

# Reviews Worth Paying Attention To

Kevin Lin

# In-N-Out Burger

Claimed



395 reviews

Details

★ Write a Review

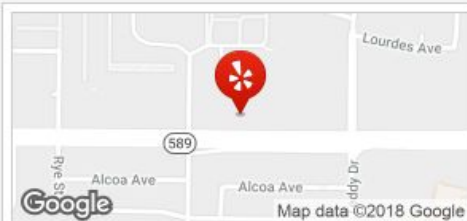
Add Photo

Share

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\$ - Fast Food, Burgers

Edit



2900 W Sahara Ave  
Las Vegas, NV 89102  
Westside

Edit

Get Directions

(800) 786-1000

in-n-out.com

Send to your Phone



"Finally my job brought me to Vegas where I was free to have my first **Double Double!**"  
in 40 reviews



"oh **east coast**, u know we da best coast: but I'm woman enough to say we lack the sweet yumminess of this establishment." in 30 reviews



"Don't forget to ask for **grilled onions** on your burger, and get the fries well done!"  
in 26 reviews



Today 10:30 am - 1:00 am **Open now**



**Full menu**

\$\$\$

Price range **Under \$10**

No hidden fees,

# Yelp Relies on Users to Determine Usefulness

★★★★★ 7/22/2018

The BEST Burger in fast food.

💡 Useful 26

A Double Double Animal Style is the superlative burger in a fast food restaurant I have ever had and it could very well be the best burger I have had period. New York's Shake Shack is the only burger that I would say is even on this tier of excellence. That said, In-N-Out Burger is the mother of all burgers and at its price point, it is the cheapest gourmet experience you could possibly have. This is not hyperbole.

The menu is basic and just about everyone knows about the worlds worst kept "secret" menu but if you just woke up from a 40-year coma, a simple google search will provide all you need to know. I always go animal style which is the basic Double Double along with added pickles, extra spread, grilled onions, and mustard fried onto each meat patty. Six dollars gains you admission to Heaven.

This specific location is a complete tourist trap complete with a store pimping out branded Hats, Shirts, Stickers, and anything else you can think of. The restaurant is gigantic compared to the average In N Out in SoCal. With that in mind, try to avoid the 11:30am to 1:30pm rush in you can, it can get packed in this beezy! They move the lines with incredible efficiency so it is actually finding seating that becomes the issue, even after they added tables outdoors in a recent addition. I suggest you go now.

Once again, In-N-Out is BEST Burger in fast food.

★★★★★ 4/27/2018

I can't say this one is any better than the other 100 they have on this side of the world, but they just don't have them on the east coast.

💡 Useful

In-N-Out Burger is great. Amazing burgers and fries. Make sure you ask for animal style and they put all kinds of wackiness on it.

# Benefits Everyone Involved

Customers



Restaurant Owners



# NLP Workflow

Example Review

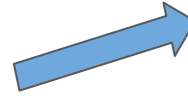
"The burger was  
ok,... the fries  
got stale as they  
cooled off"

Tokenize



['the', 'burger',  
'was',... 'off']

