Google Cloud

Recommendation Systems on Google Cloud

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Hello, my name is Lak, and I led the team put together this course and this specialization.

Agenda

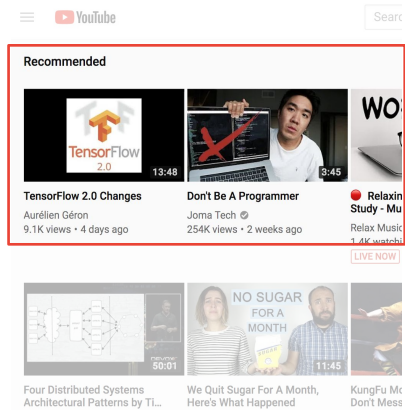We started out this course by explaining what recommendation systems are.

We said that
When you watch a video on YouTube and you see a list of suggested videos to watch next, that list is being built by a recommendation machine learning model.

Agenda

You can't just build a recommendation engine, an ML model, and call it a day.
You also need to build the entire, end-to-end system.

Agenda

We looked at how to build a content-based recommendation system, where the system recommends items to users based on metadata that is known about the items.

Agenda

We then learned abou how to implement collaborative filtering where you don't have any metadata about the products or users.
Instead, you learn about item similarity and user similarity from the ratings data itself.

The factorization splits this matrix into row factors and column factors that are essentially user and item embeddings

| | | 0.9 | -1 | 1 | 1 | -0.9 |
| | | -0.2 | -0.8 | -1 | 0.9 | 1 |

X

1	0.1
-1	0
0.2	-1
0.1	1

Much smaller

Very large

A

$\approx U \times V^T$
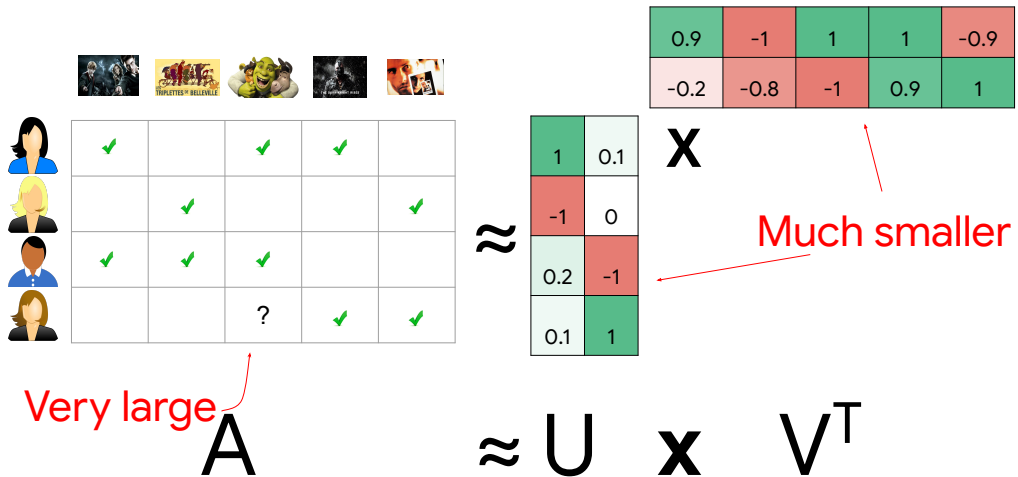
Because the interaction matrix is very large, we used the alternating least squares algorithm to factorize the interaction matrix into user factors and item factors.
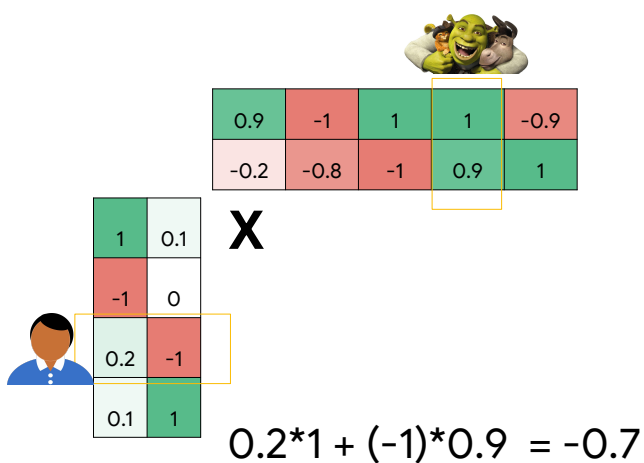
Then, if we need to find whether a user will like a particular movie, it is as simple as taking the row corresponding to the user and the column corresponding to the movie and multiplying them to get the predicted rating.

To recommend movies to users, we can recommend the movies that we predict they will rate the highest.

We did this in TensorFlow.

Agenda

Then, we looked at how to build a hybrid recommendation system.

