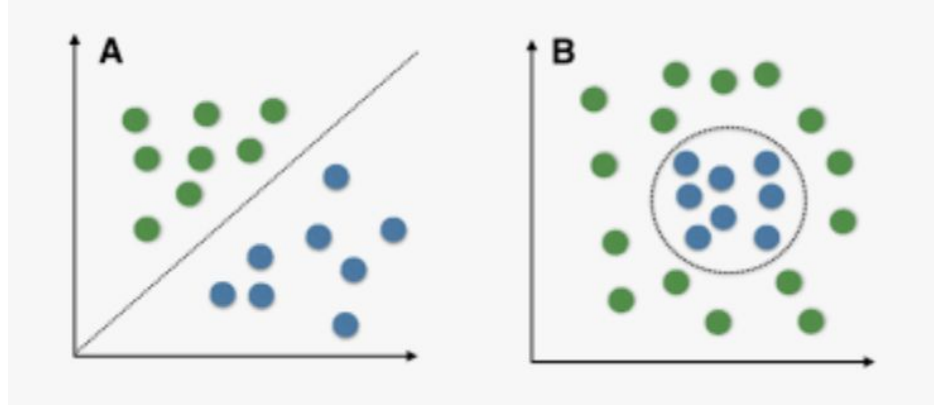


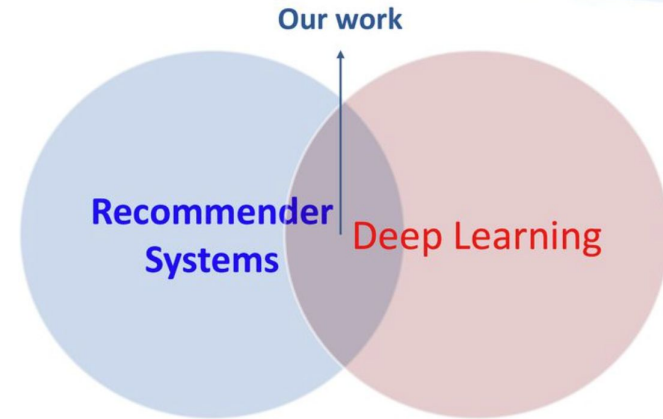
Neural Collaborative Filtering (NCF)

Why NCF

- Leverage the flexibility and non-linearity of Neural networks
- Enhance the model expressiveness



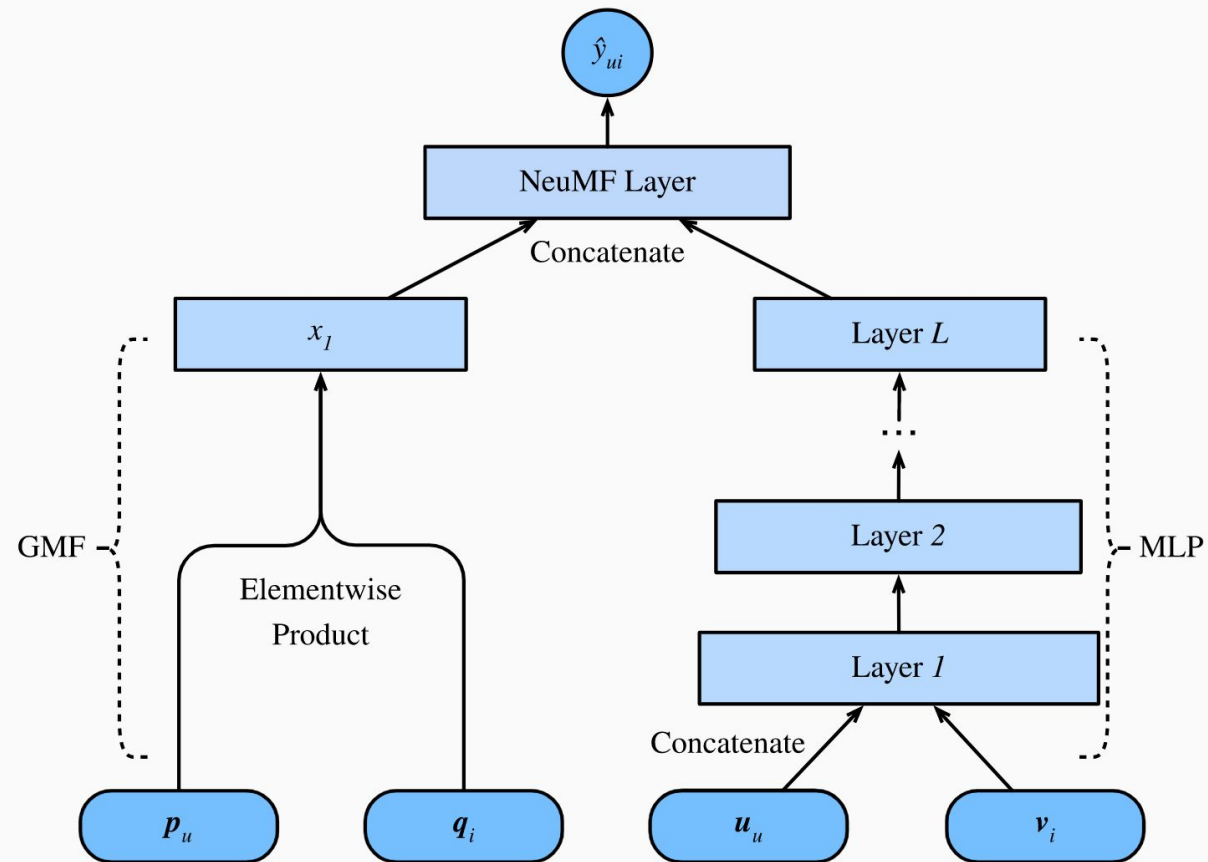
Learning the interaction function from the data, rather than the simple, fixed inner product



