COMP 4332 / RMBI 4310
Big Data Mining (Spring 2022)

Project 3 Rating Prediction

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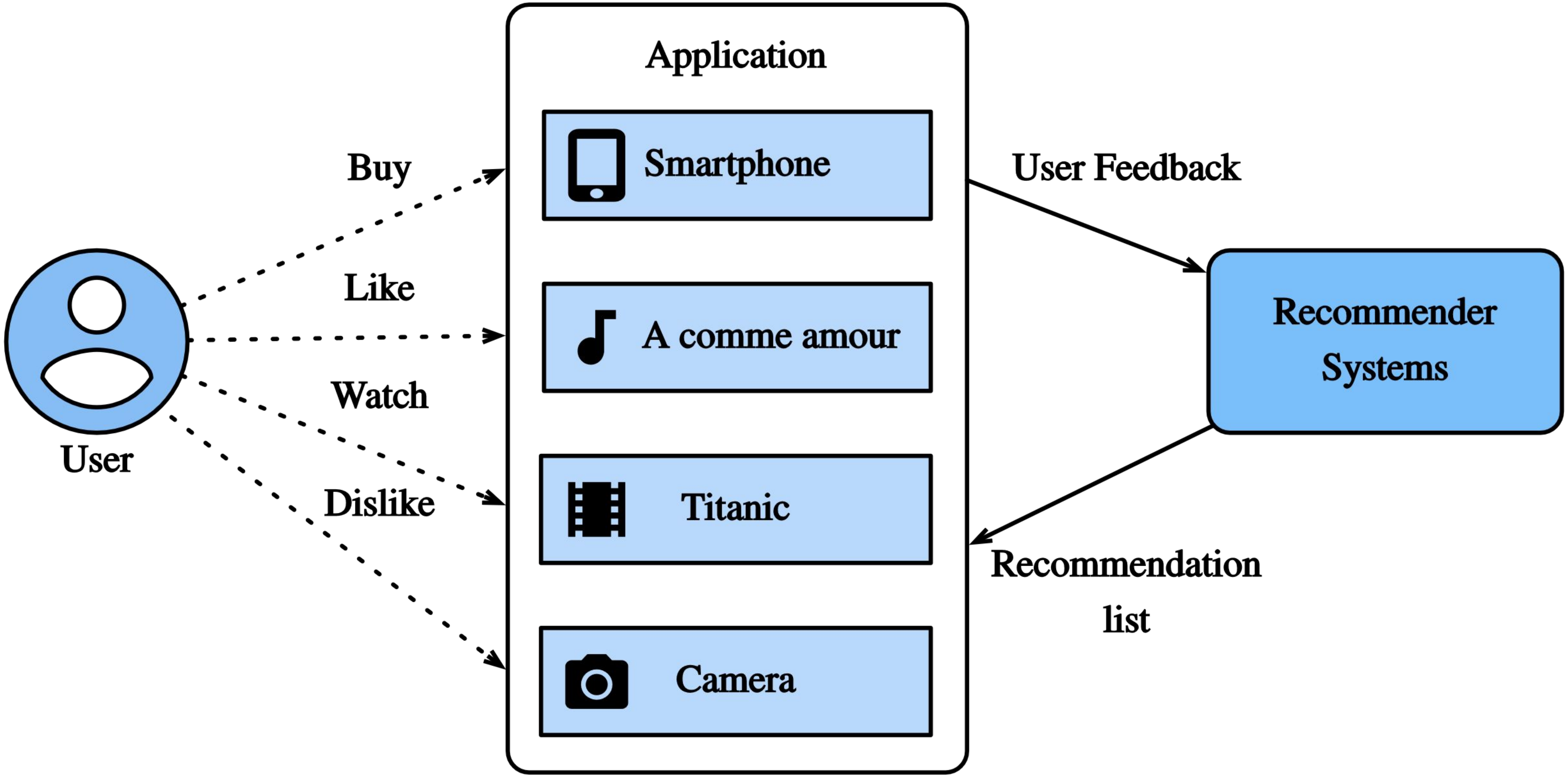
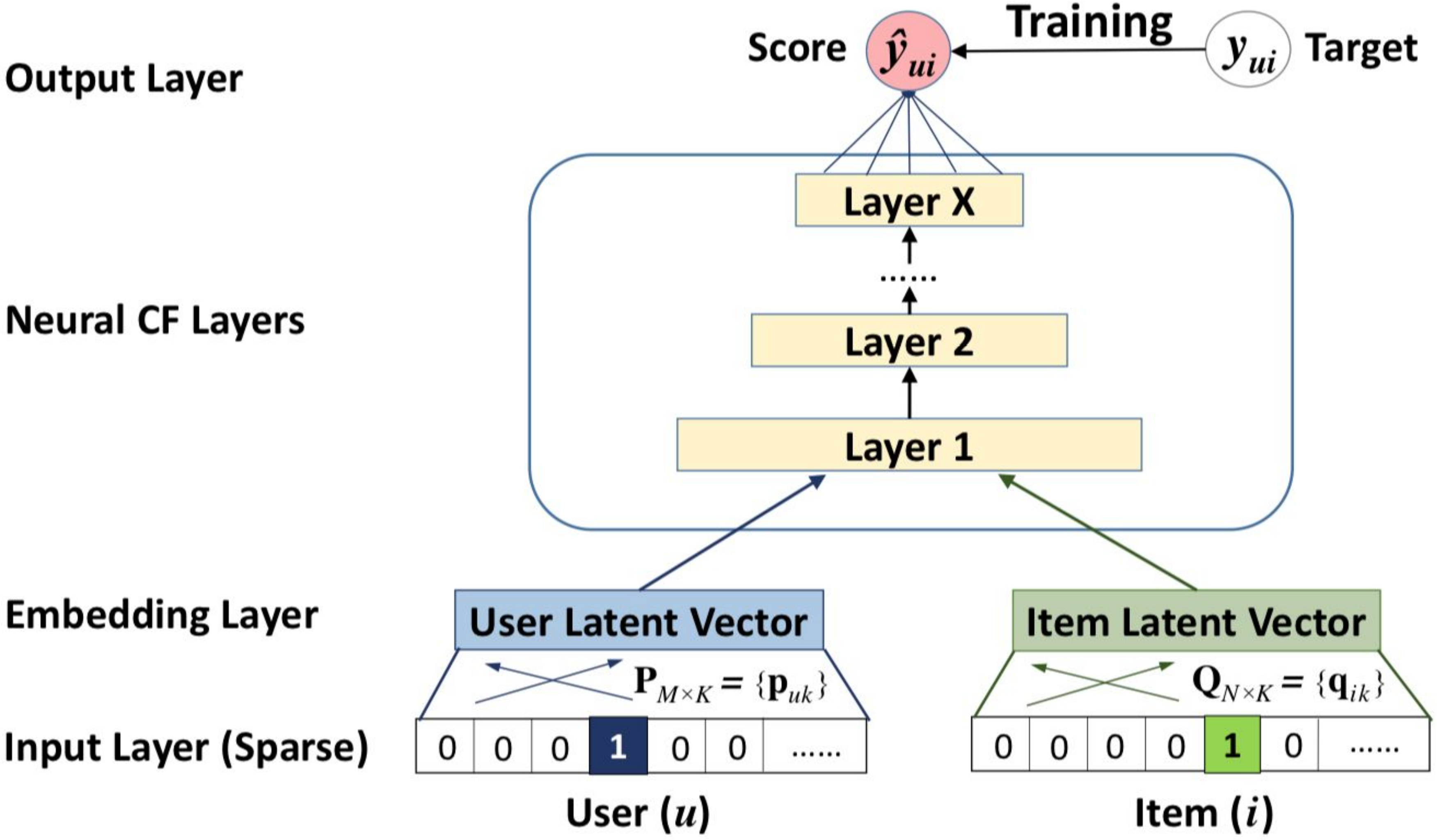
Recommendation Systems



