كليـــــة العلـــــوم
والتقنيات - مراكش
FACULTE DES SCIENCES
ET TECHNIQUES - MARRAKECH

Master IAII
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1 Decembre 2023

Practice: Deep neural network vs MF with Keras

Objective:

The aim of this practical practice is to guide through the process of implementing and comparing two distinct recommender systems. The focus will be on Matrix Factorization (MF) using Keras as a foundational collaborative filtering method and a more advanced Deep Neural Network (DNN) based approach. By the end of this practical, you should have a solid understanding of how to build, train, and assess the performance of recommender systems using classical and deep learning techniques.

Tasks:

1. Dataset Loading and Preprocessing:

- ☐ Load the MovieLens dataset and inspect its structure.
- ☐ Preprocess the data, ensuring it is suitable for training and evaluation.
- ☐ Split the dataset into training and testing sets.

2. Matrix Factorization (MF) with Keras:

- ☐ Implement a Matrix Factorization model using Keras.
- ☐ Train the MF model on the training set.
- ☐ Evaluate the model's performance on the test set.
- ☐ Visualize and analyze the results.

3. Deep Neural Network (DNN) Recommender:

- ☐ Design a Deep Neural Network architecture for recommendation.
- ☐ Experiment with hyperparameters such as the number of layers, hidden units, and activation functions.
- ☐ Train the DNN model on the training set.
- ☐ Evaluate the DNN model on the test set.
- ☐ Visualize and analyze the results.

4. Model Comparison:

- ☐ Compare the performance metrics (e.g., Mean Squared Error) of the MF and DNN models on the test set.
- ☐ Identify and discuss any observed improvements or differences.
- ☐ Explore hyperparameter tuning for the DNN model.
- ☐ Consider additional enhancements or modifications for further experimentation.

5. Final Report and Submission:

- ☐ Summarize the key findings and insights from the practical.
- ☐ Provide a clear comparison between Matrix Factorization and Deep Neural Network models.
- ☐ Share any recommendations or lessons learned.
- ☐ Submission: Submit the well-commented code and the report.
  Email your report to [sara.qassimi@uca.ac.ma] before midnight on . Ensure the subject of your email is "Practice-DNNvsMFwithKeras - [Your Name]."
  Late submissions will not be accepted.