Topic Trend analysis with temporal topic modeling

Denim Trend Analysis

Jeewon Lee
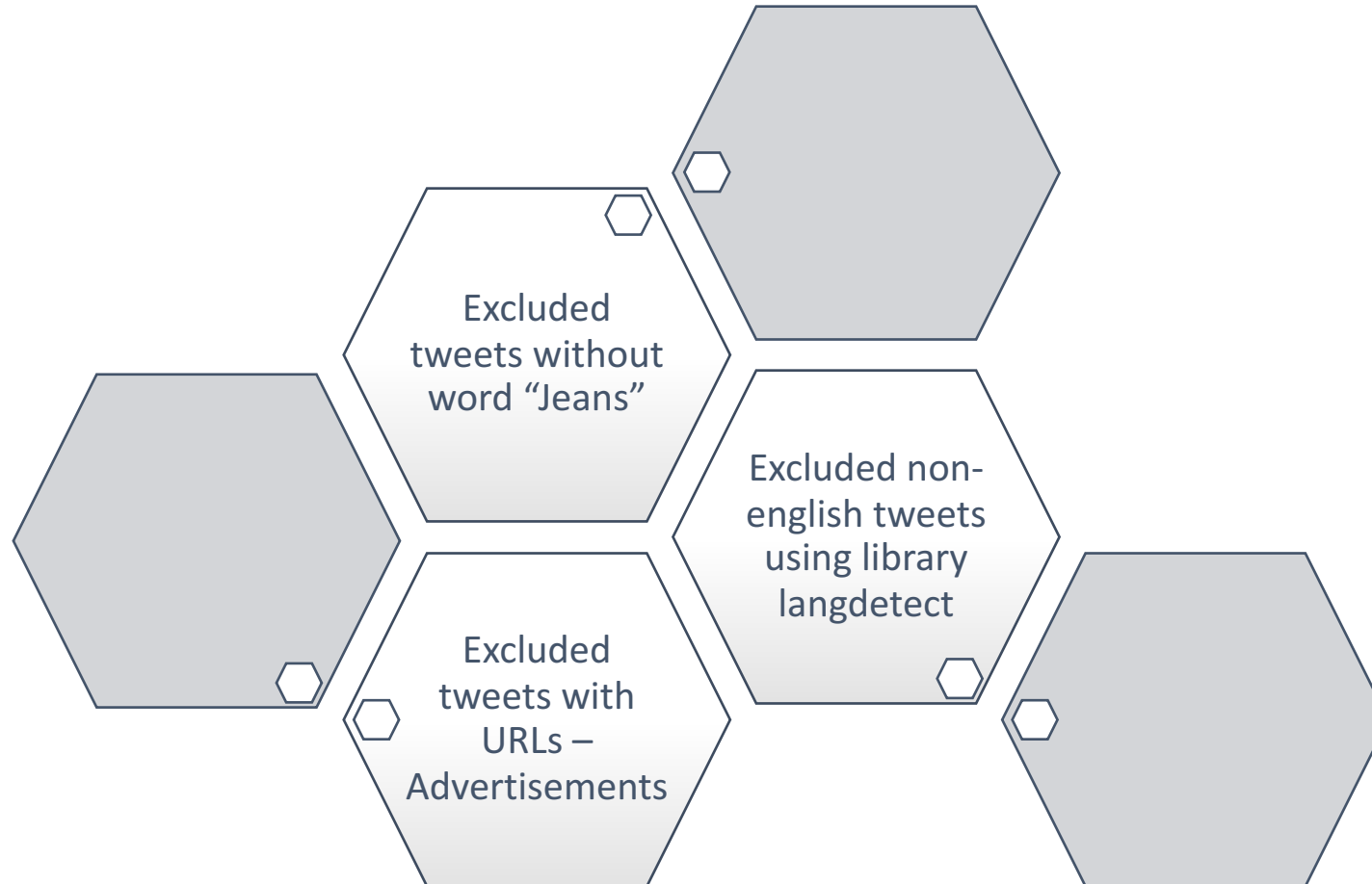
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https://github.com/jeewonlee/DenimTrendAnalysis

Data Source

- Twitter Data with word "Jeans" from 2012/12 to 2016/10
- 1000 per day, total 842,130 data points

Data Filtering

Excluded tweets without word "Jeans"

