

ORACLE

# Best Practices on Designing Intents

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# Program agenda

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- 1 A quick start introduction to NLP
- 2 Best practices for designing intents
- 3 Enhancing the model using the unresolved intent
- 4 NLP is a classification task

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## Encoding words as numbers

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listen

76, 73, 83, 84, 69, 78

ASCII

silent

83, 73, 76, 69, 78, 84

ASCII

## Tokenization

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I love my dog

[1,2,3,4]

I love my cat

[1,2,3,5]

## Challenges

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I love my club

[1,2,3,6]

soda

together

golf

sport

sandwich

playing card

# Sentence encoding

Encodes text into high dimensional vectors

- Array of numbers
- Each element becomes single point in vector space

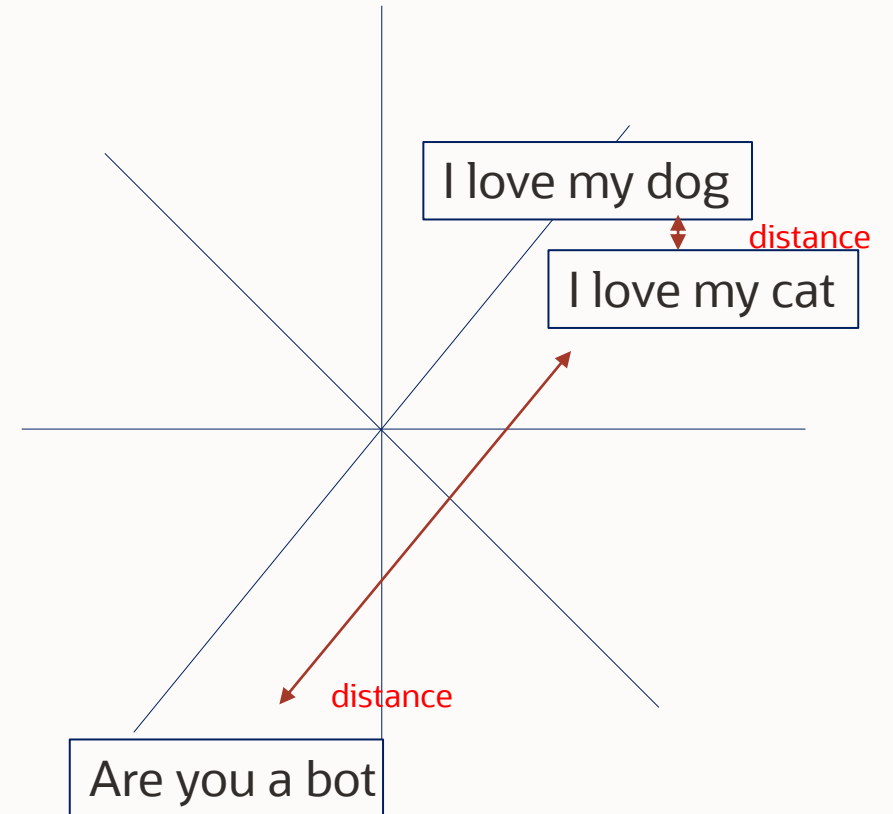
Embeddings

- "lookups" allowing to track similarities and relations

Pre-trained models

- You "refine" model by adding training utterances

high-dimensional vector



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## Why good intent design is important

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” Cars are designed, databases are designed, intents should also be designed

Easier maintenance

More successful intent classification

Easier Digital Assistant routing

# Best practices for designing intents

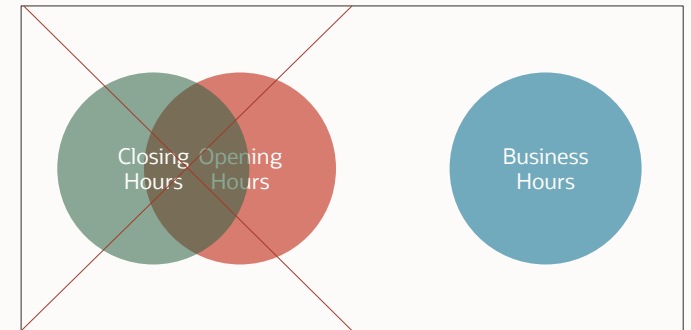
## Partitioning intents

Each intent should be as “linguistically spaced” as possible

- Focus on what makes an intent unique
- You can think of intents mapping to use cases

What goes to making a good NLP model?

