

ORACLE®

Oracle Digital Assistant

The Complete Training

Entities



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Topic agenda

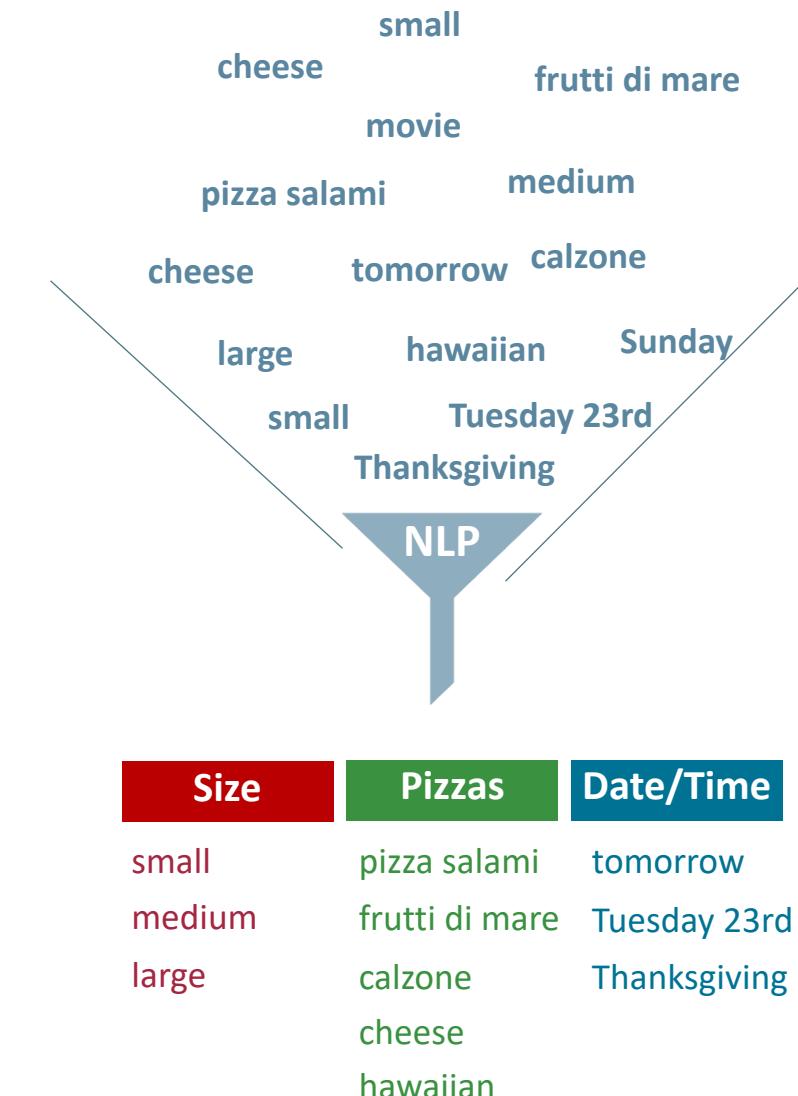
- 1 ➤ Introduction to entities
- 2 ➤ Built-in entities
- 3 ➤ Custom entities
- 4 ➤ Entity properties

Topic agenda

- 1 ➤ Introduction to entities
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- 4 ➤ Entity properties

Introduction to entities

- A variable piece of information of an intent
 - Helps add relevance to the intent
 - Associated with an intent
 - Extracted from user message through NLP
- Types
 - Regular entities
 - System entities, custom entities
 - Composite bag entities
 - Business domain objects
 - Dynamic entities
 - Data created, modified and deleted through API



Introduction to entities

- I want a small pepperoni pizza delivered today 8pm
- Can I order a large veggie pizza for Thanksgiving
- Order me a cheese pizza for 8pm and make it large

Order Pizza
Entity: Pizza Size

Small

Medium

Large

Order Pizza
Entity: Pizza Type

Cheese

Pepperoni

Veggie

Order Pizza
Entity: DATE

Introduction to entities

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- Order me a **cheese** pizza for **8pm** and make it **large**