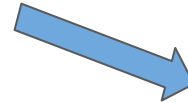
LSA w/  
Word  
Count



Topic 1



Topic 2



Topic 3

# Topics

## Miscellaneous

**menu** 0.18999

**really** 0.16964

**cheese** 0.16599

**well** 0.15494

**would** 0.14697

**line** 0.14443

**onions** 0.14037

**love** 0.13951

**even** 0.13824

**people** 0.13812

## Ingredients/Menu

**cheese** 0.37031

**menu** 0.27129

**grilled** 0.27123

**onions** 0.26768

**extra** 0.23946

**secret** 0.18233

**meat** 0.13790

**lettuce** 0.11989

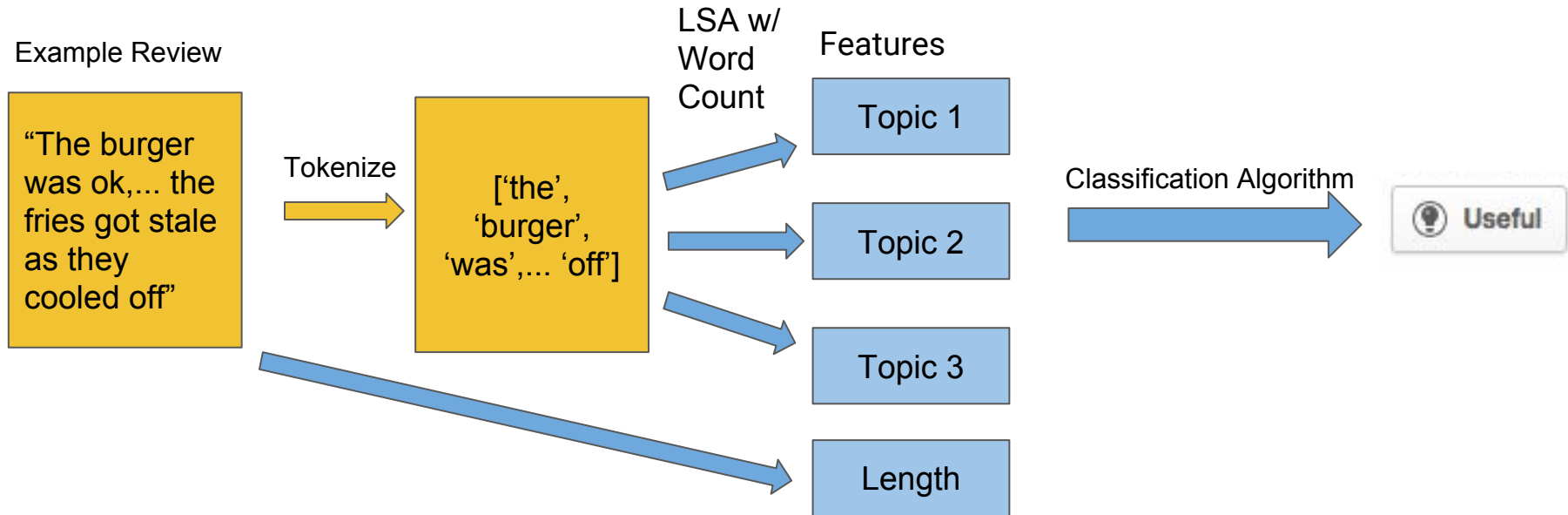
## Drive Thru

**drive** 0.47977

**thru** 0.37801

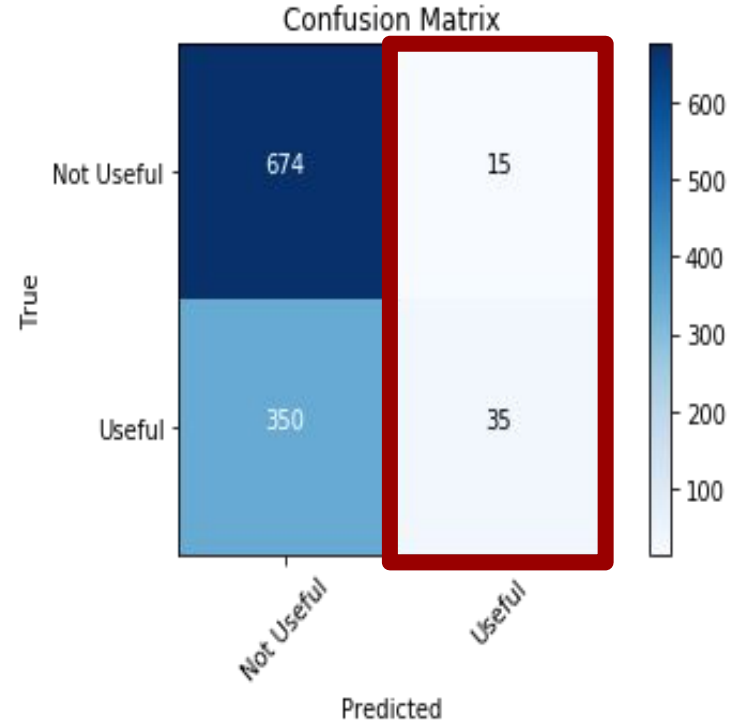
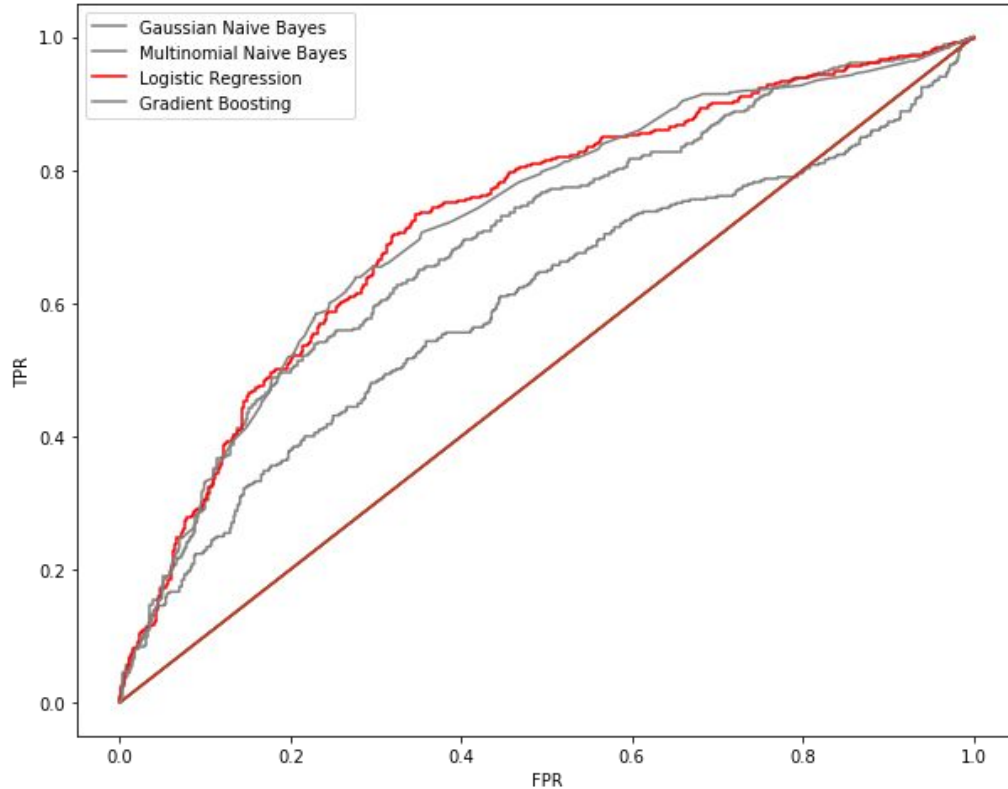
**line** 0.22317

