



YELP RESTAURANT REVIEW

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# *Fine Grained Sentiment Analysis*

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Prepared by Food Lover

# *Meet the Team*



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Data Scientist

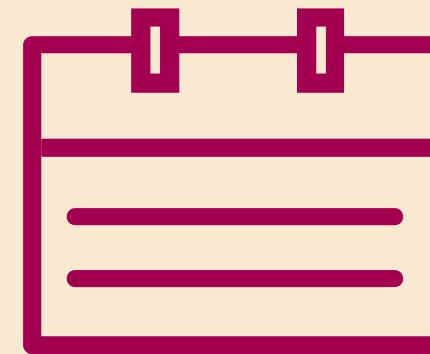
# *Overview*



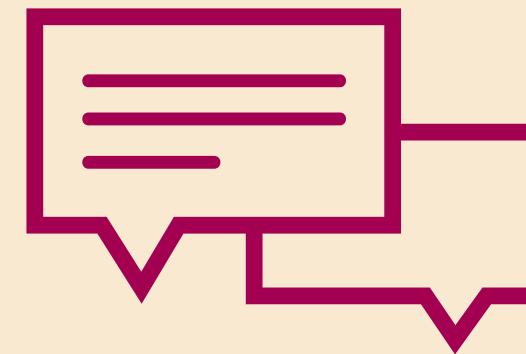
Introduction  
Problem Statements  
Proposed Solution  
Methodology  
Technology Stacks  
Prototype  
Demo

# ***Yelp as Business Directory***

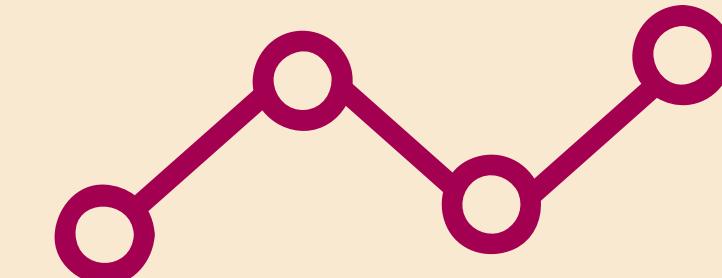
***Platform to grow business and interact with customer***



Advertise the business as marketing initiative and manage booking/order via the platform



Build meaningful relationship by interacting with customer and responding to their reviews



Track business performance by activity feed or lead management via Yelp for Business Owners App

# *Why Fine Grained Sentiment?*

## *Performance Index provided is limited*

### BUSINESS

### PERFORMANCE

### UNDERSTANDING

More precise result on sub-sentence level to understand performance of different business dimensions. Restaurant as service industry would have its specific metrics to define success

### RESOURCE

### LIMITATION

It is cost and labor intensive to conduct traditional market survey or perform manual analysis. While restaurant require large sum of capital and fixed cost, it is wiser to allocate fund for targeted aspect where business need to improve

### SERVE CUSTOMER

### BETTER

Understand how people evaluate your food or service, as well as identifies which feature or aspect they concern the most. Personalize customer experience by the characteristics of the customers that gave similar feedback



# *Methodology*

## DATA ACQUISITION

- Collect data set from Yelp and store in DB2
- Randomly extract ~50k+ sentiments for restaurants in Pennsylvania (accommodate to lite version capacity)
- Extract relevant users

## ENTITY SENTIMENT

- Identify emotion and sentiment of keywords selected using IBM Watson NLU Keyword Analysis\*\*

## ASPECT CLASSIFICATION

- Extract relevant keywords using Glove 6B word2vec (300D) and five aspects of evaluation, namely food taste, service, cleanliness, price and location

## DASHBOARD CREATION

- Store transformed data set into DB2 for visualization
- Summarize the predicted emotion and sentiment by important data dimensions such as date time, user, location, etc.
- Build business dashboard using IBM Cognos