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Entity: Pizza Size

Small

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Order Pizza
Entity: DATE

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- 1 ➤ Introduction to entities
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- 4 ➤ Entity properties

Built-in entities

- Implicitly exist
- You must add to the intent
- Only parsed for if added to intent
- Entity can resolve to many values
- Add multiple entities

The screenshot displays the Oracle Conversational AI platform interface. On the left, there's a sidebar with various icons for managing intents, entities, and other components. The main area shows a list of intents: 'OrderPizza' (selected) and 'WelcomePizza'. To the right of the intents, there's a form for editing the 'OrderPizza' intent, including fields for 'Conversation Name' (set to 'OrderPizza') and 'Name' (also set to 'OrderPizza'). Below the intent list, there's a section for 'Examples' with a placeholder text 'Enter your example utterances here.' On the far right, a sidebar titled 'Intent Entities' lists several built-in entities: ADDRESS, CURRENCY, DATE, and DURATION. Each entity has a small icon next to it.

Built-in entities

- Address
- Currency
- Date
- Duration
- Email
- Number
- Person
- Phone number
- Set
- Time
- URL
- Yes_No
- Location

Some built in entity examples

- Number

I loved the movie so much I saw it 20 times

```
{  
    "appId": "1E4BABB4-050F-4263-B99A-  
1041974E50FC",  
    "entityMatches": {  
        "NUMBER": [  
            20  
        ]  
    },  
    "intentMatches": {  
        "Negative": 3.5524978160858156,  
        "Positive": 3.896050727367401  
    },
```

Some built in entity examples

- Number

I loved the movie so much I saw it ten times

```
{  
    "appId": "1E4BABP4-050F-4263-B99A-  
1041974E50FC",  
    "entityMatches": {  
        "NUMBER": [  
            10  
        ]  
    },  
    "intentMatches": {  
        "Negative": 3.5524978160858156,  
        "Positive": 3.896050727367401  
    },
```

Some built in entity examples

- Number

I loved the movie so much the **second** time

```
{  
    "appId": "1E4BABB4-050F-4263-B99A-  
1041974E50FC",  
    "entityMatches": {  
        "NUMBER": [  
            2  
        ]  
    },  
    "intentMatches": {  
        "Negative": 3.5643956780433657,  
        "Positive": 3.922125017642975  
    },
```

Some built in entity examples

- Time

I went to the 2:30 screening and I loved the movie

```
{  
    "appId": "1E4BAB4-050F-4263-B99A-  
1041974E50FC",  
    "entityMatches": {  
        "DATE": [  
            1488249000000  
        ],  
        "TIME": [  
            {  
                "hrs": 2,  
                "mins": 30,  
                "secs": 0,  
                "entityName": "TIME"  
            }  
        ]  
    },  
}
```

Some built in entity examples

- Date

I saw the movie **yesterday** and I loved
the movie

```
{  
    "appId": "1E4BABB4-050F-4263-B99A-  
1041974E50FC",  
    "entityMatches": {  
        "DATE": [  
            1488193208798  
        ]  
    },  
    "intentMatches": {  
        "Negative": 3.637948226928711,  
        "Positive": 4.032271480560302  
    },
```

Some built in entity examples

- Date

I saw the movie on the 1st March 2017
and I loved the movie

```
{  
    "appId": "1E4BABB4-050F-4263-B99A-  
1041974E50FC",  
    "entityMatches": {  
        "DATE": [  
            1488367629720  
        ]  
    },  
    "intentMatches": {  
        "Negative": 3.6396953582763674,  
        "Positive": 4.031814193725586  
    },  
    "intentMatch": {  
        "stage-1": [  
            {  
                "entity": "DATE",  
                "value": "1st March 2017"  
            }  
        ]  
    }  
}
```