# Using Topics as Features



# Logistic Regression Performs Best

ROC Curves of Different Algorithms





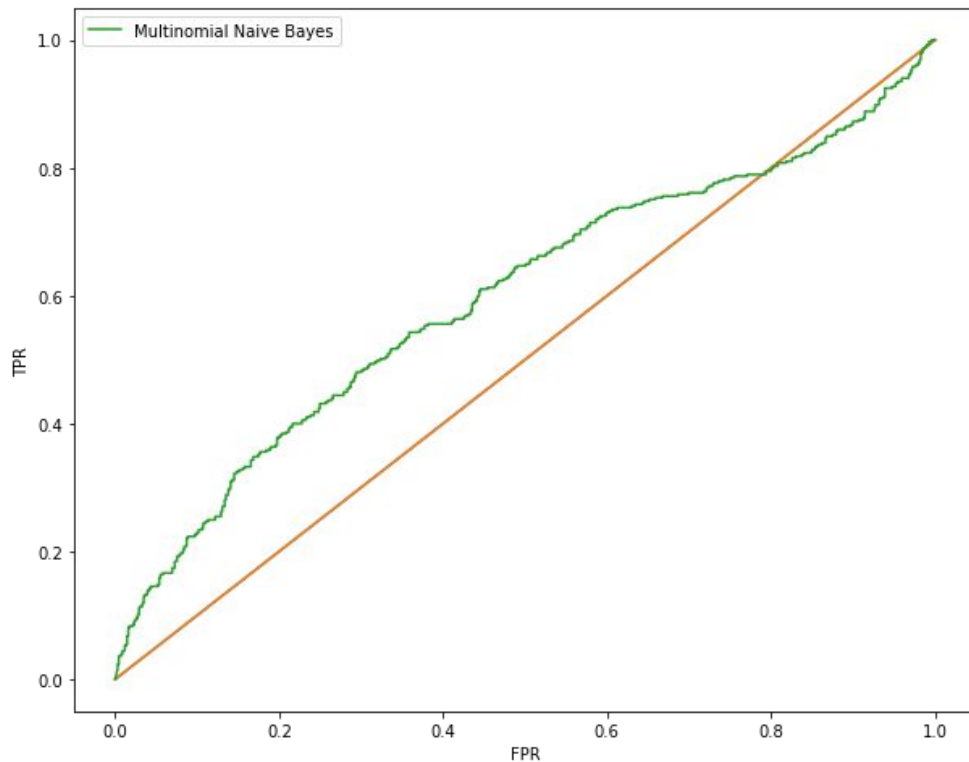
# Future Work

- Use Word2Vec models to produce word embeddings
- Gather reviewer information to use as features
- Create a survey of yelp reviews for people to vote on to establish a better ground truth

Questions?

