

Master Thesis
Recommender Systems Comparison

Vasileios Symeonidis

27-05-2017

Contents

I	Master Thesis	i
1	Intro	i
2	Collaborative filtering	i
2.1	Content based	i
2.2	Latent Factors	i
3	Our Experiment	i
3.1	Infrastructure	i
3.1.1	Apache Spark	i
3.2	Dataset	i
3.3	Metrics	i
3.3.1	Mean Absolute Error	i
3.3.2	Execution Time	i
4	Results	ii
5	Conclusion	ii
6	references	ii
II	Appendices	iii
A	Code used	iii
A.1	User Based Collaborative Filtering	iii
A.2	Product Based Collaborative Filtering	iii
A.3	Latent Factors	iii
B	infra code	iii
C	Metrics	iii
C.1	What is the mean absolute error	iii
C.2	Time	iii
D	List of Tables	iv

Part I

Master Thesis

1 Intro

This is the intro suction for this master thesis.sdfsdf sdfsdfdddsdfsdfsdfsffs-
fsffsfssfsfdffdf11 sdfsdfs

wwerwerfdfsdddddddddddddddddddsdfsdfsfsd fs dfs fsffffffffffffffffffffffffffff
fsdf sdfdf

2 Collaborative filtering

2.1 Content based

2.2 Latent Factors

test sadsad
sad
asd
ds

$$w = (\lambda I + X^T X)^{-1} X^T Y$$

Figure 1: **Equation**

3 Our Experiment

3.1 Infrastructure

3.1.1 Apache Spark

3.2 Dataset

3.3 Metrics

3.3.1 Mean Absolute Error

3.3.2 Execution Time

[1] [2] [3]

4 Results

Table 1: **Content Based Algorithm Results**

Training Dataset	Testing Dataset	Mean Absolute Error	Execution time (ms)
ml-100k/u1.base	ml-100k/u1.test	1.6467431428213226	30514
ml-100k/u2.base	ml-100k/u2.test	1.6055222166704628	27714
ml-100k/u3.base	ml-100k/u3.test	1.608925907479106	27164
ml-100k/u4.base	ml-100k/u4.test	1.6259192043203685	26687
ml-100k/u5.base	ml-100k/u5.test	1.6284658627202895	27124
ml-100k/ua.base	ml-100k/ua.test	1.6425364580036836	26640
ml-100k/ub.base	ml-100k/ub.test	1.6357196576385744	26861

Table 2: **Latent Factors Algorithm Results**

Training Dataset	Testing Dataset	Mean Absolute Error	Execution time (ms)
ml-100k/u1.base	ml-100k/u1.test	1.1818684937209607	10195
ml-100k/u2.base	ml-100k/u2.test	1.1800652808093945	6517
ml-100k/u3.base	ml-100k/u3.test	1.1783366748334452	5377
ml-100k/u4.base	ml-100k/u4.test	1.1730543877181654	5433
ml-100k/u5.base	ml-100k/u5.test	1.1686585291940668	5217
ml-100k/ua.base	ml-100k/ua.test	1.2008035300836668	5214
ml-100k/ub.base	ml-100k/ub.test	1.2134460078406009	5083

5 Conclusion

6 references

Part II

Appendices

A Code used

A.1 User Based Collaborative Filtering

A.2 Product Based Collaborative Filtering

A.3 Latent Factors

B infra code

C Metrics

C.1 What is the mean absolute error

C.2 Time

List of Figures

1	Equation	i
---	--------------------	---

D List of Tables

List of Tables

1	Content Based Algorithm Results	ii
2	Latent Factors Algorithm Results	ii

References

- [1] “Apache Spark lightning-fast cluster computing.” <https://spark.apache.org/>. Accessed: 2017-05-21.
- [2] P. Melville and V. Sindhvani, “Recommender systems,” *Encyclopedia of Machine Learning and Data Mining*, pp. 1056–1066, 2017.
- [3] “MovieLens grouplens.” <https://grouplens.org/datasets/movielens/>. Accessed: 2017-05-22.