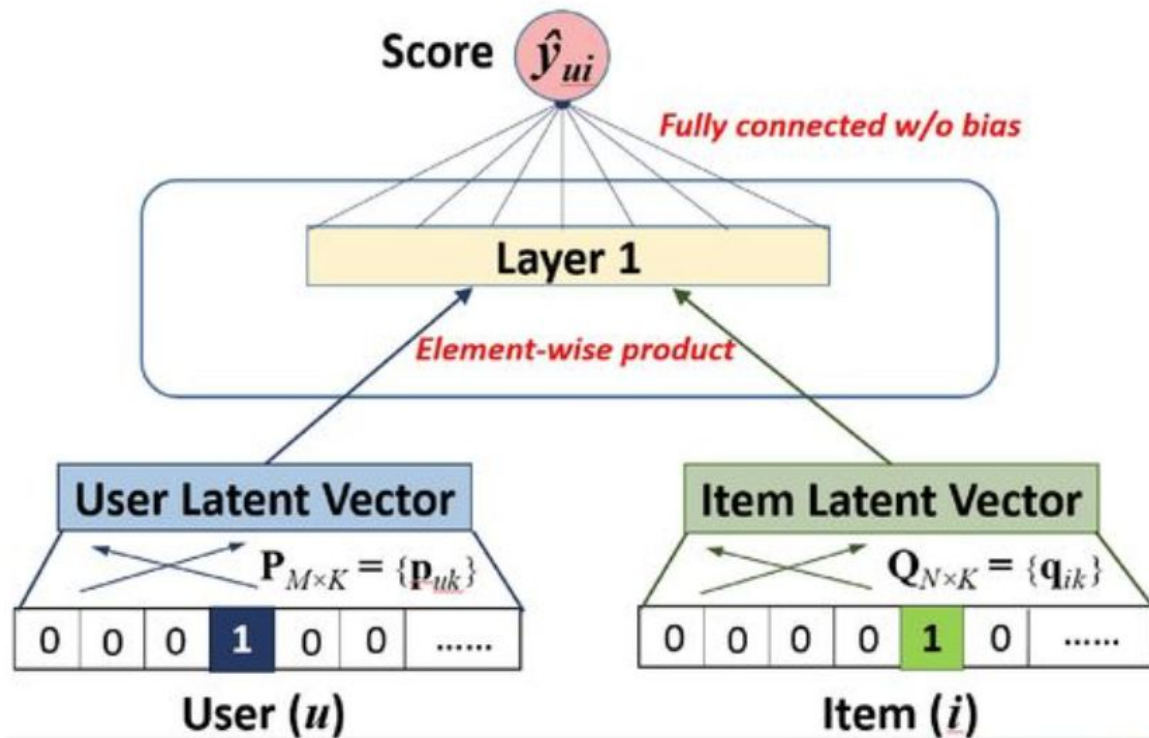
NCF Structure

- It is composed of two sub networks
- Generalized Matrix Factorization (GMF)
- Multi Layer Perceptron (MLP)
- The output of the two networks are concatenated for the final prediction scores

