

## NLU: Understanding Component

### Intent:

- Examples: list of strings

Intents should have 2 or more Training Examples and zero or more entities

### Training Examples:

- Training examples are just strings that may or may not have entities

Entities could be in-built (pre-defined) ones or words inside the training examples. In the latter case, this word should be defined and a possible list of synonyms can be provided.

**Entity:** could be a **Predefined Entity** or **Trainable Entity**

### Trainable Entity:

- examples
- may have synonyms

**Predefined Entity:** select among a predefined set of entities

**+++External Intent:** No training data: only an intent name

### Examples of NLU data

Intent: weather

- Πες μου τον καιρό
- Τι καιρό θα κάνει
- Τι καιρό θα έχει [αύριο](day)
- Θα βρέχει στην [Θεσσαλονίκη](city)

Intent: find\_doctor

- Θέλω έναν γιατρό
- Ποιος γιατρός είναι διαθέσιμος
- Είναι ο κ. [Γιώργος](name) διαθέσιμος [αύριο](day)
- Είναι ο [καρδιολόγος](specialty) διαθέσιμος [αύριο](day)
- Είναι ο <specialty> διαθέσιμος <day>

Specialty: καρδιολόγος, ...

Day: αύριο, μεθαύριο, Δευτέρα...

----- Trainable Entity Textual Example -----

Entity Specialty:

- Καρδιολόγος
- Οδοντίατρος

Intent find\_doctor:

- Είναι ο {Specialty} διαθέσιμος

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----- Predefined Entity Textual Example -----

Intent weather:

- Τι καιρό θα κάνει στην {GPE}[Thessaloniki, Athens]

----- Elsa Textual Example -----

Intent weather:

- ξεκίνα τον καιρό
- πες μου τον καιρό
- θέλω να μάθω τον καιρό
- δελτίου καιρού
- θερμοκρασία
- έχει ήλιο σήμερα
- έχει ζέστη σήμερα
- θα έχει κρύο αύριο σήμερα
- σαν να έχει συννεφιά

Intent anecdota:

- ανέκδοτο
- ανέκδοτα
- αστεία
- πες μου ένα ανέκδοτο
- πες μου κάτι αστείο
- να ευθυμίσουμε λίγο
- είπες ένα καλό τις προάλλες
- πες κανά αστείο

Intent panic\_button:

- βοήθεια
- θέλω βοήθεια
- χτύπησα
- έλσα χτύπησα
- πονάω
- α βοήθεια
- δεν νιώθω καλά
- τηλεφώνησε να έρθει ασθενοφόρο
- νοσοκομείο χρειάζομαι να πάω
- δεν νιώθω τα πόδια μου
- δεν νιώθω καλά
- δεν είμαι καλά

Synonym item:

- Γιατρος

- Γιατροι
- Γιατρος
- Επίσκεψη
- ραντεβου

Synonym date\_period:

- Μερα
- Εβδομαδα
- Μηνα
- Αυριο

Entity doctor:

- Γιώργος
- Γιάννης
- Μαρία

Intent request\_appointment:

- θελω να κλεισω μια {item} με τον {item} {doctor} σε μια {item}
- θελω να κλεισω μια {item} με τον {item} {PERSON} σε μια {item}
- θελω να προγραμματισεις ενα {item} με τον {doctor} αυτη την {item}
- θελω να κανονισω ενα {item} με τον {doctor} για {date\_period}
- θελω να κανονισω ενα {item} με τον {PERSON} για {date\_period}
- υπαρχει {item} με την {doctor} στις 9 του {date\_period}
- {item} με τον {doctor} την {DATE}

Synonym drugslist:

- Φαρμακα
- φαρμακευτικη αγωγη
- Αγωγη
- Φαρμακο
- Χάπι

Intent notification\_drugs:

- ενημερωσε με για την {drugslist}
- πες μου τι {drugslist} εχω να παρω
- τι εχω να παρω
- τι {drugslist} εχω να παρω
- εχω {drugslist} να παρω
- πες τι {drugslist} εχω
- πες τι {drugslist} μου λειπουν να παρω
- πες μου εχω {drugslist} για {DATE}
- {drugslist} {DATE}
- {drugslist} εχω

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Types of predefined entities (entities that a trained model exists and can be added to extract them as-is from sentences). There are 18 main types: PERSON, NORP, FAC, ORG, GPE, LOC, PRODUCT, EVENT, WORK\_OF\_ART, LAW, LANGUAGE, DATE, TIME, PERCENT, MONEY, QUANTITY, ORDINAL, CARDINAL.

| TYPE    | DESCRIPTION                                          | EXAMPLE                                             |
|---------|------------------------------------------------------|-----------------------------------------------------|
| PERSON  | People, including fictional.                         | <i>Fred Flintstone</i>                              |
| NORP    | Nationalities or religious or political groups.      | <i>The Republican Party</i>                         |
| FAC     | Buildings, airports, highways, bridges, etc.         | <i>Logan International Airport, The Golden Gate</i> |
| ORG     | Companies, agencies, institutions, etc.              | <i>Microsoft, FBI, MIT</i>                          |
| GPE     | Countries, cities, states.                           | <i>France, UAR, Chicago, Idaho</i>                  |
| LOC     | Non-GPE locations, mountain ranges, bodies of water. | <i>Europe, Nile River, Midwest</i>                  |
| PRODUCT | Objects, vehicles, foods, etc. (Not services.)       | <i>Formula 1</i>                                    |

|             |                                                      |                                 |
|-------------|------------------------------------------------------|---------------------------------|
| EVENT       | Named hurricanes, battles, wars, sports events, etc. | <i>Olympic Games</i>            |
| WORK_OF_ART | Titles of books, songs, etc.                         | <i>The Mona Lisa</i>            |
| LAW         | Named documents made into laws.                      | <i>Roe v. Wade</i>              |
| LANGUAGE    | Any named language.                                  | <i>English</i>                  |
| DATE        | Absolute or relative dates or periods.               | <i>20 July 1969</i>             |
| TIME        | Times smaller than a day.                            | <i>Four hours</i>               |
| PERCENT     | Percentage, including "%".                           | <i>Eighty percent</i>           |
| MONEY       | Monetary values, including unit.                     | <i>Twenty Cents</i>             |
| QUANTITY    | Measurements, as of weight or distance.              | <i>Several kilometers, 55kg</i> |
| ORDINAL     | "first", "second", etc.                              | <i>9th, Ninth</i>               |
| CARDINAL    | Numerals that do not fall under another type.        | <i>2, Two, Fifty-two</i>        |

## NLG: Response/Generation Component

### Response (BOT):

- Reply
- Action
- Form

**Reply:** one or more fixed template texts (that may have a parameter inside - 2nd implementation) for the bot to respond

### Action (intentially is Python code so anything is possible):

- Start app for Elsa
- Speak
- Call service (2nd implementation)
- Set slot with a value
- ...

A **Form** has a list of slots to be filled

Each slot should have:

- type (str, int, bool, etc)
- How the assistant should ask for it (Human-Robot Interaction)
- How to extract the slot from the given input, choices:
  - from\_text: will store the entire user expression in the slot
  - from\_entity: will store an entity the user said, such as PERSON, NUMBER, etc (I will provide us a list of the supported entities)
  - from\_intent [value]: if the user said a specific intent (e.g. affirm - yes) then set slot with *value*
  - from\_function (2nd implementation or never ?) import external function to process text
- Example expressions in cases of from\_text and from\_entity (entity marked): list of strings
- A