

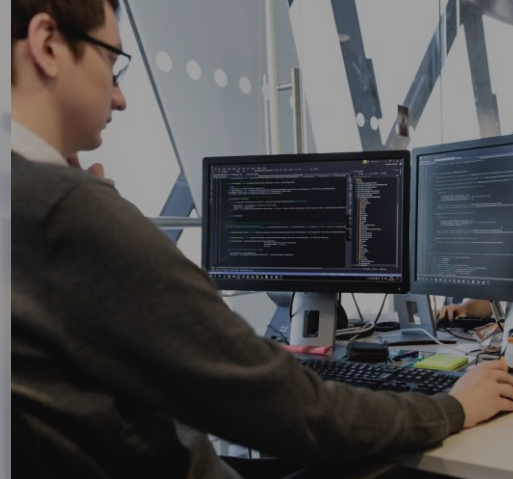


AI-100T01A: Module 04: Language Understanding with LUIS



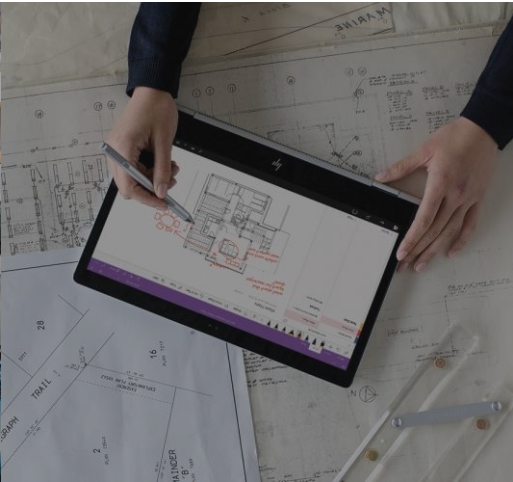
Agenda

- Introducing Language Understanding
- Create a LUIS Service
- Build Intents and Utterances in LUIS
- Lab: Implement the LUIS Model



Lesson 01

Introducing Language Understanding



Lesson Objectives

- L01 – Introduce LUIS
- L02 – Introduce Intents, Utterances, and Entities
- L03 – Understand LUIS Benefits
- L04 – Learn Best Practices for LUIS

Introduction

LUIS makes use of three key aspects for understanding language:

- **Intent**- An intent represents a task or action the user wants to perform. It is a purpose or goal expressed in a user's utterance.
- **Utterance** - Utterances are input from the user that your app needs to interpret.
- **Entities** - The entity represents a word or phrase inside the utterance that you want extracted.

Benefits of LUIS

- **Natural Language** - Designed to identify valuable information in conversations, LUIS interprets user goals (intents) and distills valuable information from sentences (entities), for a high quality, nuanced language model.
- **Integrated Learning** - Powerful developer tools are combined with customizable pre-built apps and entity dictionaries, such as Calendar, Music, and Devices, so you can build and deploy a solution more quickly.
- **Ongoing Learning** - Active learning is used to continuously improve the quality of the natural language models. Once the model starts processing input, LUIS begins active learning, allowing you to constantly update and improve the model.

Best Practices

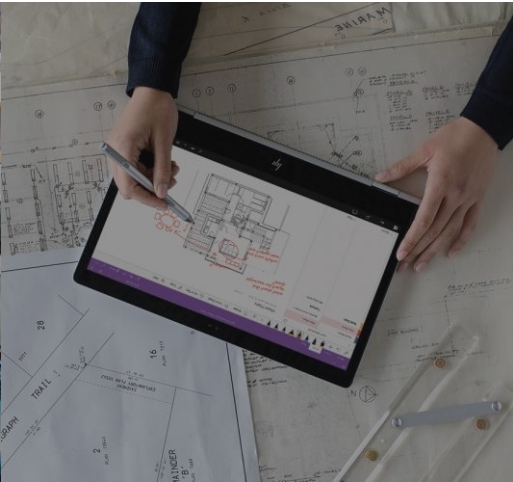
Microsoft recommends following an app authoring process as a best practice when implementing LUIS for an AI app or bot. There are five discreet steps involved in the process:

1. Build your language model
2. Add some training example utterances (10-15 per intent)
3. Publish the model
4. Test the newly published model
5. Add features as necessary based on testing