# Appendix

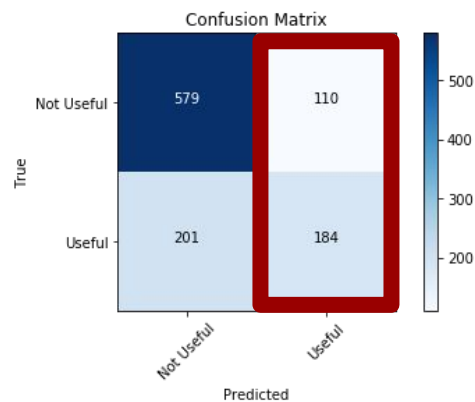
# Multinomial Naive Bayes w/ Count Vectors



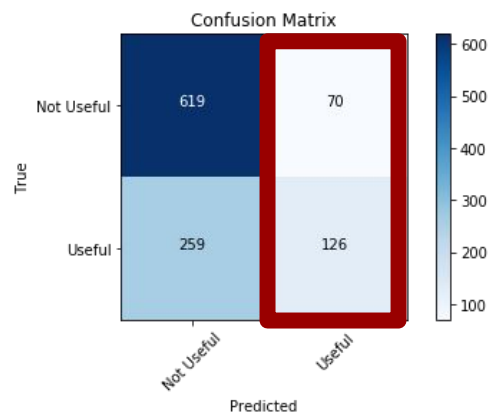
# Table Comparing Performance of Models

Unnamed: 0		Algorithm	Auc_test	Auc_train	Number of Topics	Parameters	Polarity	Precision	Recall
15	15	Logistic Regression	0.724664	0.693508	3	{'C': 0.1}	1.0	0.647668	0.324675
4	4	Logistic Regression	0.722625	0.693229	2	{'C': 10}	0.0	0.635417	0.316883
7	7	Logistic Regression	0.720529	0.694396	3	{'C': 10}	0.0	0.647668	0.324675
8	8	Gradient Boosting	0.720121	0.700771	3	{'learning_rate': 0.1, 'max_depth': 2, 'n_esti...	0.0	0.652482	0.238961
10	10	Logistic Regression	0.719756	0.693229	4	{'C': 20}	0.0	0.639594	0.327273
16	16	Gradient Boosting	0.718996	0.701180	3	{'learning_rate': 0.01, 'max_depth': 2, 'n_est...	1.0	0.652482	0.238961
2	2	Gradient Boosting	0.718463	0.698783	5	{'learning_rate': 0.1, 'max_depth': 1, 'n_esti...	0.0	0.652482	0.238961
11	11	Gradient Boosting	0.718084	0.703504	4	{'learning_rate': 0.01, 'max_depth': 2, 'n_est...	0.0	0.652482	0.238961
5	5	Gradient Boosting	0.717443	0.700158	2	{'learning_rate': 0.01, 'max_depth': 2, 'n_est...	0.0	0.652482	0.238961
13	13	Logistic Regression	0.711907	0.697092	10	{'C': 1}	0.0	0.612245	0.311688
1	1	Logistic Regression	0.710863	0.690428	5	{'C': 1}	0.0	0.642487	0.322078
14	14	Gradient Boosting	0.705628	0.715744	10	{'learning_rate': 0.01, 'max_depth': 2, 'n_est...	0.0	0.647482	0.233766
6	6	GaussianNB	0.697393	0.665735	3	Null	0.0	0.653061	0.332468
9	9	GaussianNB	0.691806	0.664537	4	Null	0.0	0.631068	0.337662
3	3	GaussianNB	0.685289	0.672923	2	Null	0.0	0.642424	0.275325
0	0	GaussianNB	0.683426	0.650559	5	Null	0.0	0.562674	0.524675
12	12	GaussianNB	0.662225	0.663566	10	Null	0.0	0.490798	0.623377

