

Advertising Data Analysis

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Introduction

- Discover insights into the likelihood of an ad for a certain type of product being clicked on given the sentiment of the surrounding textual content and the gender and age group of the viewer.



Datasets

- products
- product_categories
- log

Methodology

- Python Pandas package
- SQL Database

Products Table

	product	product_URL	product_type
0	Vitamix blender	https://vitamix.com/blenders	blender
1	Lenova laptop	https://lenova.com/laptops	computer
2	InstantPot pressure cooker	https://InstantPot.com/cookers	pressure cooker
3	NemoK blender	http://nemoK.co/blenders	blender
4	Hamilton Beach blender	https://HamiltonBeach/blenders	blender

Product_categories Table

product_type	category	URL_list_unique
0	blender small kitchen appliances	https://www.bostonglobe.com/ , https://abcnews.go.com/ , https://www.latimes.com/ , https://www.al.com/ , https://www.dallasnews.com/ , https://time.com/ , https://www.salon.com/ , https://www.vox.com/ , https://techcrunch.com/ , https://www.independent.co.uk/ , https://www.nydailynews.com/ , https://www.usnews.com/ , https://nypost.com/ , https://www.usatoday.com/ , https://www.nytimes.com/ , https://www.cnn.com/ , https://www.sfgate.com/ , https://www.dailymail.co.uk/ , https://mashable.com/ , https://www.npr.org/ , https://www.cbsnews.com/ , https://www.boston.com/ , https://www.examiner.com/ , https://www.nj.com/ , https://www.theguardian.com/us , https://www.foxnews.com/ , https://www.nbcnews.com/ , https://www.telegraph.co.uk/ , https://www.theatlantic.com/ , https://www.huffingtonpost.com/ , https://www.businessinsider.com/ , https://www.upworthy.com/
1	pressure cooker small kitchen appliances	https://www.buzzfeed.com/ , https://www.latimes.com/ , https://abcnews.go.com/ , https://www.dallasnews.com/ , https://www.nytimes.com/ , https://www.bbc.com/ , https://mashable.com/ , https://www.al.com/ , https://www.dailymail.co.uk/ , https://www.upworthy.com/ , https://www.theguardian.com/us , https://www.examiner.com/ , https://www.nj.com/ , https://www.cnn.com/
2	computer consumer electronics	https://www.nj.com/ , https://www.vox.com/ , https://www.engadget.com/ , https://www.latimes.com/ , https://www.cnn.com/ , https://www.cbsnews.com/ , https://www.dallasnews.com/ , https://www.usnews.com/ , https://www.boston.com/ , https://abcnews.go.com/ , https://www.salon.com/ , https://www.thedailybeast.com/ , https://www.upworthy.com/ , https://www.al.com/ , https://nypost.com/ , https://www.theatlantic.com/ , https://www.msn.com/en-us/news , https://www.businessinsider.com/ , https://www.examiner.com/ , https://www.huffingtonpost.com/ , https://www.nydailynews.com/ , https://techcrunch.com/ , https://www.buzzfeed.com/ , https://www.bostonglobe.com/ , https://www.dailymail.co.uk/ , https://www.telegraph.co.uk/ , https://www.vice.com/en_us , https://www.nbcnews.com/ , https://www.chicagotribune.com/ , https://www.usatoday.com/ , https://www.washingtonpost.com/ , https://www.nytimes.com/ , https://www.mirror.co.uk/news/ , https://www.cnet.com/ , https://www.bbc.com/
3	coffee packaged food	https://www.boston.com/ , https://www.dallasnews.com/ , https://www.dailymail.co.uk/ , https://www.examiner.com/ , https://nypost.com/ , https://www.cnn.com/ , https://www.thedailybeast.com/ , https://www.nytimes.com/ , https://www.vice.com/en_us , https://www.cnet.com/ , https://www.npr.org/ , https://mashable.com/ , https://techcrunch.com/ , https://www.slate.com/ , https://www.washingtonpost.com/ , https://www.vox.com/ , https://www.usatoday.com/ , https://www.usnews.com/ , https://www.bbc.com/ , https://www.telegraph.co.uk/ , https://www.independent.co.uk/ , https://www.nj.com/ , https://www.buzzfeed.com/
4	vitamin health	https://mashable.com/ , https://time.com/ , https://www.nytimes.com/ , https://www.independent.co.uk/ , https://www.vox.com/ , https://www.latimes.com/ , https://www.washingtonpost.com/ , https://www.al.com/ , https://www.mirror.co.uk/news/ , https://www.cnn.com/ , https://www.upworthy.com/ , https://www.engadget.com/ , https://www.boston.com/ , https://techcrunch.com/ , https://www.thedailybeast.com/ , https://www.dallasnews.com/ , https://www.usatoday.com/ , https://www.nydailynews.com/ , https://www.buzzfeed.com/