- Have well defined intents
  - Should have a clear focus and purpose
  - Singular linguistic focus as much as possible
  - Think “what makes this intent unique”
- 
- Remember there are different ways to state an intent
    - Utterances define intents
    - “Please reset password” vs “I can’t log in to my account” vs “my password got hacked”
  - There is no “understanding”. This is a classification problem



# Best practices for designing intents

## Partitioning intents

Test your model early on to see how it copes

- If you don't then it's just all guesswork

Always be willing to refactor intents

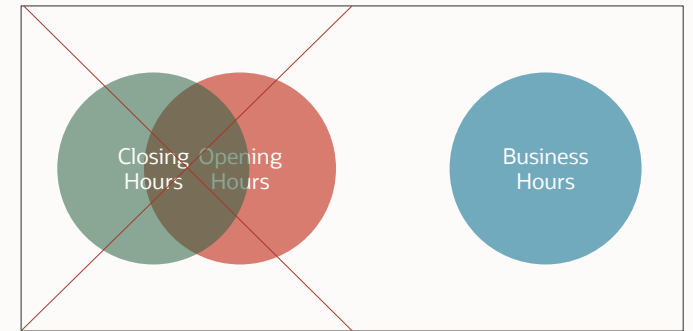
- Separating intents gives the chance for different responses

There are no hard and fast rules but:

- 2 intents are too few, 500 intents per skill is probably too many

Always use multiple Skills and a Digital Assistant

- Ideally each skill should have a common linguistic theme



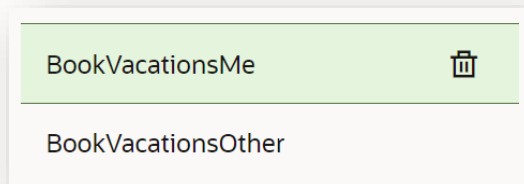
# Real world intent design in action


*“I want to book a day off for me” vs “I want to book a day off for Frank Nimphius”*

- The above intents are very linguistically close
- Using entities to derive meaning (with trigger words) is a point of failure

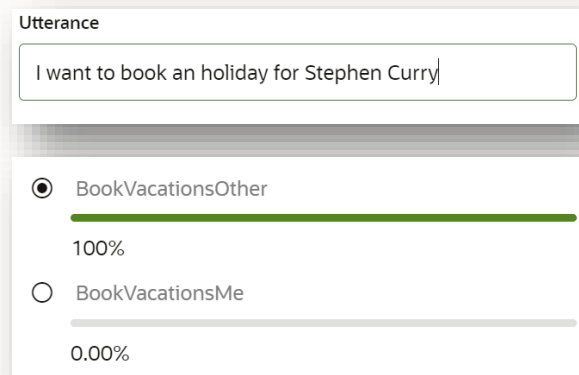
The model can be smart if it is well design and trained

- Properly trained, the model can easily distinguish the below intents
- No need to use entities
- NLP should do the heavy lifting



BookVacationsMe 

BookVacationsOther

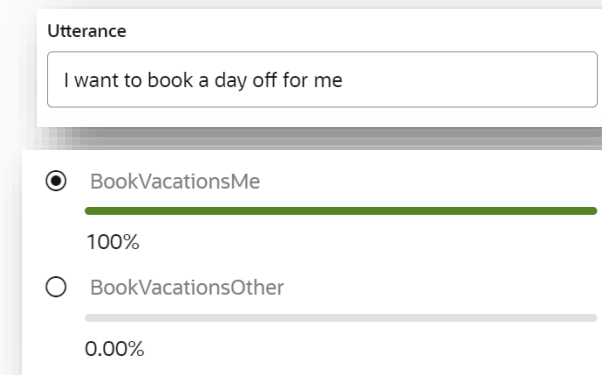


Utterance

I want to book an holiday for Stephen Curry

BookVacationsOther  
100%

BookVacationsMe  
0.00%



Utterance

I want to book a day off for me

BookVacationsMe  
100%

BookVacationsOther  
0.00%



# Enhancing the model using the unresolved intent

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How well can you read this  
text

How well can you read this  
text

How well can you read this  
text

# Best practices for designing intents

## Partitioning skills

- Partition skills
  - Easier for development and reuse
  - Ideally a skill should focus on commonality
    - Use case
    - Linguistics
  - But ideally unique compared to other skills
- Digital assistant routing is more efficient with a cleaner separation of skills



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# Enhancing the model using the unresolved intent

The unresolvedIntent gives the intents contrast

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ODA will automatically generate an **out of domain** model

- By establishing the “theme/domain” of a skill based on its utterances
  - Skill that handles banking tasks doesn't take pizza orders
- No need to specifically train unresolvedIntent

We can train the model for **explicit out of domain OR out of scope**.