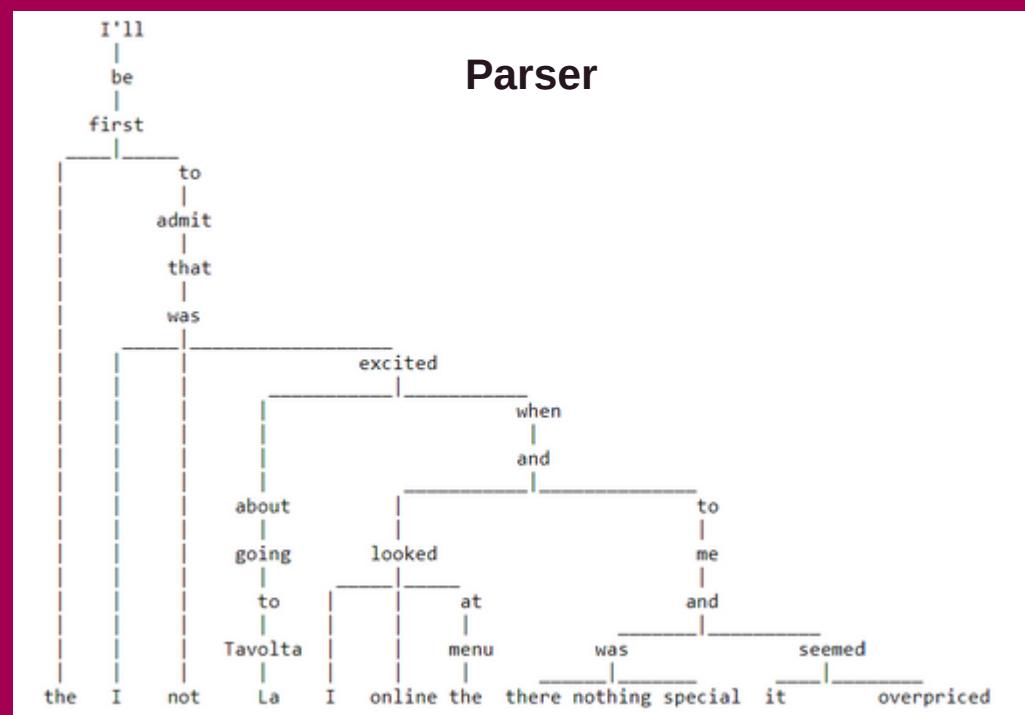
\*\* Due to limitation in lite version, some reviews are processed using TDSA (Target Dependent Sentiment Analysis published by Wang et al. in Bella

# Fine Grained Sentiment Analysis

## How it works

### User Review

I'll be the first to admit that I was not excited about going to **La Tavolta**. Being a food snob, when a group of friends suggested we go for dinner I looked online at the **menu** and to me there was nothing special and it seemed overpriced. Im also not big on ordering **pasta** when I go out. Alas, I was outnumbered. Thank goodness! I ordered the **sea bass special**. It was to die for. Cooked perfectly, seasoned perfectly, perfect portion. I can not say enough good things about this **dish**. When the **server** asked how it was he seemed very proud of the dish and said, " doesn't she (the **chef**) do an incredible job?" She does. My hubby got the **crab tortellini** and also loved his. I heard "mmmm this is so good" from all around the table. Our **waiter** was super nice and even gave us free **desserts** because we were some of the last people in the restaurant. **Service** was very slow and the **place** was PACKED but we had our **jugs of wine** and a large group with good conversation so it didn't seem to bother anyone. So- Do order the **calamari** and **fried zucchini appetizers**. Leave out the **mussels**. If they have the **sea bass special**, I highly recommend it. The **chicken parm** and **crab tortellini** were also very good and very big. The **chicken Romano** was a bit bland. The **house salads** were teeny. Do make a **reservation** but still expect to wait for your **food**. Go with a large group of people and plan for it to be loud. Don't go with a date unless you're fighting and don't feel like hearing anything they have to say. Ask to sit in the side room if it's available.