Excluded tweets with URLs – Advertisements

Excluded non-english tweets using library langdetect

Model Selection

NMF
Non-negative Matrix Factorization
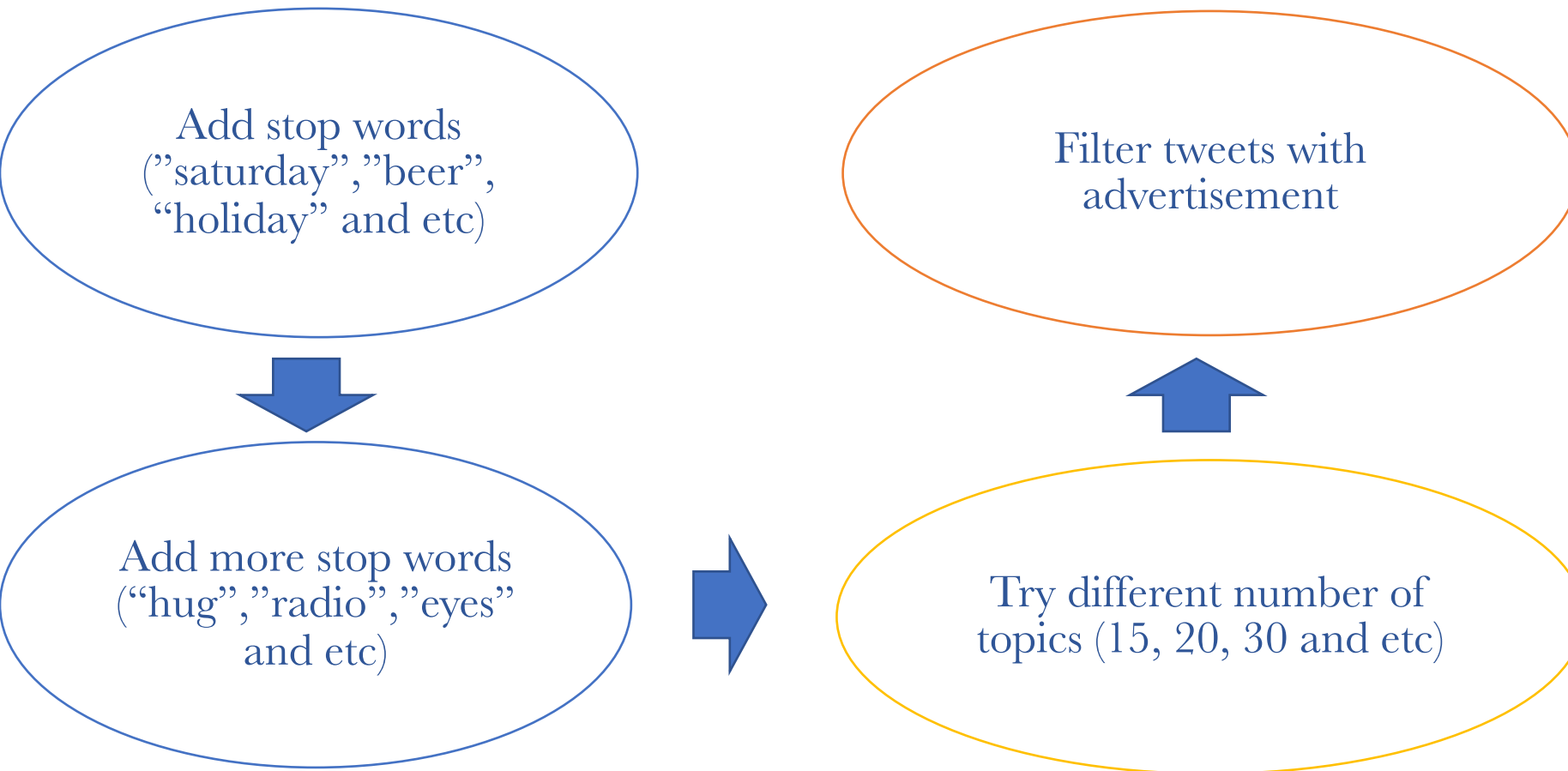
VS

LDA
Latent Dirichlet Allocation

Initial Model Output

- Topic #6: skinny, skinny jeans, jeans, black skinny, ripped skinny
- Topic #21: white, white jeans, need white, jeans, want
- Topic #7: room jeans, room, anymore, tell, tell anymore
- Topic #11: hate, hate jeans, jeans much, much, really hate
- Topic #22: get, get jeans, can get, jeans, jeans get
- Topic #26: love, love jeans, jeans, play love, play, jeans love, love way
- Topic #27: like, jeans like, like jeans, don like, feel like

Non-fashion Topics!

Data Cleaning

Add stop words
("saturday","beer",
"holiday" and etc)

Filter tweets with
advertisement

Add more stop words
("hug","radio","eyes"
and etc)

Try different number of
topics (15, 20, 30 and etc)

Who do you think wrote these tweets?