- Use unresolvedIntent to help clarify what an intent is NOT
- We have an intent for symptoms of colon cancer
  - This should not fire for any other type of cancer
- Collect out of scope utterances and train the unresolvedIntent with them

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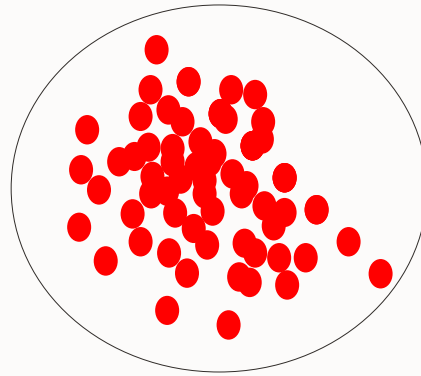
”

What if I could see inside the model?

# NLP is a classification task

Well-formed model

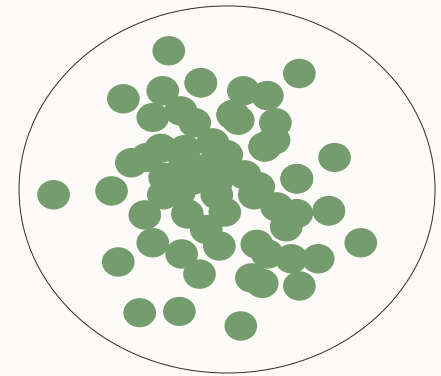
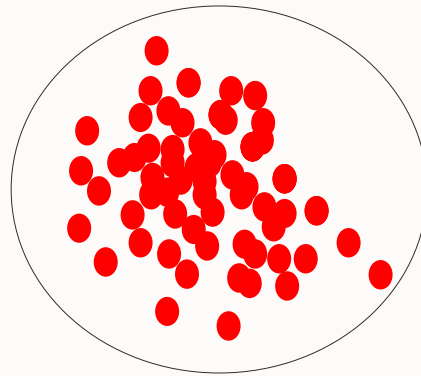
- Clearly defined Intent



# NLP is a classification task

Well-formed model

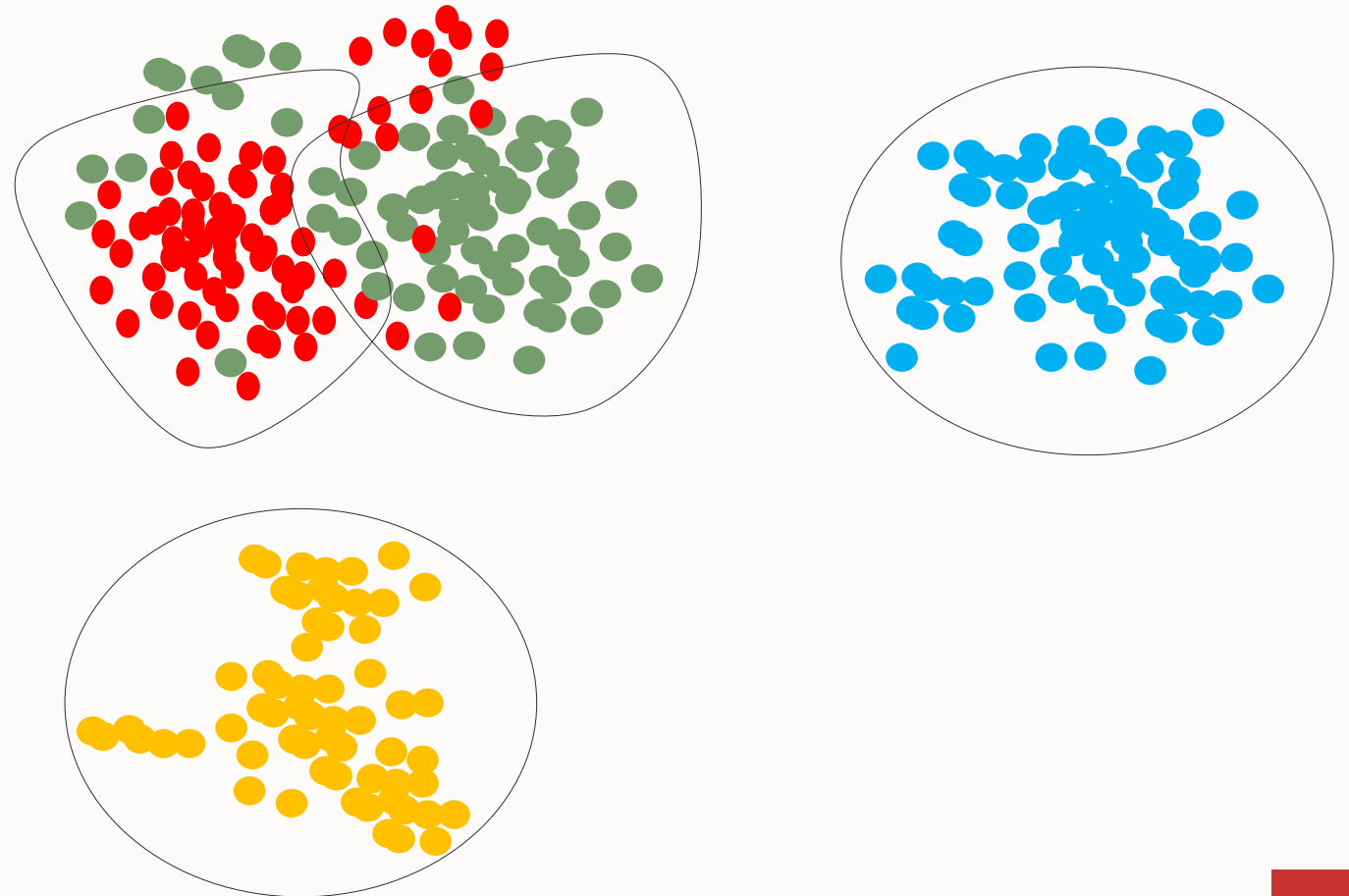
- Clearly defined Intent
- Intent's borders do not overlap



