Now we are going to study some useful indicators that will allow us to analyze

the quality of a recommender system.

Recommender systems can be evaluated with three different kinds of quality metrics.

Error metrics, classification metrics and ranking metrics.

In this video, we will focus on the first category.

The purpose of error metrics is to estimate the difference between ratings

assigned by algorithms and ratings assigned by users.

Let's make an example.

We know that the user Paolo has rated the movie Star Wars 4 out of 5.

Anyway, the estimated value for

the rating that has been predicted by our algorithm is 3.7 out of 5.

There is a small difference between the two ratings.

The difference between the true value and

the estimated value is the error made by our algorithm.

As we can see, the absolute value of the error is 0.3.

But let's now discuss about some methods that could help us to evaluate

the goodness of our recommender system.

**Next Slide**

One simple technique is to compute the mean absolute error, MAE.

For each predicted rating, we compute the absolute value

of the difference between the actual rating and the estimated rating.

The overall average is the MAE.

The mean squared error consists in computing the average of the square

difference between each actual rating and the estimated rating.

Sometimes, for normalization, the root of the result is considered.

This technique is now popular for two reasons.

First of all, it was used for the Netflix competition.

The second reason is more technical.

Writing an algorithm for minimizing the mean absolute error is difficult while

minimizing the root mean squared error is relatively easier.