

Master Thesis
Recommender Systems Comparison

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Contents

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
I	test	ii
A	Appendix relevant code	ii
A.1	Appendix A.a: User Based Collaborative Filtering 8	ii
A.2	Appendix A.b: Product Based Collaborative Filtering 8	ii
A.3	Appendix A.c: Latent Factors	ii
B	Title of Appendix A	ii
C	Title of Appendix B	ii
D	apendixB Metrics	iii
E	apendixC List of Figures	iii
F	apendixC List of Tables	iii

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

Figure 1: **Equation**

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

1 Intro

2 Collaborative filtering

2.1 Content based

2.2 Latent Factors

test

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]

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

4 Results

5 Conclusion

6 references

Part I

test

A Appendix relevant code

A.1 Appendix A.a: User Based Collaborative Filtering 8

A.2 Appendix A.b: Product Based Collaborative Filtering 8

A.3 Appendix A.c: Latent Factors

B

Title of Appendix A

Text of Appendix A is Here

C

Title of Appendix B

Text of Appendix B is Here

D apendixB Metrics

E apendixC List of Figures

List of Figures

1	Equation	i
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F apendixC List of Tables

List of Tables

1	Content Based Algorithm Results	i
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. Sindhwani, “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.