YouTube video recommendations
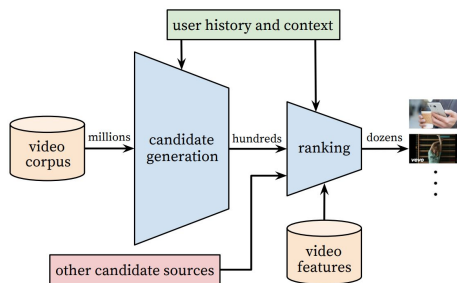
The hybrid model uses all the data available and connects all of these models together into an ML pipeline.
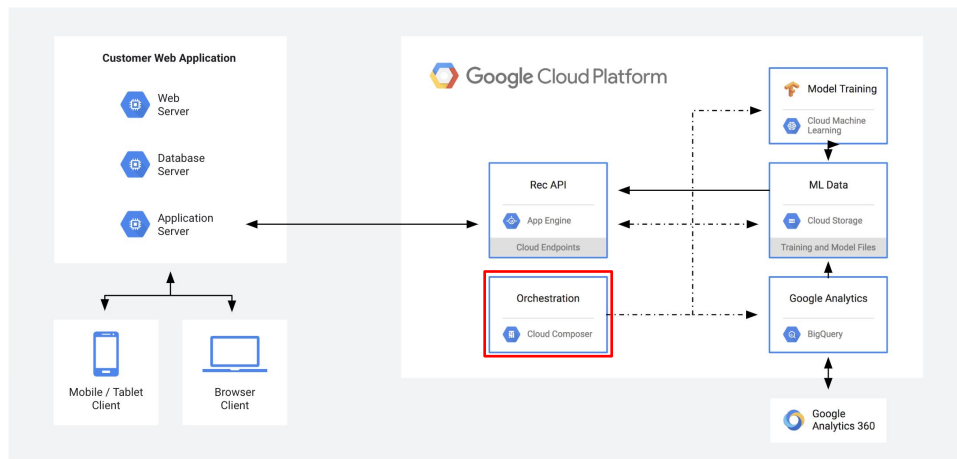
Agenda

Finally, we learned how to productionize and automate the ML pipeline in order to build and continuously retrain an end-to-end recommendation system.

We were able to orchestrate the continuous retraining of the recommendation system as new ratings data comes in from users.
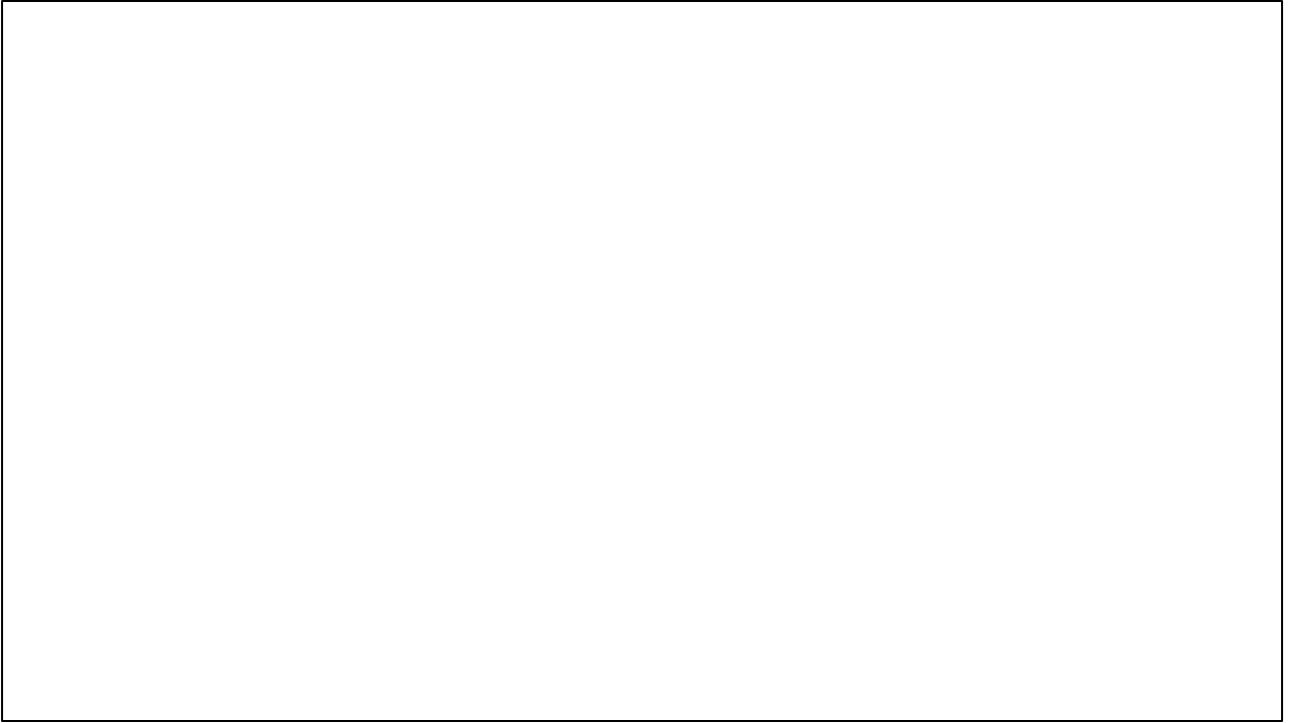
And with this, we come to the end of this course on recommendation systems.
Thank you for accompanying us on this journey!