So you can keep me inside the pocket of your ripped jean.

She got the blue jeans painted on tight, what everybody wants on a Saturday night.

Everything is blue his pills his hands his jeans.

Who do you think wrote these tweets?

So you can keep me inside the pocket of your ripped jean.

She got the blue jeans painted on tight, what everybody wants on a Saturday night.
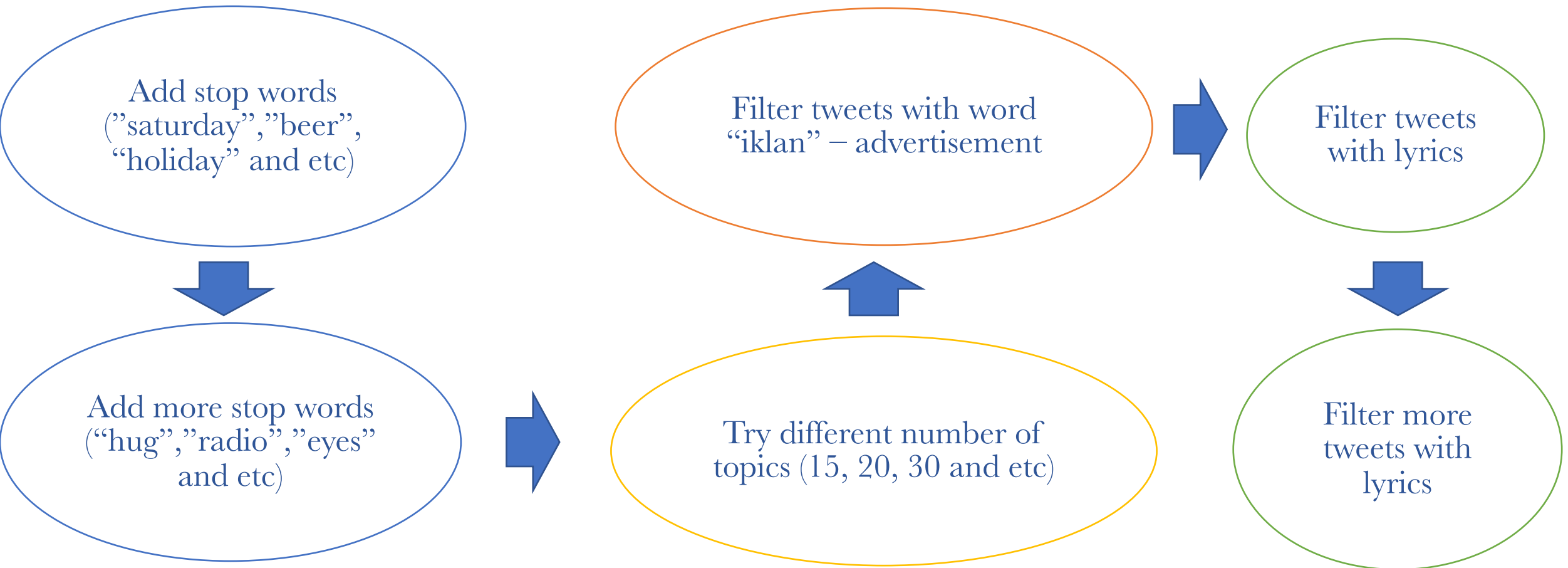
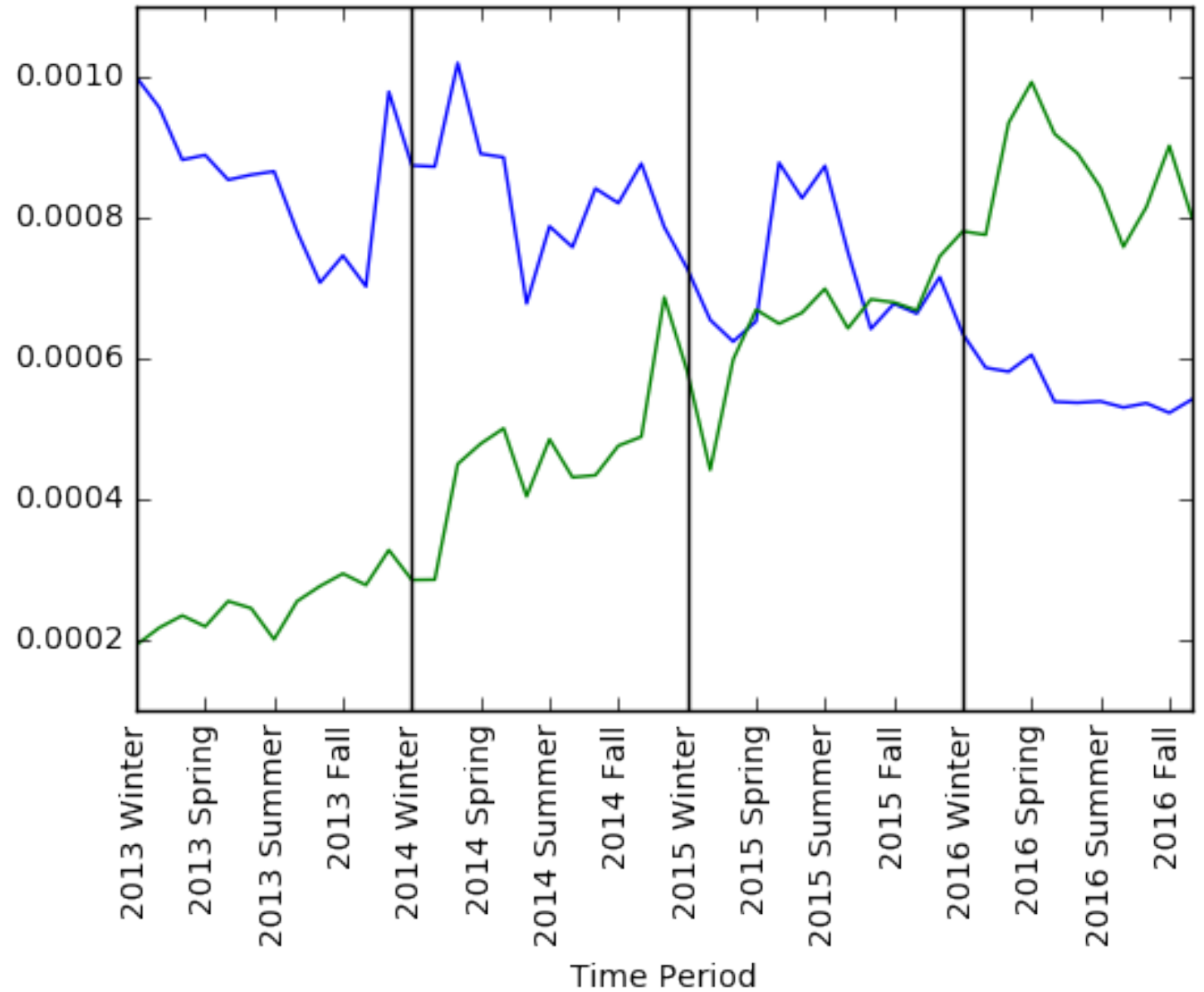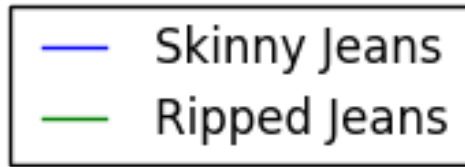Everything is blue his pills his hands his jeans.