In Previous Tutorial

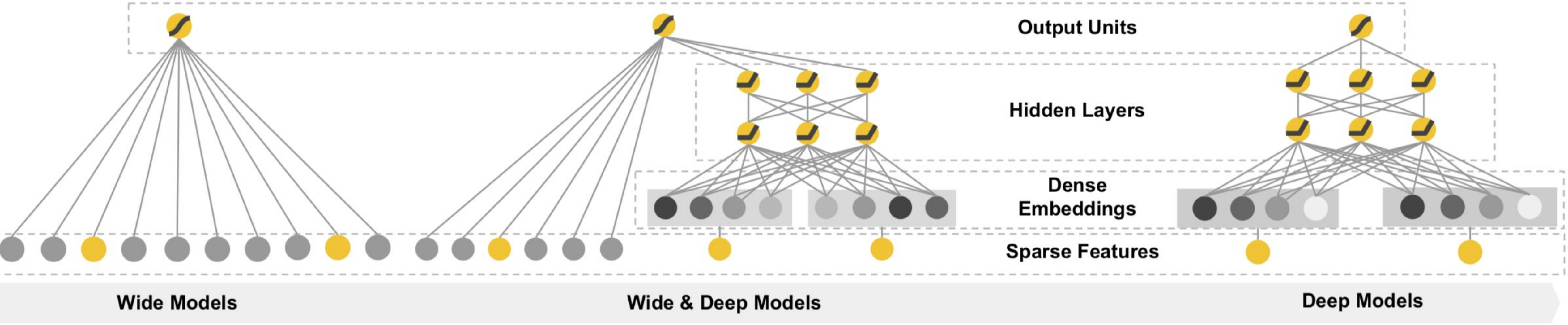
Neural CF



Xiangnan He, Lizi Liao, Hanwang Zhang, Liqiang Nie, Xia Hu and Tat-Seng Chua (2017). Neural Collaborative Filtering. In Proceedings of WWW '17, Perth, Australia, April 03-07, 2017.