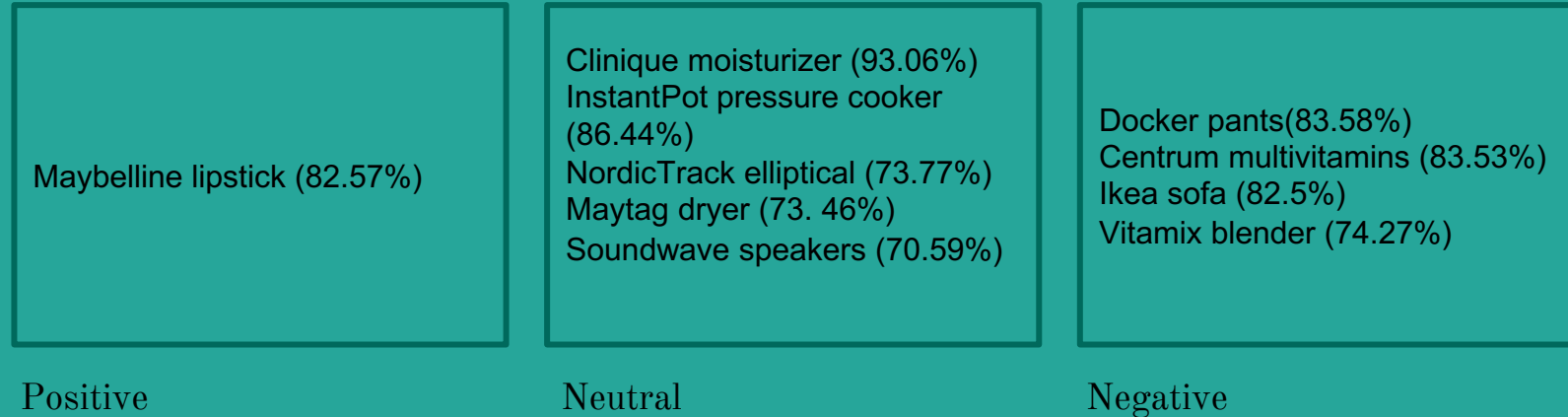
Log Table

	Sentiment	Publication_URL	product_URL	clickORnot	gender	age_group
0	positive	https://www.foxnews.com/	https://lees.com/jeans	0	female	juvenile
1	neutral	https://www.mirror.co.uk/news/	https://coach.com/purses	0	male	young
2	negative	https://www.nbcnews.com/	https://covergirl.co/lipsticks	0	male	middle-age
3	positive	https://www.examiner.com/	https://covergirl.co/makeup	0	male	juvenile
4	negative	https://www.nj.com	https://dell.com/computers	1	female	young