Some built in entity examples

- Duration

how much did I spend **last month**

```
{  
    "appId": "BB3445D3-3824-4903-B18F-  
DE8A67CC6618",  
    "entityMatches": {  
        "DURATION": [  
            {  
                "startDate": "Sun Jan 01 2017  
00:00:00 GMT+0000 (GMT Standard Time)",  
                "endDate": "Tue Jan 31 2017  
23:59:59 GMT+0000 (GMT Standard Time)",  
                "entityName": "DURATION"  
            }  
        ]  
    },  
    "intentMatches": {  
        "Send Money": 0,  
        "Balances": 1.6222682118415832,  
        "Track Spending": 2.97281813621521  
    }  
}
```

Some built in entity examples

- Person

i want to order a pizza for John Smith

```
[  
  {  
    "appId": "8CC6DA2B-7404-45D6-A2F5-3A98349C7FAC",  
    "botName": "GR_AutoComplete",  
    "entityMatches": {  
      "PERSON": [  
        {  
          "originalString": "John Smith",  
          "name": "john smith",  
          "entityName": "PERSON"  
        }  
      ]  
    },  
    "intentMatches": {  
      "SEARCH": [  
        {  
          "originalString": "order pizza",  
          "name": "order pizza",  
          "entityName": "INTENT"  
        }  
      ]  
    }  
  }  
]
```

Some built in entity examples

- Location

Find me a pizza place in Foster City

```
[  
  {  
    "appId": "8CC6DA2B-7404-45D6-A2F5-3A98349C7FAC",  
    "botName": "GR_AutoComplete",  
    "entityMatches": {  
      "LOCATION": [  
        {  
          "originalString": "Foster City",  
          "name": "foster city",  
          "entityName": "LOCATION"  
        }  
      ]  
    },  
    "intentMatches": {  
      " -  
    }  
  }]
```

Topic agenda

- 1 ➤ Introduction to entities
- 2 ➤ Built-in entities
- 3 ➤ Custom entities
- 4 ➤ Entity properties

Custom entities

- Domain-specific entities
 - ToAccount, PizzaSize, SpendingCategory
 - Value list
 - Derived
 - Entity list
 - Regular expression
 - Composite bag
 - Dynamic entity

The screenshot shows the Oracle Digital Assistant interface for creating a custom entity. The top navigation bar displays 'Skills • GR_CompositeBag_CODE' and 'DRAFT • 1.0'. On the left, a sidebar lists various entities: PizzaBag, NamedLocation, PizzaDough, PizzaSize (which is selected and highlighted in blue), PizzaTopping, ADDRESS, CURRENCY, DATE, DURATION, and EMAIL. The main workspace is titled 'Skills • GR_CompositeBag_CODE' and shows the configuration for the 'PizzaSize' entity. It includes fields for 'Name *' (set to 'PizzaSize'), 'Description' (empty), 'Type *' (set to 'Value list'), and a 'Value' section with three entries: 'Small' (synonyms: personal, smallest), 'Medium' (synonyms: middle), and 'Large' (synonyms: big, grande, biggest). A green '+ Entity' button is located at the top left of the workspace.

Value list custom entity

- Finite list of values known beforehand
- No need to use values in intent training data
- Synonyms can be defined for each value

▲ Description

Name *

Description

Configuration

Type *

Value list

+ Value

Value	Synonyms
Small	personal, smallest
Medium	middle
Large	big, grande, biggest

Derived custom entity

- Based on a parent entity
- But has an addition rule based on
 - Preceding phrases
 - Following phrases
- Examples
 - ToAccount, FromAccount
 - DestinationAirport,

▲ Description

Name *

Description

Configuration

Type *

Derived

Parent

Rule

Phrases

Entity list custom entity

- Based on a superset of entities
- Allows an entity to be matched based on multiple superset entities
 - Destination
 - Airport Code
 - AirportName
 - City