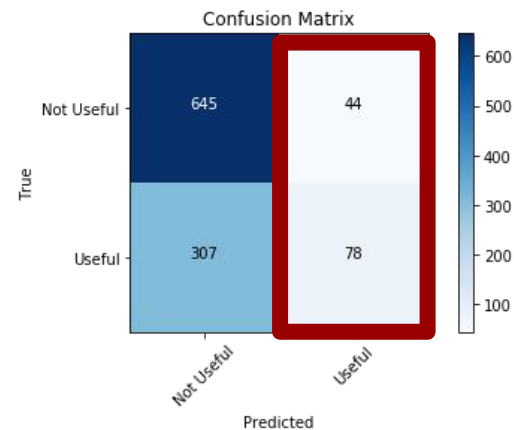
Threshold = 0.45



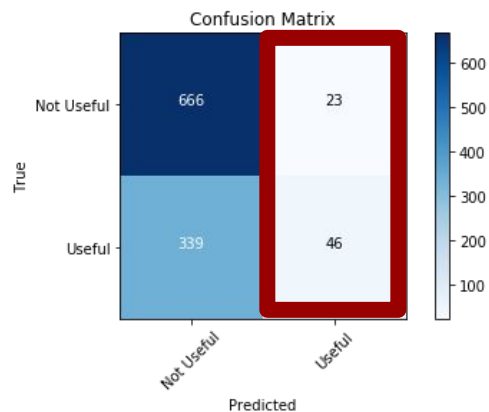
Threshold = 0.5



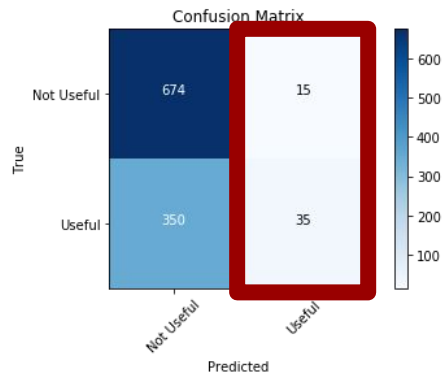
Threshold = 0.55



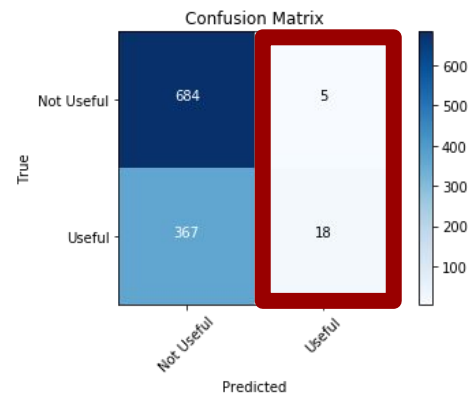
Threshold = 0.6



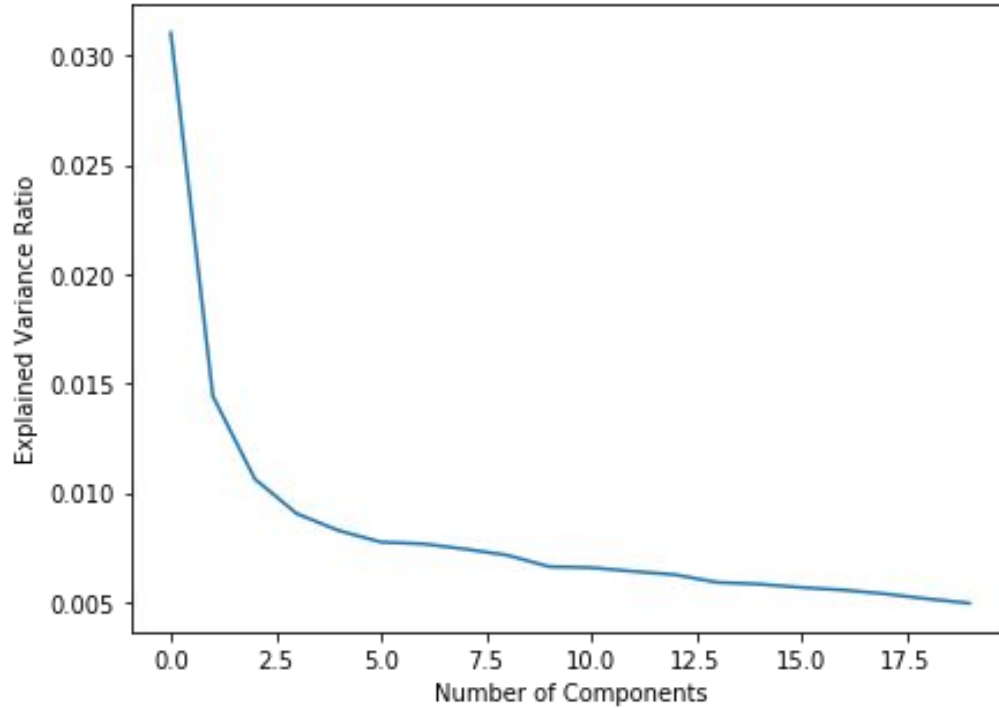
Threshold = 0.65



Threshold = 0.8



# Explained variance vs Number of components







# Data

- Yelp Dataset
  - 3500 Reviews
  - 12 In-N-Out Burger Restaurants in Las Vegas