### Prediction

```
{ "text": "chicken parm","sentiment": {"score": 0.982727, "label": "positive"}, "relevance": 0.660007, "emotion": { "sadness": 0.127255, "joy": 0.718236, "fear": 0.067132, "disgust": 0.080186, "anger": 0.017943 }, "count": 1 }
```



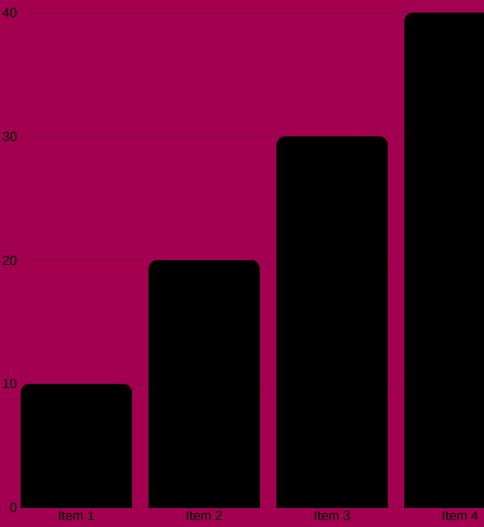
### Aspect Classification

```
[{"food": {"sentiment": 0.518, "joy": 0.616}, {"location": {"joy": 0.325, "sadness": 0.458}}, {"service": {"sentiment": 0.319, "joy": 0.69}}]
```