Description

Name *

Description

Configuration

Type *

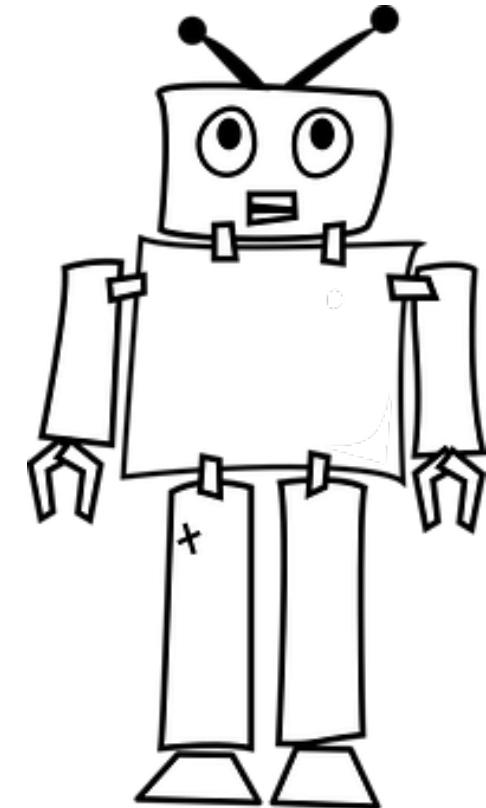
Entity list

Entities

AirportCode ✕ AirportName ✕ City ✕

Enumeration Range Size

Entities can be combined into
hierarchies to give powerful entity
resolution ability.



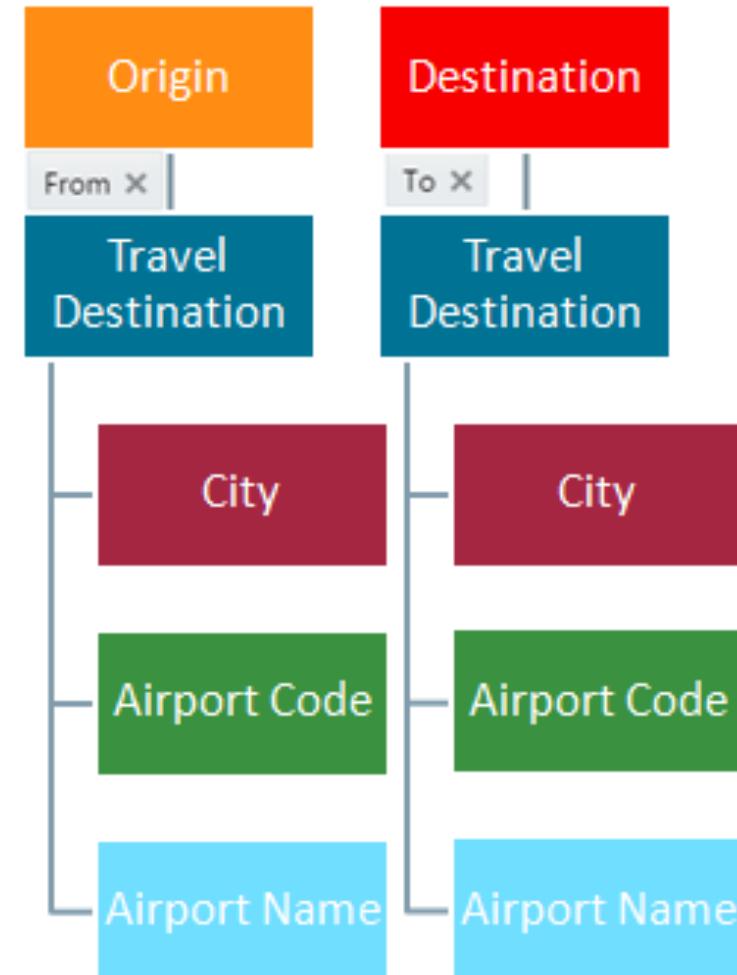
Combining hierarchies of entities

I want to book a ticket from SFO to Paris

```
{  
    "appId": "D80089BA-B75F-4D65-BDF6-  
9C67A5216695",  
    "entityMatches": {  
        "TRAVELDESTINATION": [  
            "Paris",  
            "SFO"  
        ],  
        "ORIGIN": [  
            "SFO"  
        ],  
        "CITY": [  
            "Paris"  
        ],  
        "AIRPORTCODE": [  
            "SFO"  
        ],  
        "DESTINATION": [  
            "Paris"  
        ]  
    },  
}
```

