Incentivized Review Prediction

Jiamin Han

Incentivized reviews, at least for Amazon, have become the online review equivalent of fake news — call them fake reviews.

Source: Racked.com

Data

- **Sephora API**
- **1000 Products**
- **1 M reviews**
- **7% incentivized**

MARC JACOBS BEAUTY
Dew Drops Coconut Gel Highlighter
SIZE 0.8 oz/ 24 mL • ITEM 1901982

$44.00
ROUGE FREE SHIPPING

★★★★★ **1K reviews** | ♥ **70K loves**

LinhTrinh
Received free sample

Age 25-34
Skin Type Combination
Skin Tone Olive
Eye Color Brown

★★★★★

18 Apr 2017

Get your summer glow on!

I put a a small dab on the back of my hand and apply it using my beauty blender. I dab a little on at a time and it leaves the most natural looking glow! I LOVE IT! I've tried other liquid and gel highlighters in the past and all were fails. They usually end up rubbing off my foundation or disappear into my base. This coconut del highlighter definitely did not disappoint and will last FOREVER! Would definitely recommend to friends and family.

NOT HELPFUL (0) HELPFUL (35)

“I love this product. It feels amazing!”

Preprocess → **Word2Vec** → **TF-IDF** → **Average** → **K means**

love	0.66	0.85	...	0.19	0.22	X	W1	=	0.66	0.85	...	0.19	0.22	0	1	...	0	0
product	0.01	0.35	...	0.88	0.12		W2											
feel	0.43	0.64	...	0.32	0.76	X	W3	=	0.54	0.21	...	0.99	0.32	0	0	...	1	0
amazing	0.12	0.99	...	0.34	0.86		W4											

Latent topic for this review = | 0 | 1 | ... | 1 | 0 |

Features

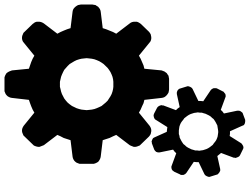
Product & reviewer

Latent topics

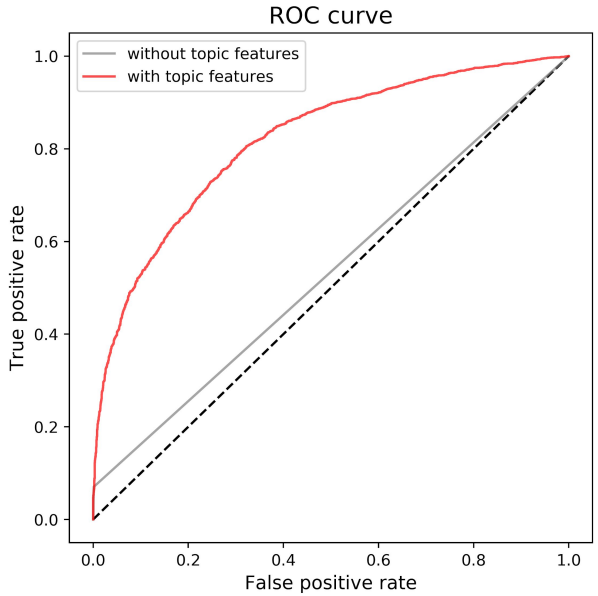
Model

Naive Bayes

Gradient boosting



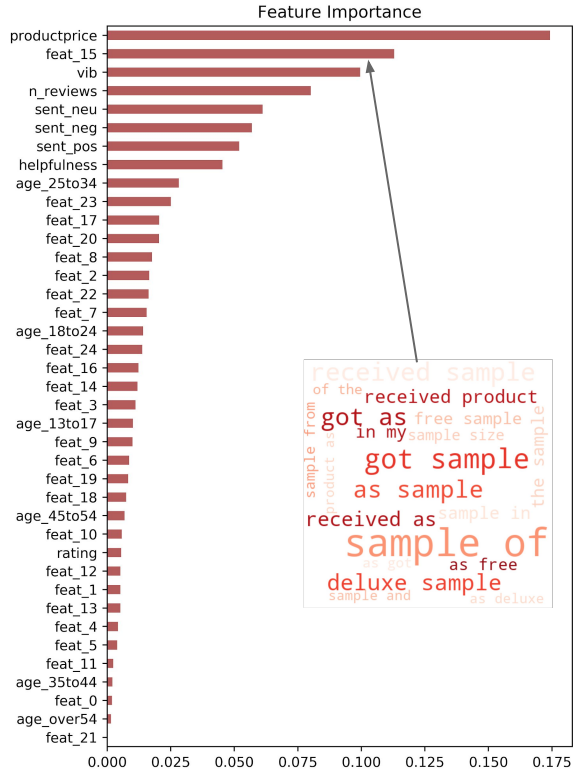
Result



Without topical features:
AUC: 0.53
Recall: 0.25

With topical features:
AUC: 0.75
Recall: 0.76

Conclusion



karensj77

★★★★★

Exceptional results

17 Aug 2016

I am in total awe about the SK-II GenOptics Aura. After two weeks of usage both morning and night I can say my skin feels better, looks smooth and alive. No sensitivity after application and this product is the easiest one cream to apply. Not multiple product, just one dropper and the results are present. Simply amazing and worth every penny. I received the product complimentary in exchange for an honest review. Here is my honesty after 3 weeks of usage.