# NLP is a classification task

## Overlapping intents

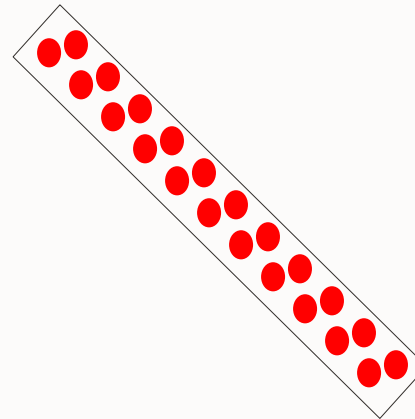
- Difficult for the NLP to properly classify utterances
- Specially those in the overlapping area
- This creates more disambiguations



# NLP is a classification task

Formulaic and overfitting

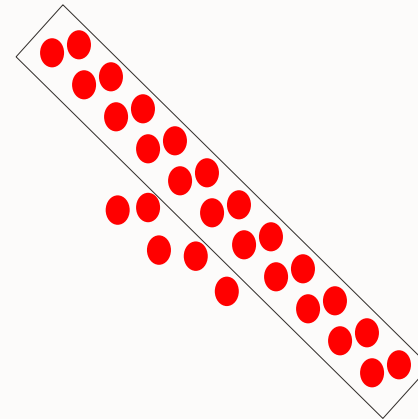
- Lack of variation in the training data causes this
- It does not reflect real life
- Any input slight different would fall outside the intent



# NLP is a classification task

Formulaic and overfitting

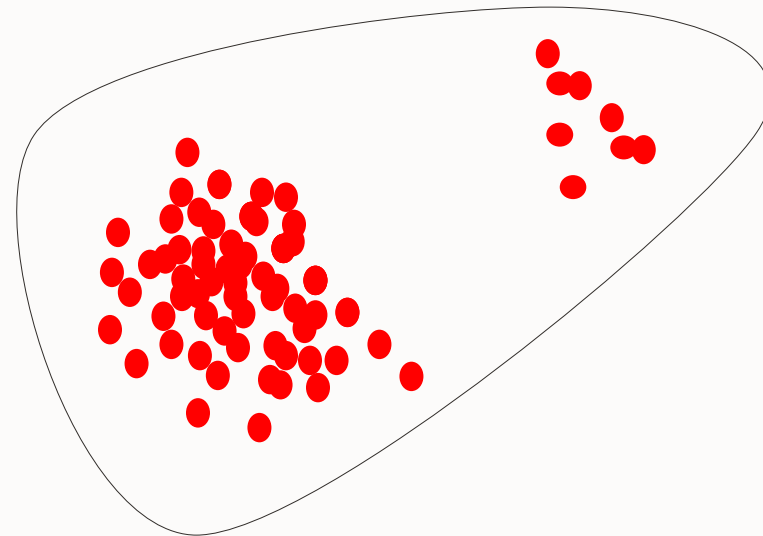
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# NLP is a classification task