Reserve me a ticket to CDG travelling from Heathrow

```
{  
    "appId": "D80089BA-B75F-4D65-BDF6-  
9C67A5216695",  
    "entityMatches": {  
        "TRAVELDESTINATION": [  
            "Heathrow",  
            "CDG"  
        ],  
        "ORIGIN": [  
            "Heathrow"  
        ],  
        "AIRPORTNAME": [  
            "Heathrow"  
        ],  
        "AIRPORTCODE": [  
            "CDG"  
        ],  
        "DESTINATION": [  
            "CDG"  
        ]  
    },  
}
```



Regular expression custom entity

- Entity values expressed as regular expression patterns
- Common uses cases
 - Order number
 - Tax number
 - UK post code

▲ Description

Name *

Description

Configuration

Type *

Regular Expression

Regular Expression

```
([Gg][Ii][Rr] 0[Aa]{2})|(([A-Za-z][0-9]{1,2})|(([A-Za-z][A
```

Composite bag custom entity

- Models a business domain object
 - Pizza order, holiday request, expense
- Each composite bag is composed of one to many items
 - Custom entities
 - Built-in entities
 - String, location and attachment
- All contained entities resolved automatically in single dialog flow state

▲ Description

Name *
PizzaBag

Description

Configuration

Type *
Composite Bag

Bag Items

+ Bag Item

Name	Type	Entity Name
PizzaSize	ENTITY	PizzaSize
PizzaTopping	ENTITY	PizzaTopping
PizzaDough	ENTITY	PizzaDough
DeliveryTime	ENTITY	TIME
DeliveryAddress	ENTITY	ADDRESS
NamedLocation	ENTITY	NamedLocation

Dynamic custom entity

- Sometimes an entity needs to keep in step with dynamically changing data values
- Based on a value list custom entity
- Can be dynamically updated from an API
 - Add
 - Modify
 - Delete
- Typically triggered from a backend system on data change

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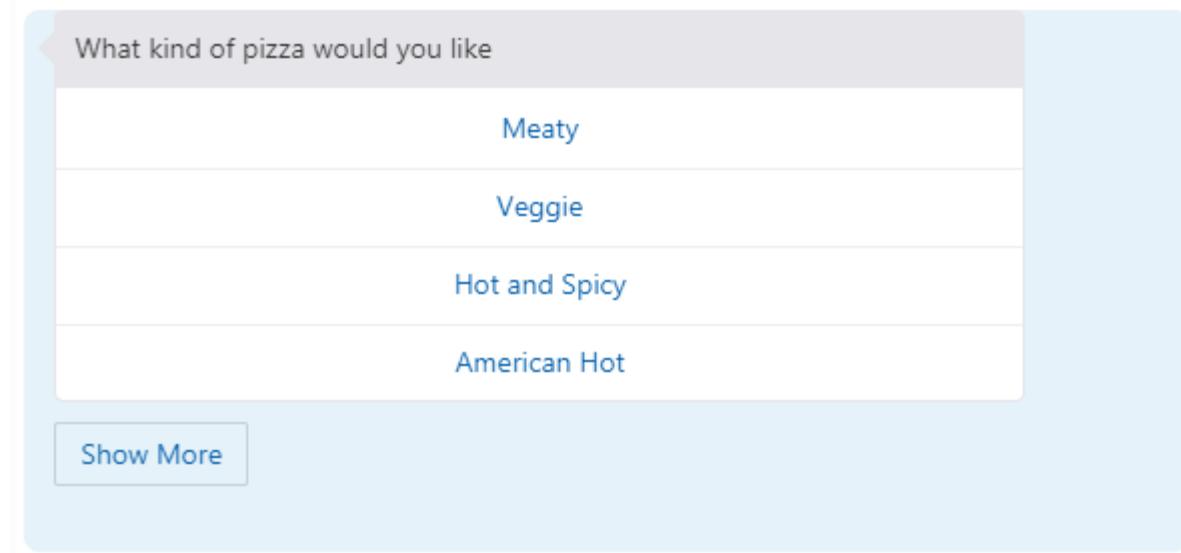
Entity properties