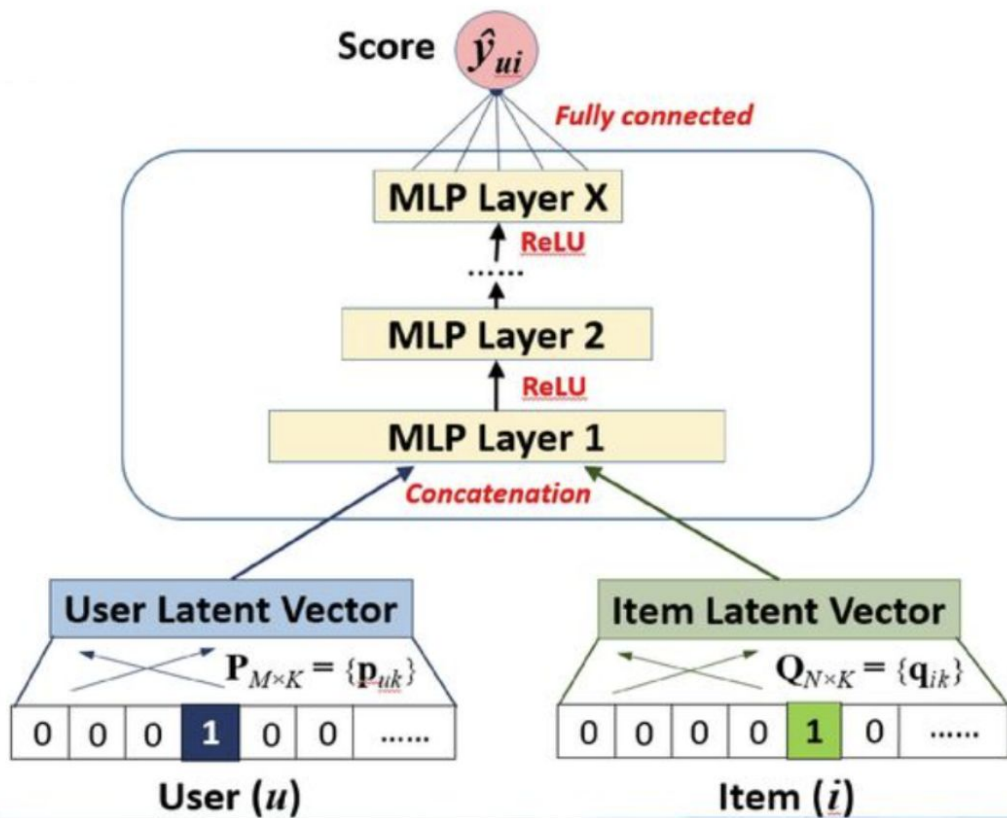
NCF Structure