## “Big bucket” intents

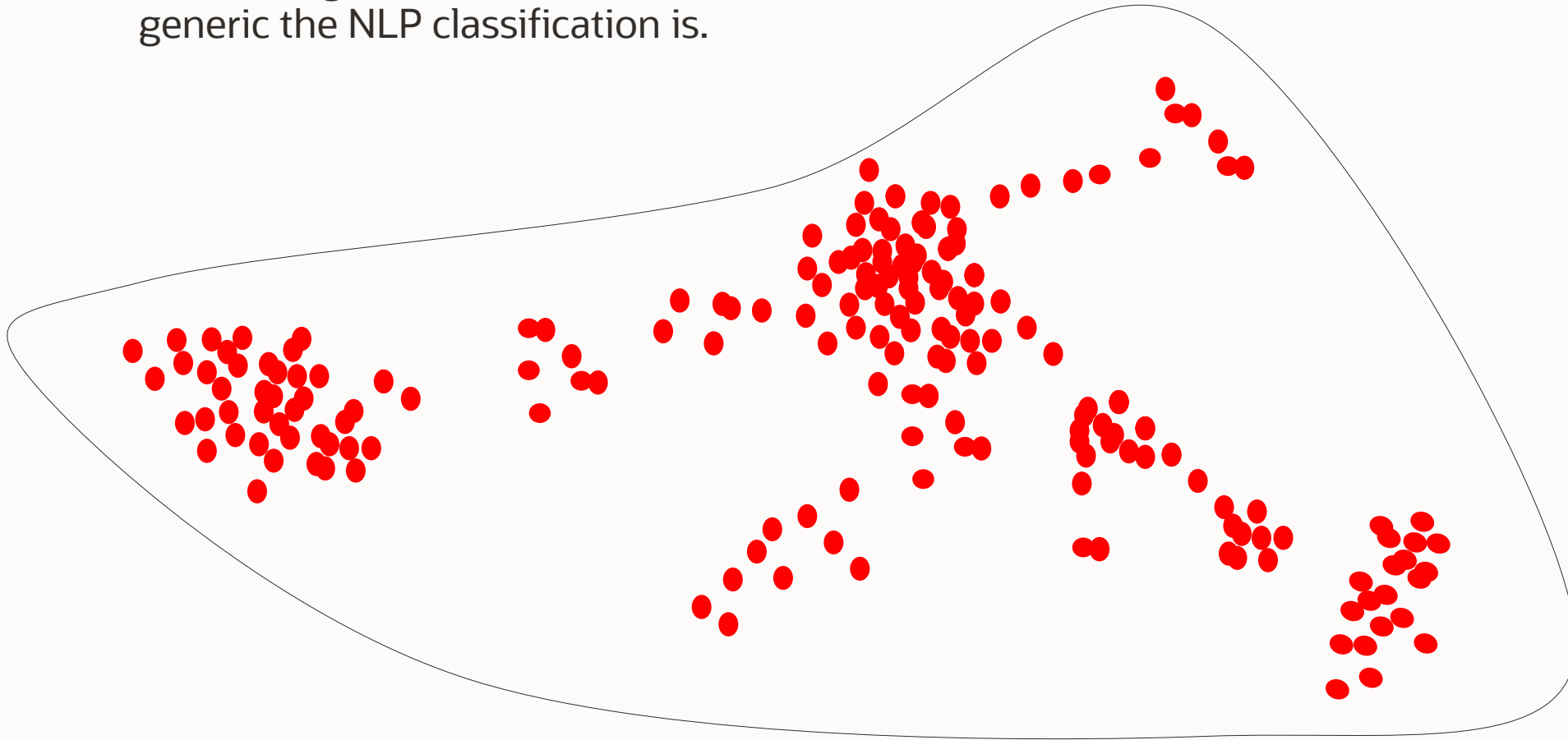
- Think about a Pizza intent where we accept “Order Pizza” and “Cancel Pizza” as utterances
- Need to use entity slotting to actually derive meaning
- The NLP is smart enough, there is no need to create such generic intents