In Previous Tutorial

Wide & Deep Learning



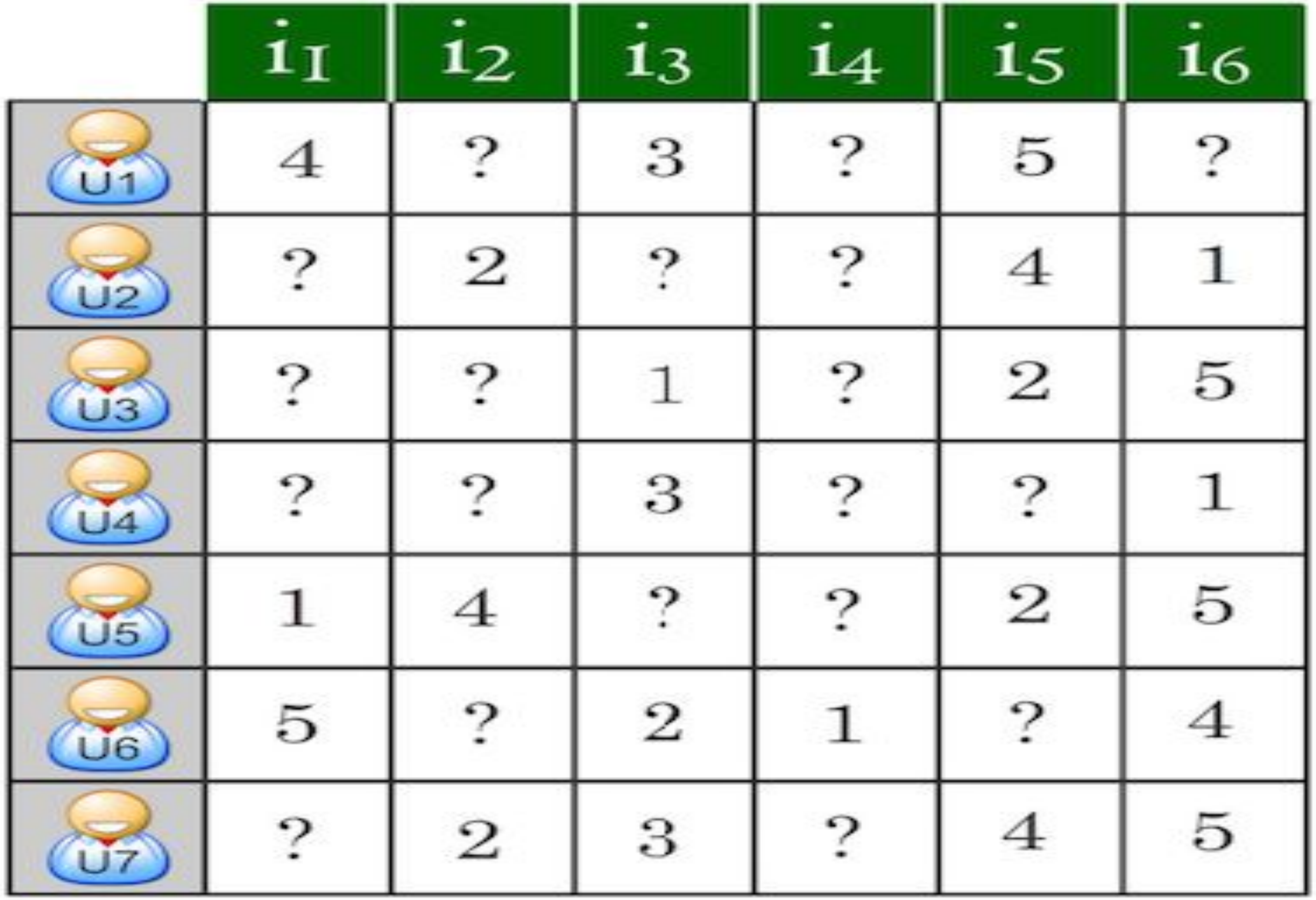
Memorization

Generalization

Heng-Tze Cheng,Levent Koc,Jeremiah Harmsen,Tal Shaked,Tushar Chandra, Hrishi Aradhye, Glen Anderson, Greg Corrado, Wei Chai, Mustafa Ispir, et al. 2016. Wide & deep learning for recommender systems. In Proceedings of the 1st Workshop on Deep Learning for Recommender Systems. ACM, 7–10.

Rating Prediction

- Predict users’ ratings on items given some known ratings. The prediction would be evaluated by Root Mean Squared Error (RMSE)