Lesson 02

Create a LUIS Service

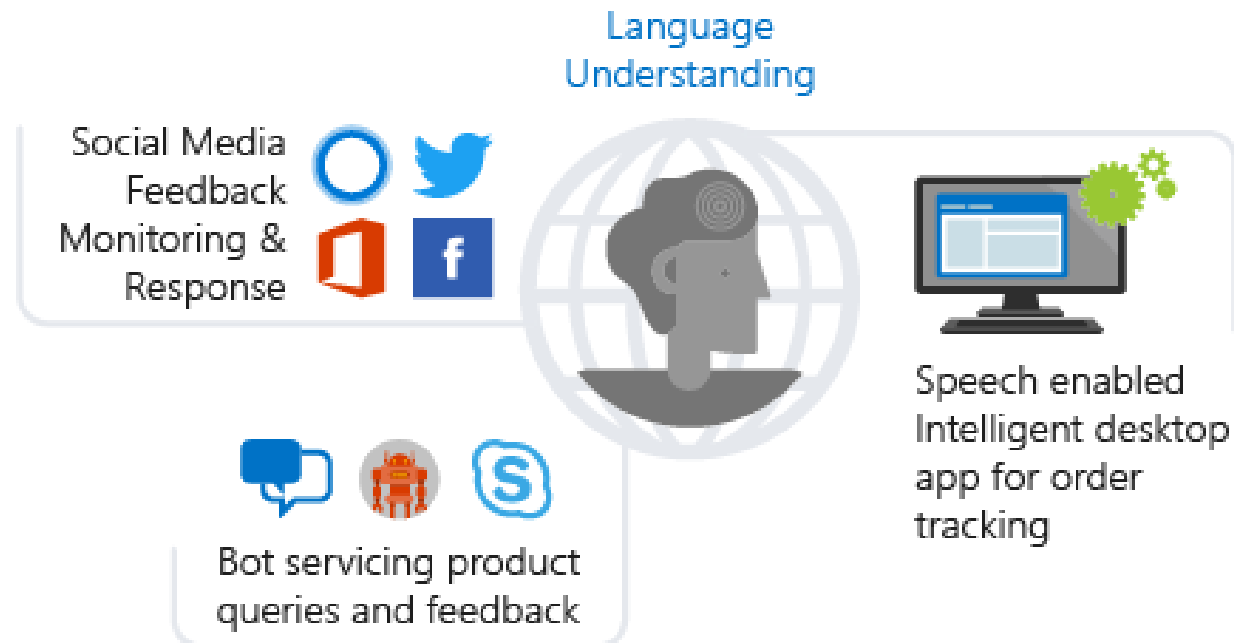


Lesson Objectives

- L01 – Understand how to Create a LUIS Service
- L02- Explore LUIS Considerations
- L03 – Guided Walkthrough, Create a LUIS Service

Introducing the LUIS Service

A cloud-based API service that applies custom machine-learning intelligence to a user's conversational, natural language text to predict overall meaning, and pull out relevant, detailed information



Considerations for LUIS

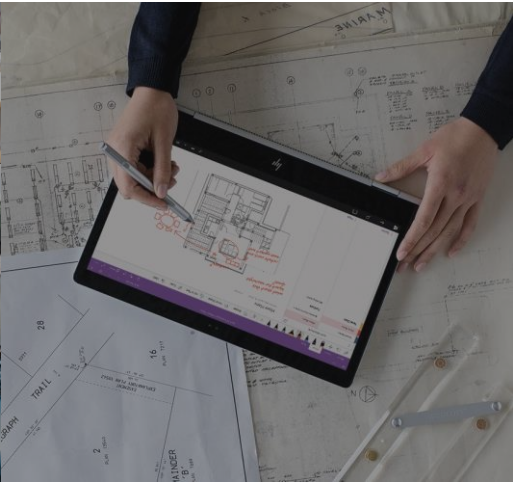
- Understand your Domain
- Plan your Intents
- Create Example Utterances for Each Intent

Walkthrough – Creating a LUIS Service



Lesson 03

Build Intents and Utterances



Lesson Objectives

- L01 – Understand Intents, Utterances, and Entities
- L02 – Guided Walkthrough, Creating Intents and Utterances