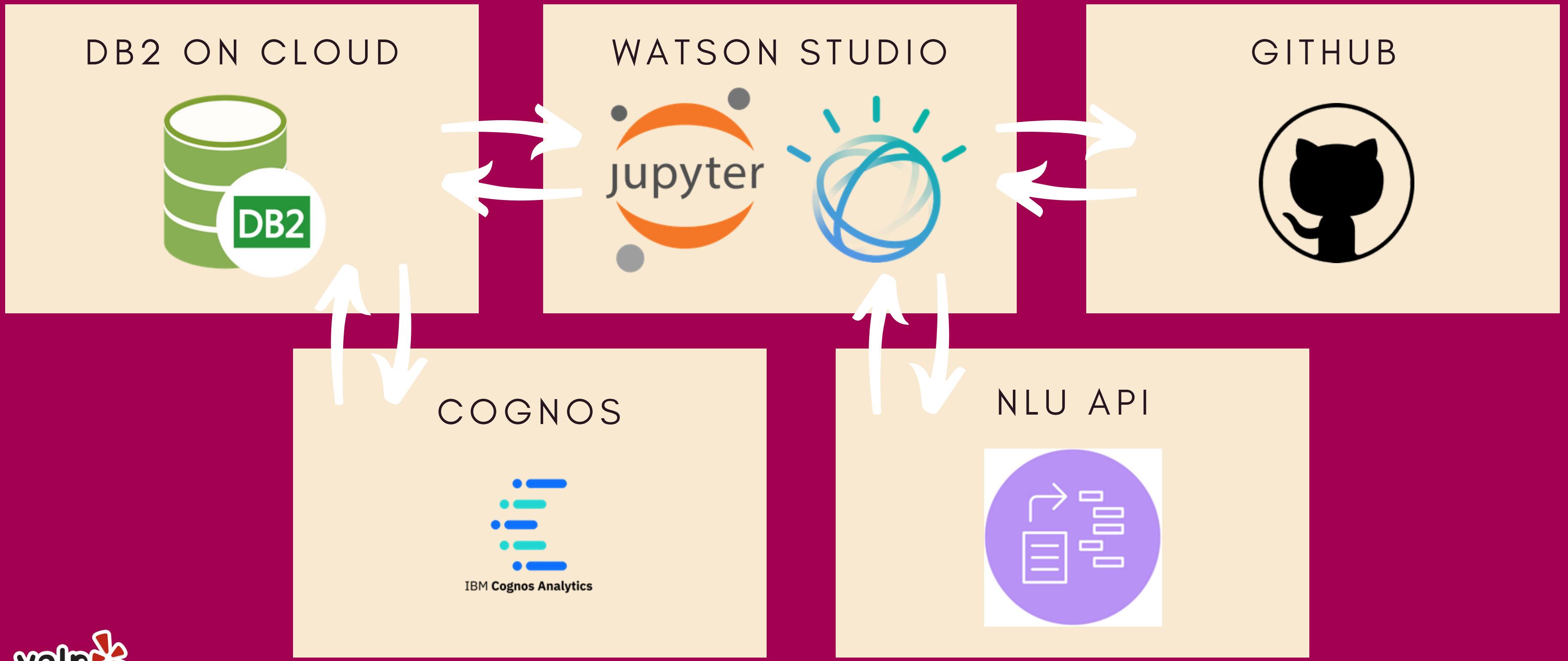
### Linear SVC/LSTM/LSTM-CNN



### Summary Statistics



# *Technology Stacks*

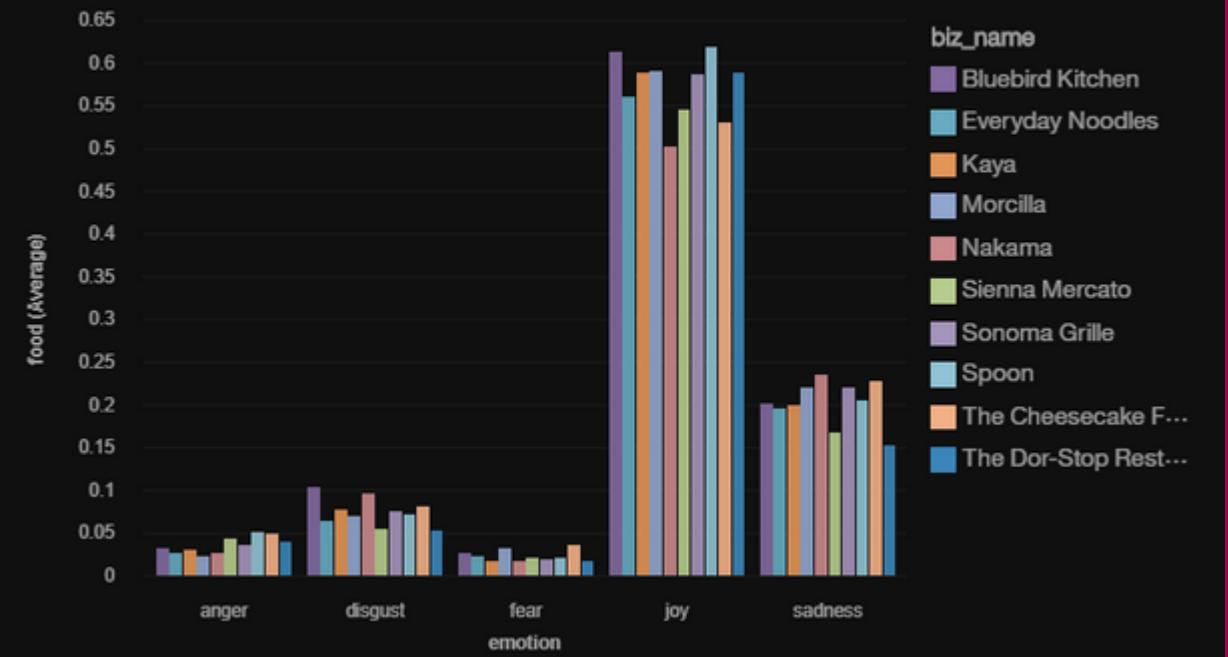


# Dashboard Prototypes

BI Dashboard for Restaurant Owners



Food



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**KEEP CALM  
AND  
IT'S DEMO TIME**

**FOOD IS ALWAYS A GOOD IDEA!**

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*THANK YOU*

FROM FOOD LOVER