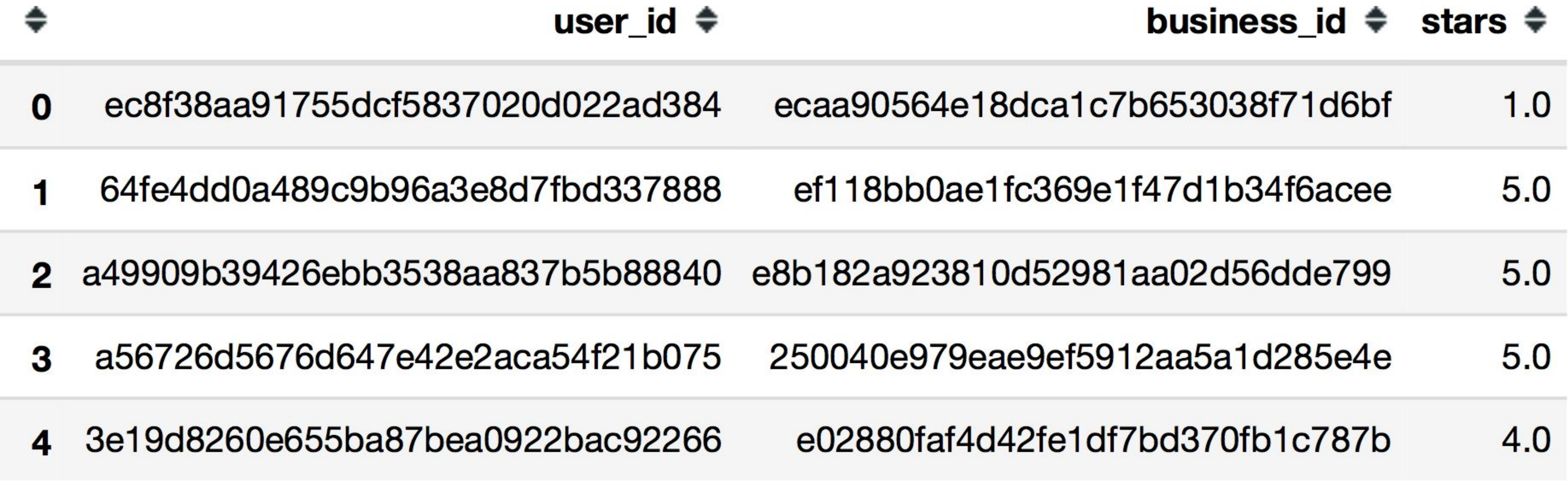


	i_1	i_2	i_3	i_4	i_5	i_6
U1	4	?	3	?	5	?
U2	?	2	?	?	4	1
U3	?	?	1	?	2	5
U4	?	?	3	?	?	1
U5	1	4	?	?	2	5
U6	5	?	2	1	?	4
U7	?	2	3	?	4	5

Dataset

- User ratings
- Extra user information
- Extra business information

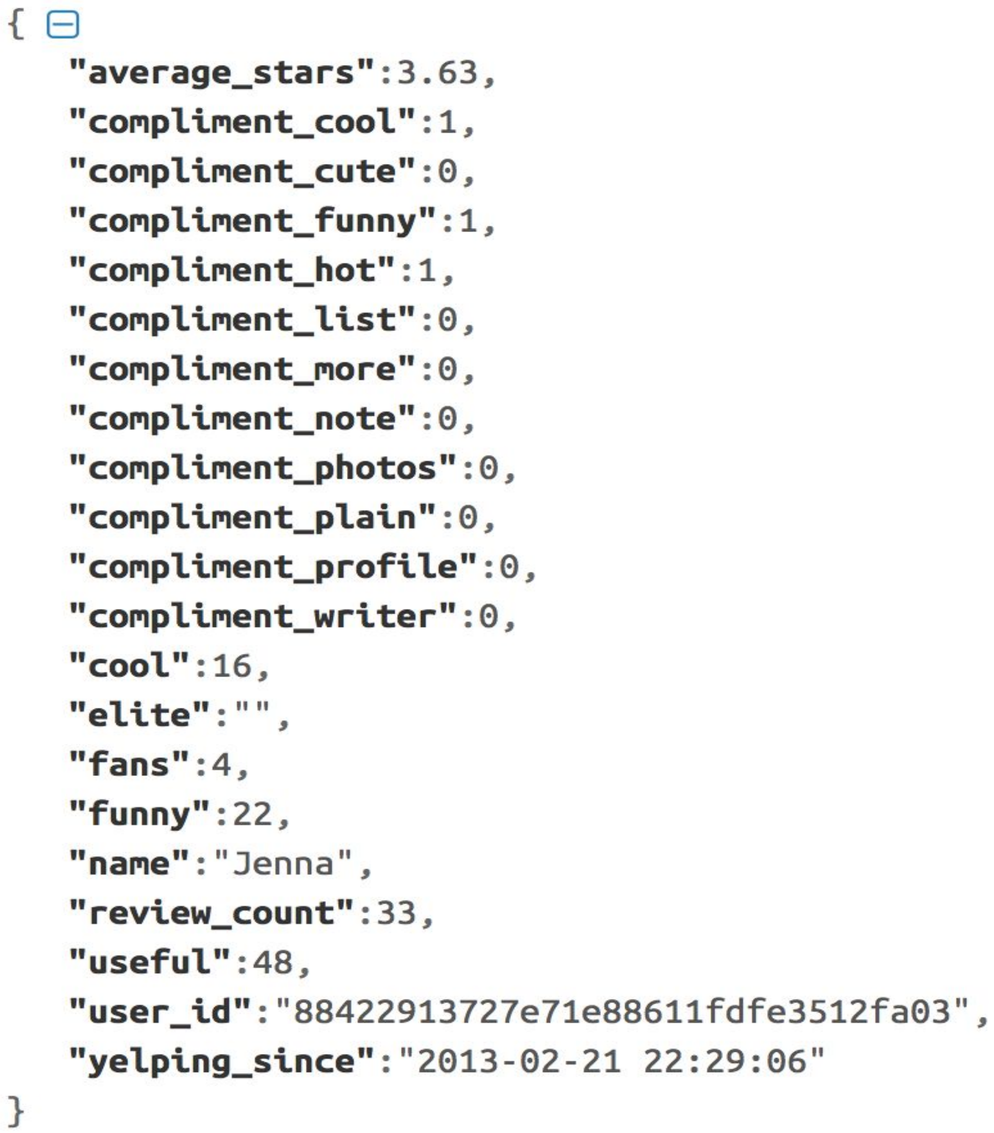
User ratings:



	user_id	business_id	stars
0	ec8f38aa91755dcf5837020d022ad384	ecaa90564e18dca1c7b653038f71d6bf	1.0
1	64fe4dd0a489c9b96a3e8d7fbd337888	ef118bb0ae1fc369e1f47d1b34f6acee	5.0
2	a49909b39426ebb3538aa837b5b88840	e8b182a923810d52981aa02d56dde799	5.0
3	a56726d5676d647e42e2aca54f21b075	250040e979eae9ef5912aa5a1d285e4e	5.0
4	3e19d8260e655ba87bea0922bac92266	e02880faf4d42fe1df7bd370fb1c787b	4.0

Extra user information

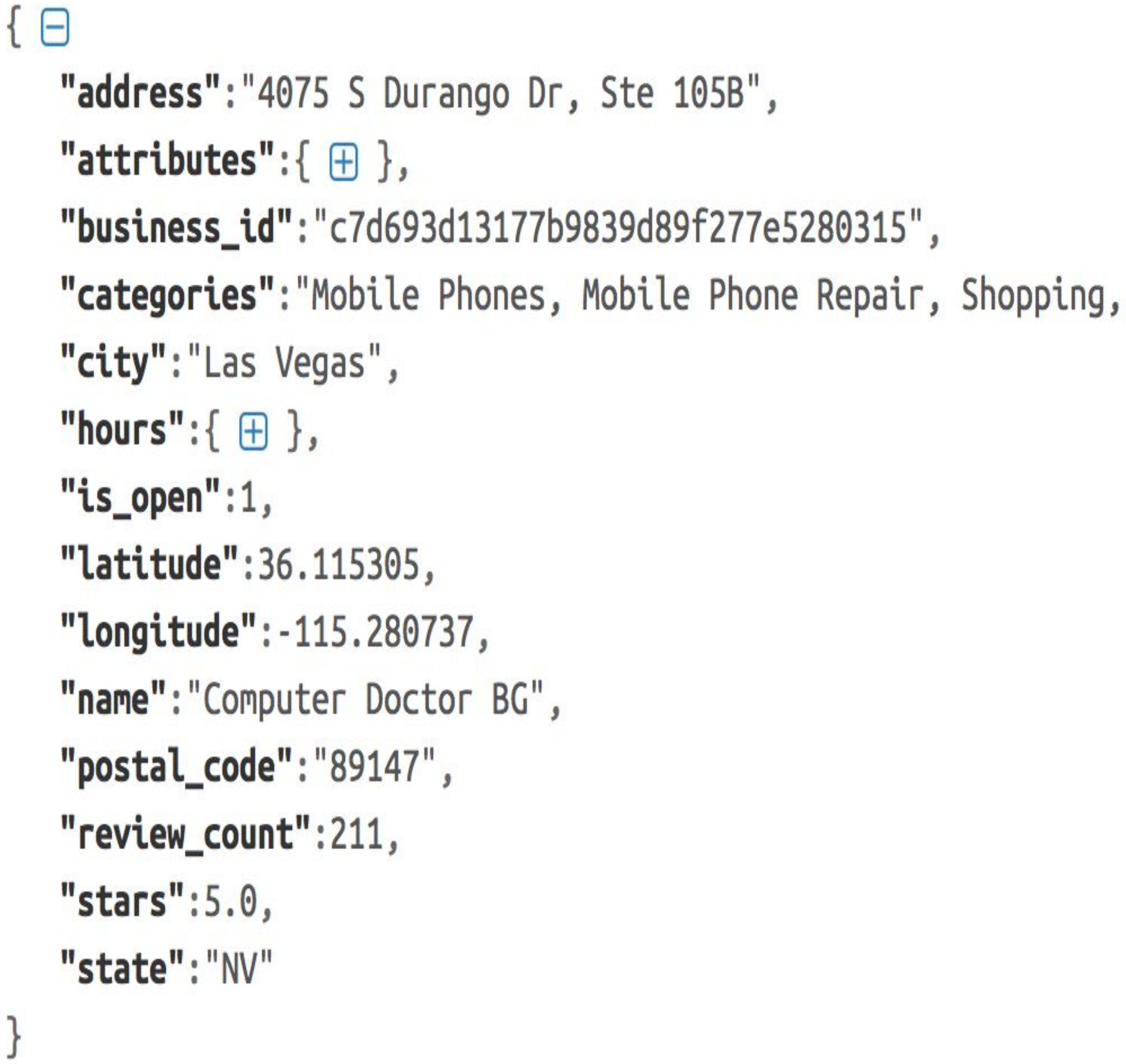
Techniques for using this information through Wide and Deep Learning model will be introduced in tutorial 8



```
{ ⊟
    "average_stars":3.63,
    "compliment_cool":1,
    "compliment_cute":0,
    "compliment_funny":1,
    "compliment_hot":1,
    "compliment_list":0,
    "compliment_more":0,
    "compliment_note":0,
    "compliment_photos":0,
    "compliment_plain":0,
    "compliment_profile":0,
    "compliment_writer":0,
    "cool":16,
    "elite":"",
    "fans":4,
    "funny":22,
    "name":"Jenna",
    "review_count":33,
    "useful":48,
    "user_id":"88422913727e71e88611fdfe3512fa03",
    "yelping_since":"2013-02-21 22:29:06"
}
```