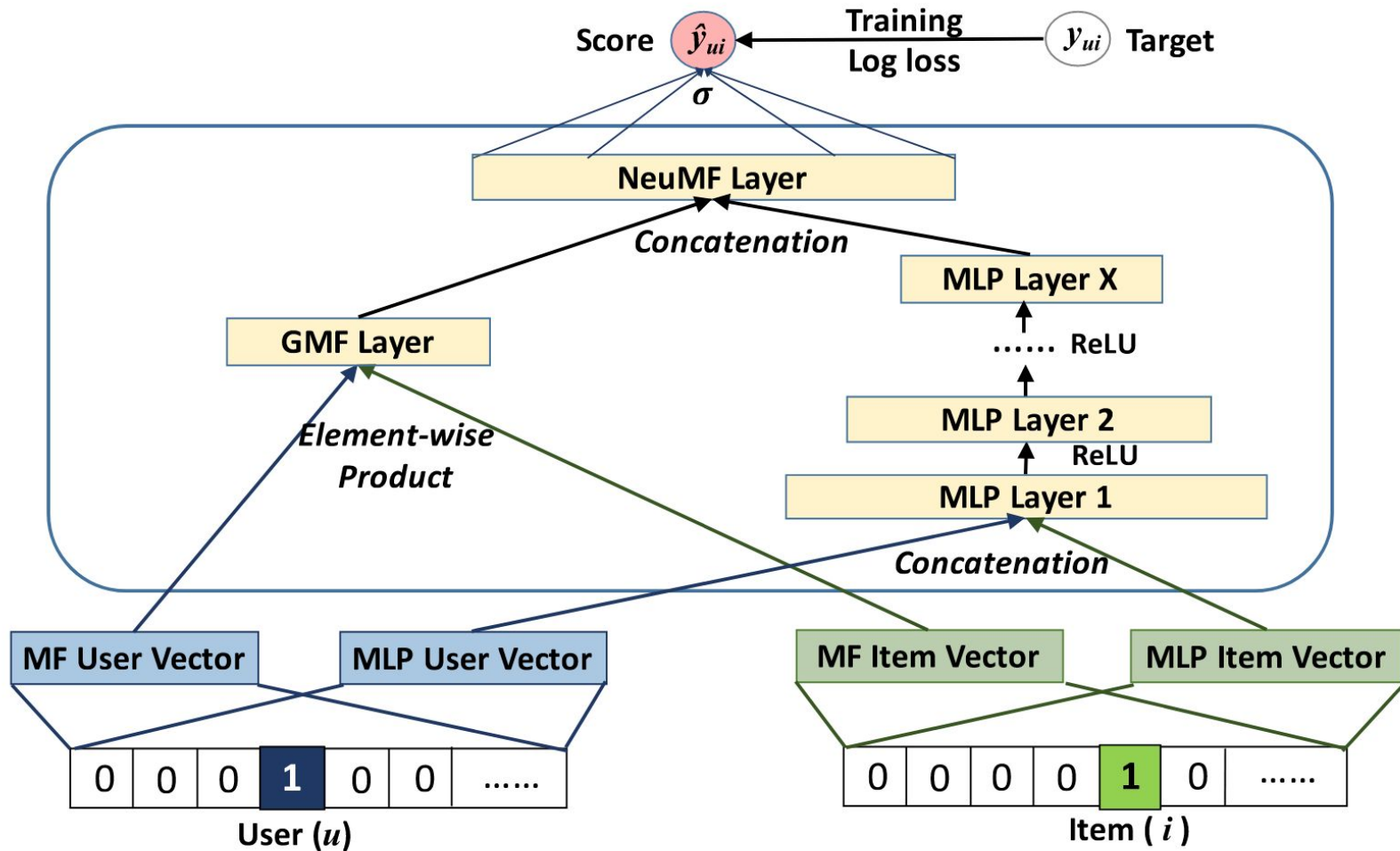


Generalized Matrix Factorization (GMF)