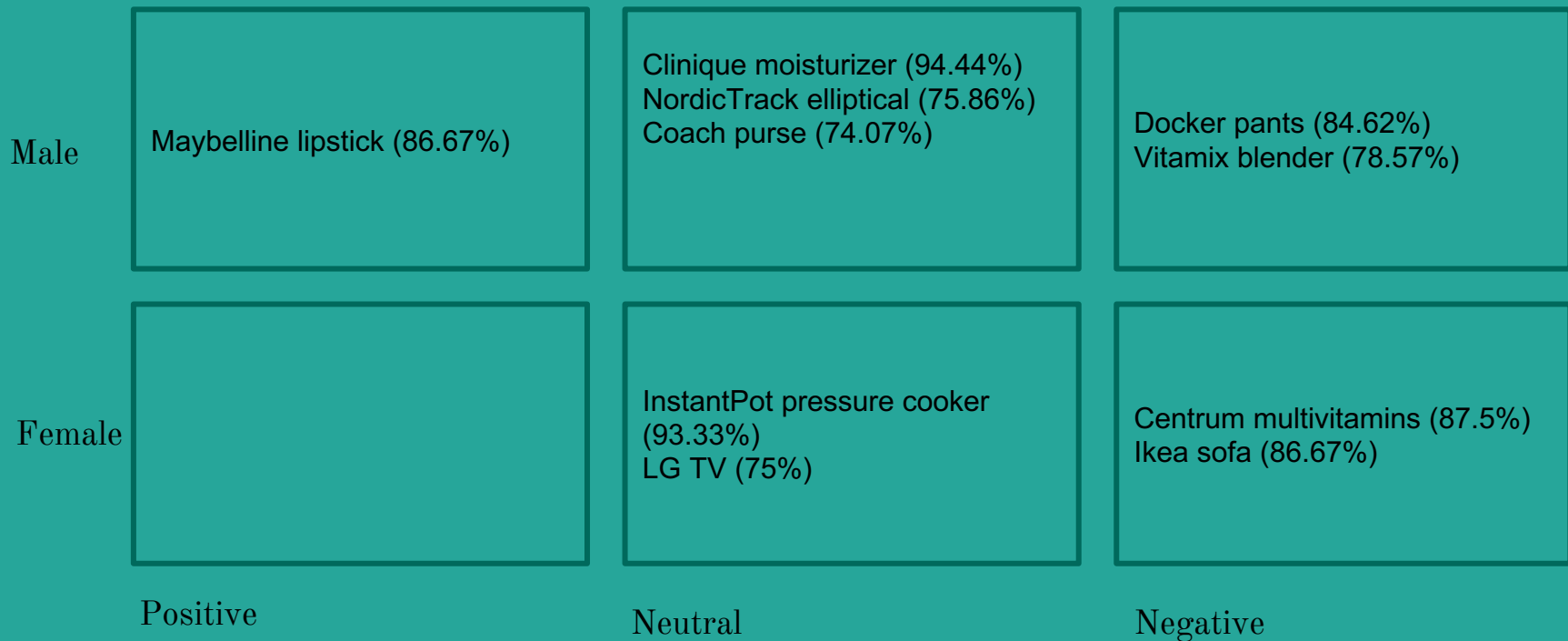
Results

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Top 10 click rates for different products conditioned on sentiment



Top 10 click rates for different products and sentiments conditioned on gender



Top 10 click rates for different products and sentiments conditioned on age group

	Positive	Neutral	Negative
Juvenile	Maytag washer (81.25%)	InstantPot pressure cooker (90.91%) NordicTrack elliptical (86.67%)	Clinique moisturizer (94.74%) Centrum multivitamins (90%)
Middle-age	Maybelline lipstick (92.31%)	Coach purse (78.26%)	Docker pants (90.48%) Ikea sofa (87.1%)
Senior	Maytag washer (81.25%)	InstantPot pressure cooker (90.91%) NordicTrack elliptical (86.67%)	Clinique moisturizer (94.74%) Centrum multivitamins (90%)
Young	Maybelline lipstick (92.31%)	Coach purse (78.26%)	Docker pants (90.48%) Ikea sofa (87.1%)

Limitations

- In the log file, we only have 10000 rows of data for 50 products, can potentially gather more information to conduct a more rigorous analysis
- The whole study doesn't consider interaction effects when making recommendations, in the future, one should measure how gender and age group together affect the click rate for different products based on different sentiments

Thank you for watching !

