



similarity score : 0.76686996



similarity score : 0.76224786



similarity score : 0.7616899

## References

- [1] Kaggle Source: <https://www.kaggle.com/code/rashaddism/product-recommendation-based-on-visual-similarity>
- [2] Web Source: <https://medium.com/machine-learning-t%C3%BCrkiye/cosine-similarity-python-uygulamas%C4%B1-926ff395c47e>

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