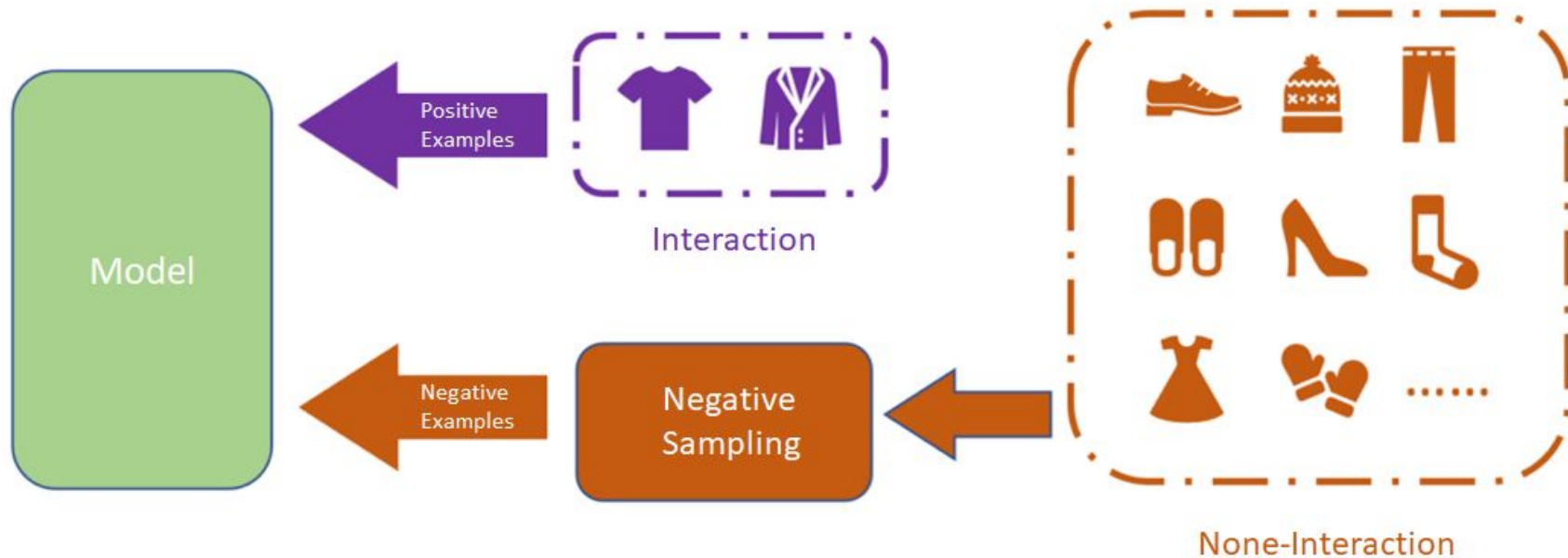


Multi-Layer Perceptron (MLP)

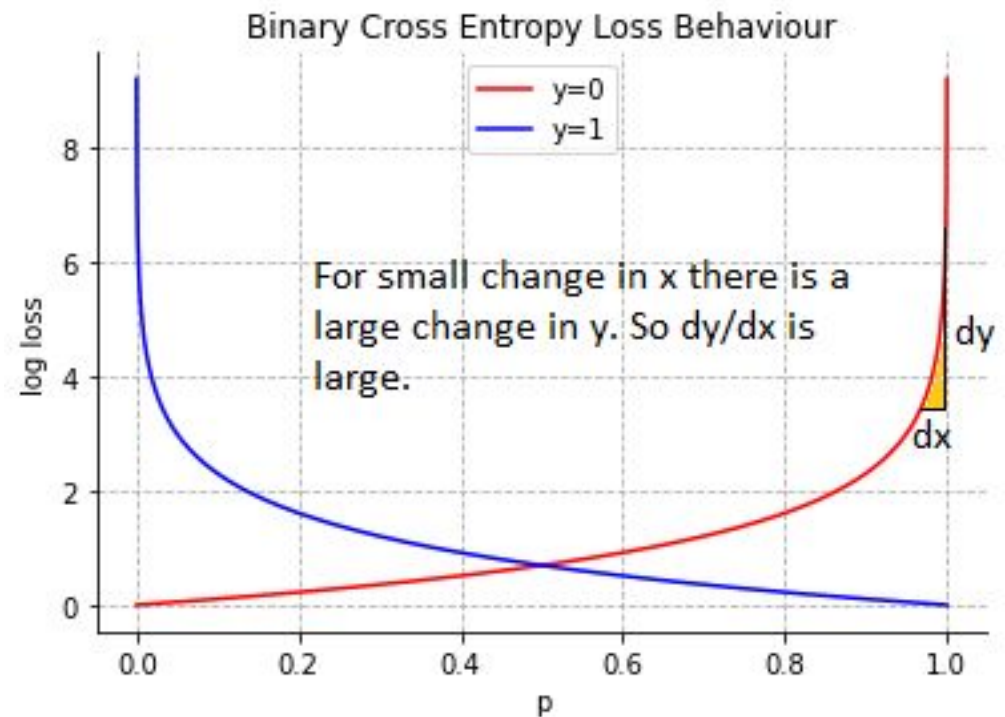




Negative Sampling



Binary Cross Entropy Loss



Learning NCF Models

- Regression loss for explicit feedback
- Classification (Binary cross entropy) loss for implicit feedback
- Optimization is done using Stochastic Gradient Descent

Summary

- This method is a guideline for developing deep learning systems for recommenders
- More expressive than Matrix Factorization
- Considers additional user and item information apart from interactions for modelling