- Enumeration range size
- Error messages
- Multiple values
- Fuzzy match
- Prompt for disambiguation
- Disambiguation prompts
- Prompts
- Validation rules

Enumeration Range Size	
Error Message	
Multiple Values	<input type="checkbox"/>
Fuzzy Match	<input type="checkbox"/>
Disambiguation Resolution	
Prompt for Disambiguation	<input checked="" type="checkbox"/>
Disambiguation Prompt	
Prompts <small>?</small>	+ Prompt
Prompt	
Sequence Number	
Please enter AccountType	
Validation Rules	+ Validation Rule
Expression	
Error Message	
No data to display.	

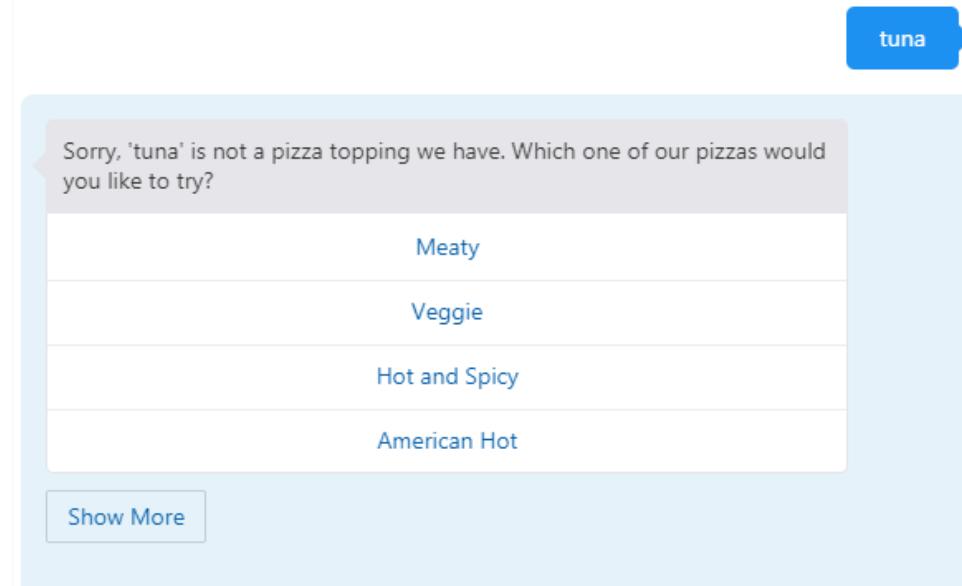
Entity properties

- Enumeration range size
 - Defines the number of entity items displayed
 - Automatically shows “Show More”