Introducing Intents

- Term used to describe the task or action that a user wants to perform
- Microsoft also provides a set of prebuilt domains that you can use as intents in your LUIS app

The screenshot shows the 'Prebuilt domains' section of the LUIS portal. On the left is a navigation sidebar with the following items: 'App Assets' (expanded), 'Intents', 'Entities', 'Improve app performance' (expanded), 'Review endpoint utterances', 'Phrase lists', and 'Patterns'. The main content area is titled 'Prebuilt domains' and features a search bar at the top. Below the search bar is a grid of domain cards. Each card includes a title, a brief description of the domain's capabilities, and an 'Add domain' button. The visible cards are: Calendar, Camera, Communication, Entertainment, Events, Fitness, Gaming, HomeAutomation, and MovieTickets. A 'PREVIEW' label is visible at the bottom of the sidebar.

Domain	Description
Calendar	The Calendar domain provides intents and entities related to calendar entries. The Calendar intents include adding, deleting or editing an appointment, checking availability, and finding information ... Learn more
Camera	The Camera domain provides intents and entities related to using a camera. The intents cover capturing a photo, selfie, screenshot or video, and broadcasting video to an application ... Learn more
Communication	The Communication domain provides intents and entities related to email, messages and phone calls ... Learn more
Entertainment	The Entertainment domain provides intents and entities related to searching for movies, music, games and TV shows ... Learn more
Events	The Events domain provides intents and entities related to booking tickets for events like concerts, festivals, sports games and comedy shows ... Learn more
Fitness	The Fitness domain provides intents and entities related to tracking fitness activities. The intents include saving notes, remaining time or distance, or saving activity results ... Learn more
Gaming	The Gaming domain provides...
HomeAutomation	The Home Automation domain...
MovieTickets	The Movie Tickets domain...

Introducing Utterances

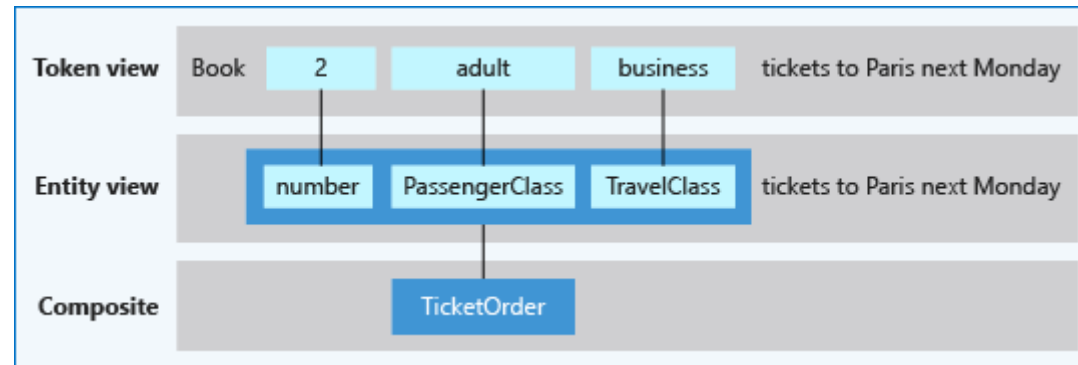
- An utterance is best explained as being a phrase or question that a user might utilize to interact with your app
 - Find outdoor pics
 - Are there pictures of a train
 - Show me beach pics
 - I want to find dog photos

Introducing Entities

- The entity represents a word or phrase inside the utterance that you want extracted.
- An utterance can include many entities or none at all. An entity represents a class including a collection of similar objects (places, things, people, events or concepts).
- Entities describe information relevant to the intent, and sometimes they are essential for your app to perform its task.