Extra business information

Techniques for using this information through Wide and Deep Learning model will be introduced in tutorial 8



```
{ ⊟
    "address":"4075 S Durango Dr, Ste 105B",
    "attributes":{ ⊞ },
    "business_id":"c7d693d13177b9839d89f277e5280315",
    "categories":"Mobile Phones, Mobile Phone Repair, Shopping,
    "city":"Las Vegas",
    "hours":{ ⊞ },
    "is_open":1,
    "latitude":36.115305,
    "longitude":-115.280737,
    "name":"Computer Doctor BG",
    "postal_code":"89147",
    "review_count":211,
    "stars":5.0,
    "state":"NV"
}
```

We provide:

- Rating data (rating scale is 1.0-5.0) :
  - ‘train.csv’ : 60080 ratings
  - ‘valid.csv’ : 7510 ratings
  - ‘test.csv’ : 7510 ratings (entries of ‘stars’ column in ‘test.csv’ are all set to 0.0)
- User information :
  - ‘user.csv’: 2980 users
- Business information
  - ‘business.csv’: 5964 businesses
- Code for evaluating predictions: ‘evaluate.py’

Submission

- Predictions on **test data** (please make sure you can successfully evaluate your validation predictions on the validation data with the help of evaluate.py)
- Report (1~2 pages)
- Code (Frameworks and even programming languages are not restricted.)
- DDL: 11:59 pm, May 23, 2022
- Submission: Each **team leader** is required to submit the groupNo.zip file that contains pre.csv, the report, and your team's code on canvas.
- we will check your report with your code and the RMSE.

Grading Rule

Grade	Model (80%)	Report (20%)	Baseline (RMSE on test set)
60%		submission	1.20
80%	an easy baseline that most students can outperform	detailed explanation	1.15
90%	a competitive baseline that about half students can surpass	detailed explanation and analysis	1.12
100%	a very competitive baseline	excellent visualization and analysis	1.09

Thank You