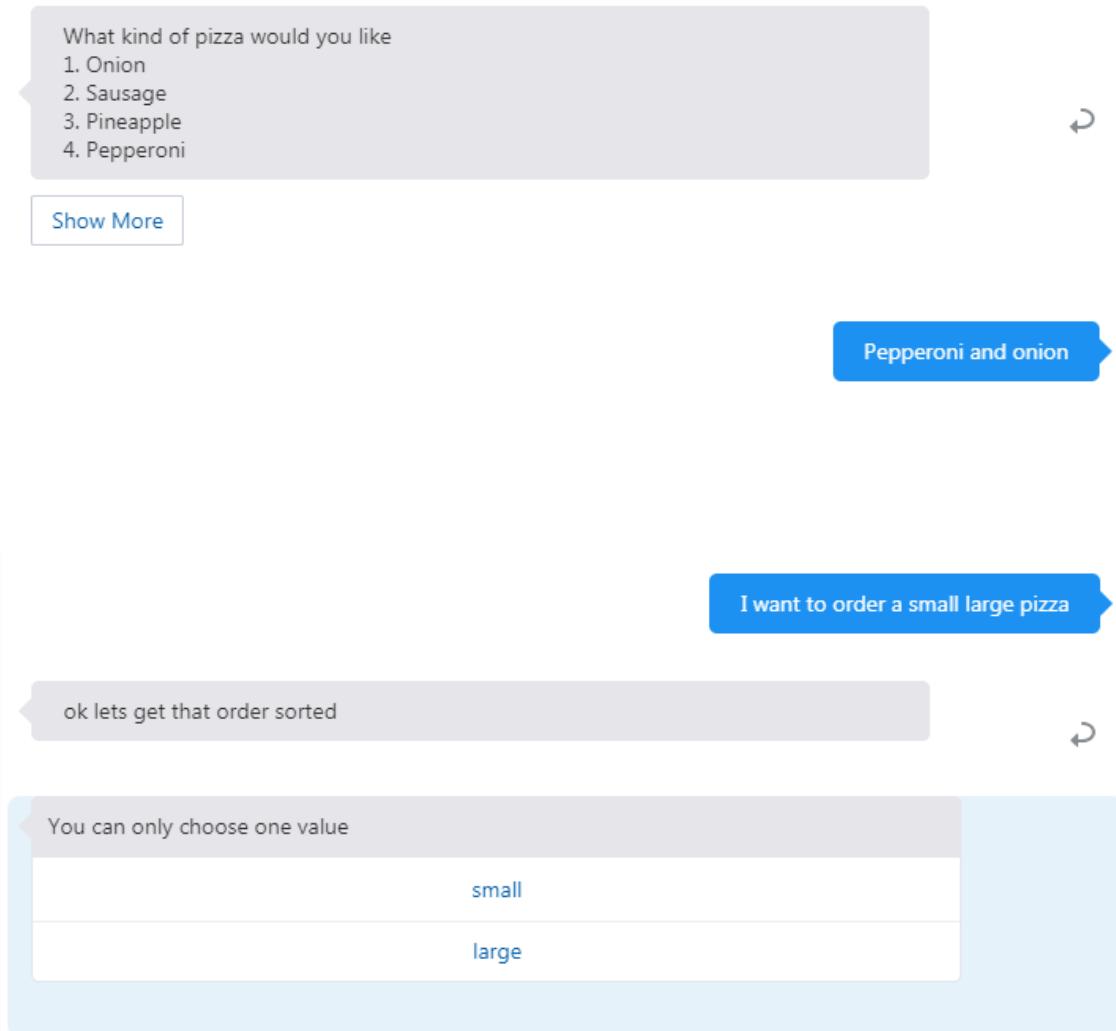
Entity properties

- Error message
 - Defines the error when an incorrect entity value is entered by the user
 - Can be dynamic
 - Sorry, '\${system.entityToResolve.value.userInput}' is not a pizza topping we have.



Entity properties

- Multiple values
 - When turned on allows the user to specify multiple values for an entity
 - When turned off the user can still specify multiple values but only the first is assigned
- Can be used in combination with Prompt for Disambiguation
 - If multiple values is set “off” but user inputs multiple values, it will prompt the user to select one value



Entity properties

- Fuzzy match
 - Allows entity values to be matched even if spelled incorrectly
 - Increases resilience on user input matching entity values



Entity properties

- Prompts
 - Defines the prompts for an entity
 - You can define sequences of prompts
 - This allows the skill to progressively disclose more information in the case of user error
 - You can also randomize the sequence by removing the sequence number

Prompt	Sequence Number
What size of pizza would you like	1
Please choose small, medium or large pizza	2
Ok, lets have one more go at this. I just need you to select a pizza size; we offer small, medium, or large.	3

Entity properties

- Validation rules
 - Defines a condition against which the entity resolution should be validated
 - Uses ApacheFreemarker expression

Validation Rules

+ Validation Rule	
Expression	Error Message
<code>\$(pizza.value.DeliveryTime.hrs?number < 10)? then('true','false')}</code>	Sorry we only deliver up to 9:30pm

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