NOT HELPFUL (0) HELPFUL (0)

Predicted probability:0.90

Labeled incentivized rate: 7%

Predicted incentivized rate: 32%

Future

Deep learning

More feature engineering (e.g. product info, time)

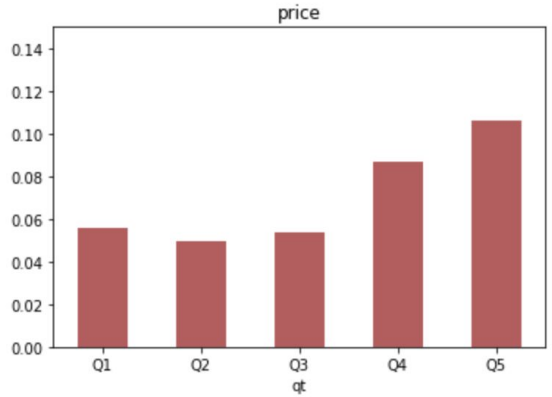
Add products of different categories

Validate model with reviews from other websites

Thanks!

Any questions?

Appendix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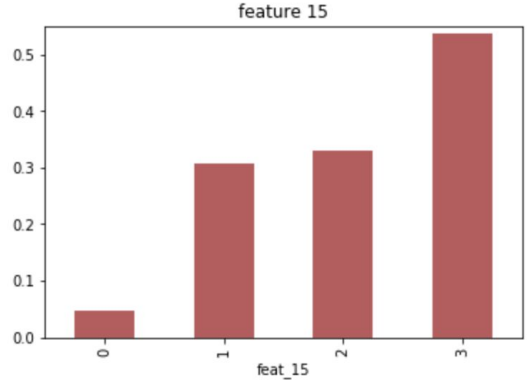
0.10
0.08
0.06
0.04
0.02
0.00
Q1
Q2
Q3
Q4
Q5
qt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0
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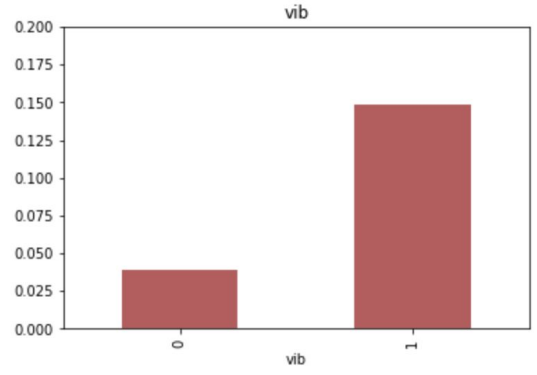
2
3
feat_15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0.025
0.000
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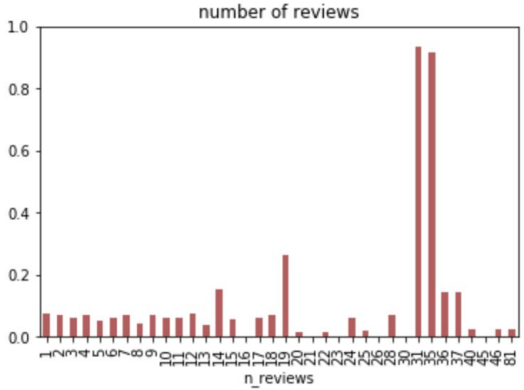
vib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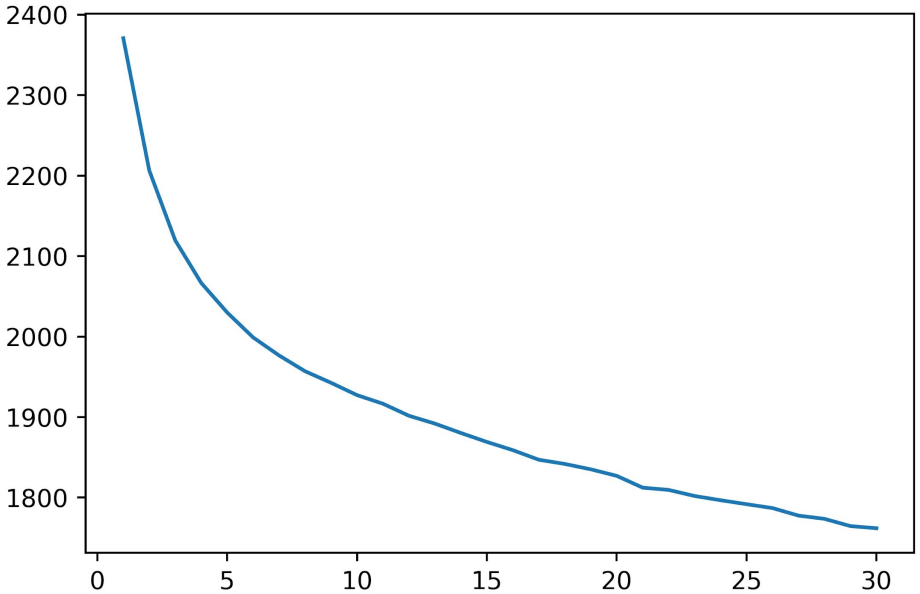
0.4
0.2
0.0
n_reviews

K-Means inertia