Overall requirements:

1) Please form a group of 1-4 students and choose one of the following questions. Each group only needs to submit one experimental report. All members within the group have the same score.

2) Each group will package the experimental code, output files, and experimental report into group number–大作业-deep learning.rar, and send it to owen\_zsz@mail.ustc.edu.cn. The deadline for report submission is 0:00 on December 16th.

3) The experimental scoring criteria are based on the competition score and the quality of report writing. The report should include screenshots of the evaluation results of all models on the competition platform.

Competition Question 1: Zero Foundation Beginner Recommendation System - News Recommendation

Competition link: https://tianchi.aliyun.com/competition/entrance/531842/information

Competition summary: Predicting users' future clicks on news articles based on their known behavior.

Experimental requirements:

1) Reproduce at least two common deep models of recommendation systems to complete the competition. Students need to explain in the report the principles used in the reproduced model. Here are some examples of common models (not limited to these categories):

① Collaborative filtering, such as LightGCN（ https://github.com/kuandeng/LightGCN ）SGL（ https://github.com/wujcan/SGL-Torch ）etc.

② Sequence recommendation, such as GRU4Rec

（ https://github.com/RUCAIBox/RecBole/blob/master/recbole/model/sequential\_recommender/gru4rec.py ）SASRec

（ https://github.com/RUCAIBox/RecBole/blob/master/recbole/model/sequential\_recommender/sasrec.py ）etc.

③ Based on knowledge graph, such as KGCN（ https://github.com/zzaebok/KGCN-pytorch ）etc.

2) Design a model based on deep learning and calculate the results. Please explain the design concept in the experimental report.

Question 2: Time series prediction learning competition

Competition link: https://tianchi.aliyun.com/competition/entrance/532224/information

Competition summary: Time series prediction task in financial scenarios.

Experimental requirements:

1) Reproduce at least two classic time series prediction models based on deep learning to complete the competition, such as time series prediction based on CNN, LSTM, Transformer and other models.

2) Design a model based on deep learning and calculate the results. Please explain the design concept in the experimental report.

Question 3: Medical Search Query Relevance Determination

Competition link: https://tianchi.aliyun.com/competition/entrance/532001/information

Competition summary: Evaluate the relevance and matching between two queries and the topic.

Experimental requirements:

1) Read and run at least two baseline codes provided in the "Learning Materials" section of the competition page, and explain the principles of the baselines used in the experimental report.

2) Simply change the model in the baseline to any other language model (such as RoBERTa, ALBERT, GPT2, etc.) and compare its performance.

3) Design a model based on deep learning and calculate the results. Please explain the design concept in the experimental report.