Data Cleaning

Add stop words ("saturday","beer", "holiday" and etc)

Add more stop words ("hug","radio","eyes" and etc)

Try different number of topics (15, 20, 30 and etc)

Filter tweets with word "iklan" – advertisement

Filter tweets with lyrics

Filter more tweets with lyrics

Final Model

- Topic #2: skinny, skinny jeans, jeans, ripped skinny, black skinny,
- Topic #4: ripped, ripped jeans, jeans ripped, rippped skinny
- Topic #5: black, black jeans, jeans black, black skinny
- Topic #6: white jeans, white, jeans, girls white, white skinny
- Topic #9: boyfriend, boyfriend jeans, jeans, jeans boyfriend
- Topic #10: leggings, leggings jeans, jeans leggings, jeans
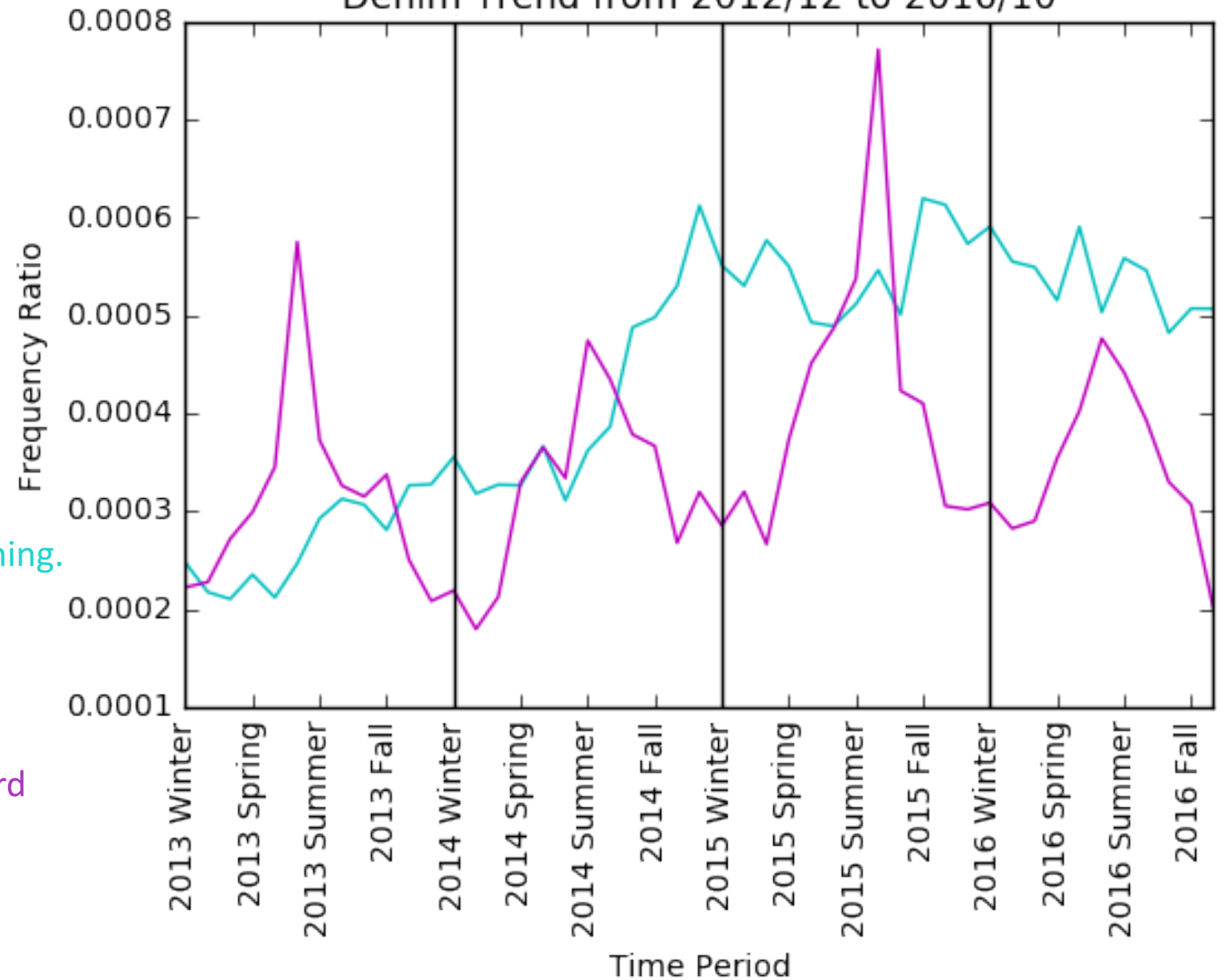- And more…

More fashion Topics!

Denim Trend from 2012/12 to 2016/10

- I like skinny jeans more than I do life
- Did my dad really just buy skinny jeans...

- EVERYONE is wearing ripped jeans this year
- I need some ripped jeans for the fall

Denim Trend from 2012/12 to 2016/10

- I think black jeans are gonna be my new thing.
- IN NEED OF MORE BLACK JEANS

- White jeans kinda day tomorrow?
- Finding a good pair of white jeans is so hard

Application

- Analyzing business topic trend before IPO
- Analyzing political topic trend before political election

Thank you!

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https://github.com/jeewonlee/Project

$$\textbf{NMF} = \textbf{W} * \textbf{H}$$

$$Y = \frac{Sum\ of\ all\ elements\ in\ each\ month}{Number\ of\ tweeets\ in\ each\ month}$$

W Matrix

# of Tweets in 2012/12

Tweets	Date	Topic 1	Topic 2	...	...	...	Topic 28	Topic 29	Topic 30
Black jeans , vans and a cute....	2012/12/01	.0	.0	.0	.0	.0	.012	.001	.004
...	....	...	..	...	...	...	...	...	...
Totally buying mom jeans at ...	2012/12/31	.023	.0	.0	.0	.0	.0	.0	.0
...	...	...	...	...	...	...	...	...	...
...	...	...	...	...	...	...	...	...	...
Check out Vintage Levi's 517	2016/10/01	.002	.012	.0	.0	.0	.001	.0	.0
...	..	...	...	...	...	...	...	...	....
I'm wearing new balance jeans ..	2016/10/31	.0	.0	.0	.0	.0	.012	.002	.001

Sum of All elements in 2012/12