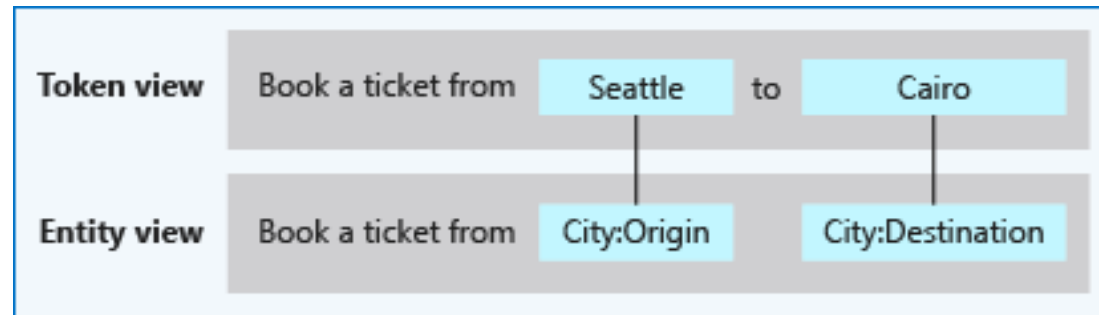
Composite Entity

- A composite entity is made up of other entities, such as prebuilt entities, simple, regular expression, list, and hierarchical entities. The separate entities form a whole entity.



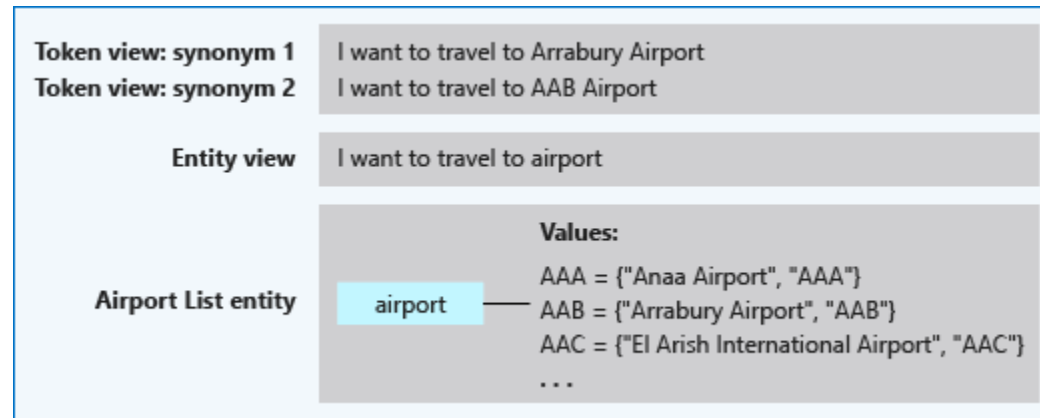
Hierarchical Entity

- A hierarchical entity is a category of contextually learned simple entities called children.



List Entity

- Fixed and closed set of related words, including synonyms.



Other Entity Types

- Pattern.any
 - Pattern.any is a variable-length placeholder used only in a pattern's template utterance to mark where the entity begins and ends.
 - **Example** Given a client application that searches for books based on title, the pattern.any extracts the complete title. A template utterance using pattern.any for this book search is Was {BookTitle} written by an American this year[?].
- Prebuilt entity
 - Prebuilt entities are built-in types that represent common concepts such as email, URL, and phone number. Prebuilt entity names are reserved. All prebuilt entities that are added to the application are returned in the endpoint prediction query if they are found in the utterance.

Other Entity Types, Cont'd

- Regular expression entity
 - A regular expression is best for raw utterance text. It ignores case and ignores cultural variant. Regular expression matching is applied after spell-check alterations at the character level, not the token level. If the regular expression is too complex, such as using many brackets, you're not able to add the expression to the model. Uses part but not all of the .Net Regex library.
- Simple entity
 - A simple entity is a generic entity that describes a single concept and is learned from the machine-learned context. Because simple entities are generally names such as company names, product names, or other categories of names, add a phrase list when using a simple entity to boost the signal of the names used.

Walkthrough – Creating Intents and Utterances

Lab 6: Implement the LUIS Model



Lab Objectives

- Create a LUIS Service
- Add Intelligence to your LUIS Service
- Train and Test the LUIS Service

Lab Scenario

- In this lab you will build the logic into a LUIS Service that helps your Bot, which will be integrated later, to search for images in the system.

Module Summary >

In this module, you have learned about:

- Language Understanding
- The Microsoft LUIS Service
- How to add Logic to a LUIS Service

Next steps >

After the course, consider exploring the scenarios and case studies on the LUIS documentation pages on Microsoft's Azure Web Site.