# NLP is a classification task

“Big bucket” intents

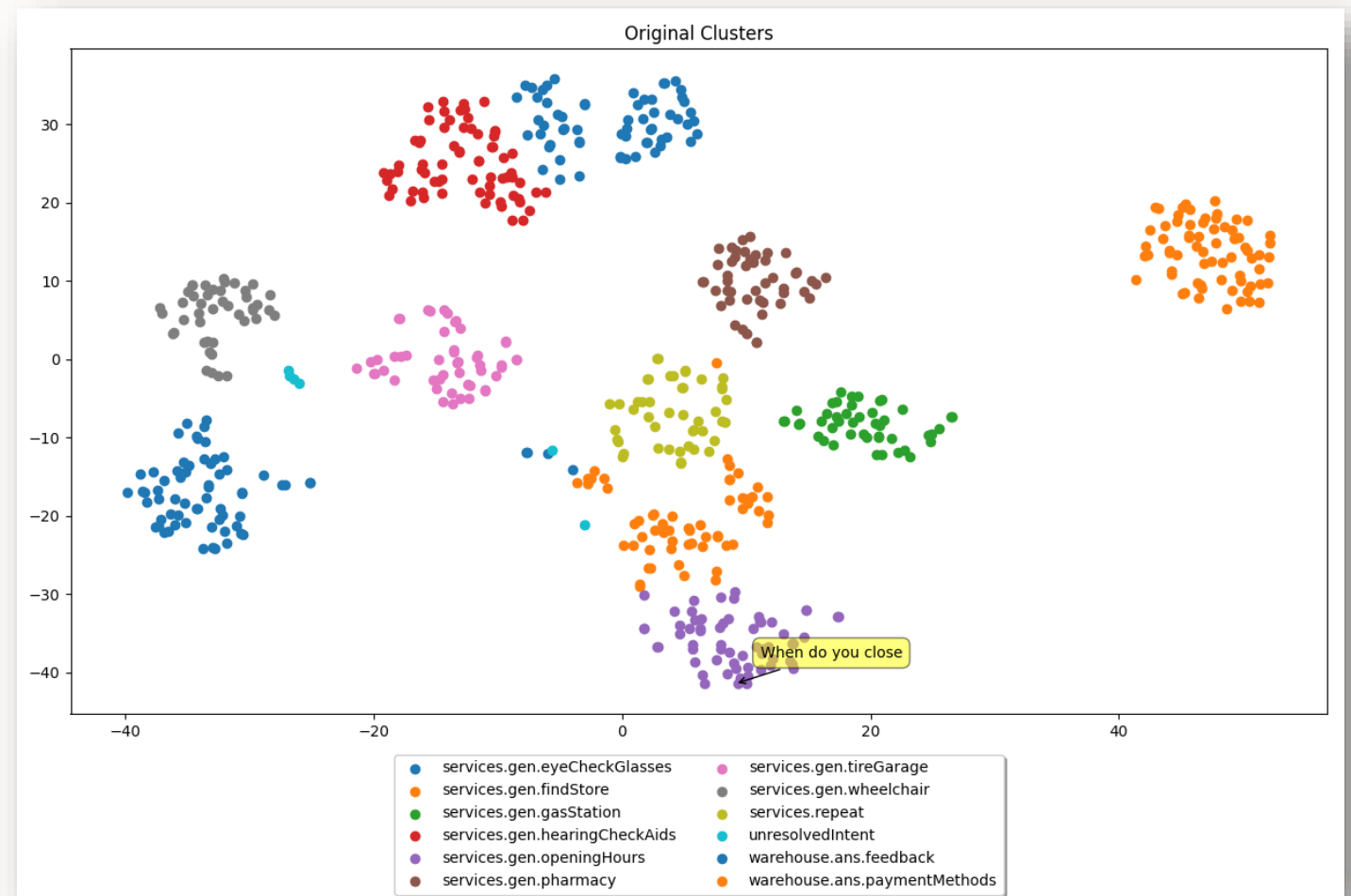
- The more generic the intent is, the more generic the NLP classification is.



# NLP is a classification task

## Real intent plotting

- This is a 2 dimension representation of all the utterances for a production Skill
- The visualization helps in understanding how well formed the model is
- This demonstrates many of the characteristics of a good model



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