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Domain-specific language for analyzing medical results

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Introduction

The aim of the following presentation is to describe the way how the Medical Domain could benefit from a DSL and advantages of using DSL in medicine, such as improved accuracy, faster processing times, and reduced error rates.

Domain Analysis

Domain Analysis

Problem Description and Problem Analysis

Domain Analysis

Solution Proposal

Target Group

01 Clinical laboratory scientists

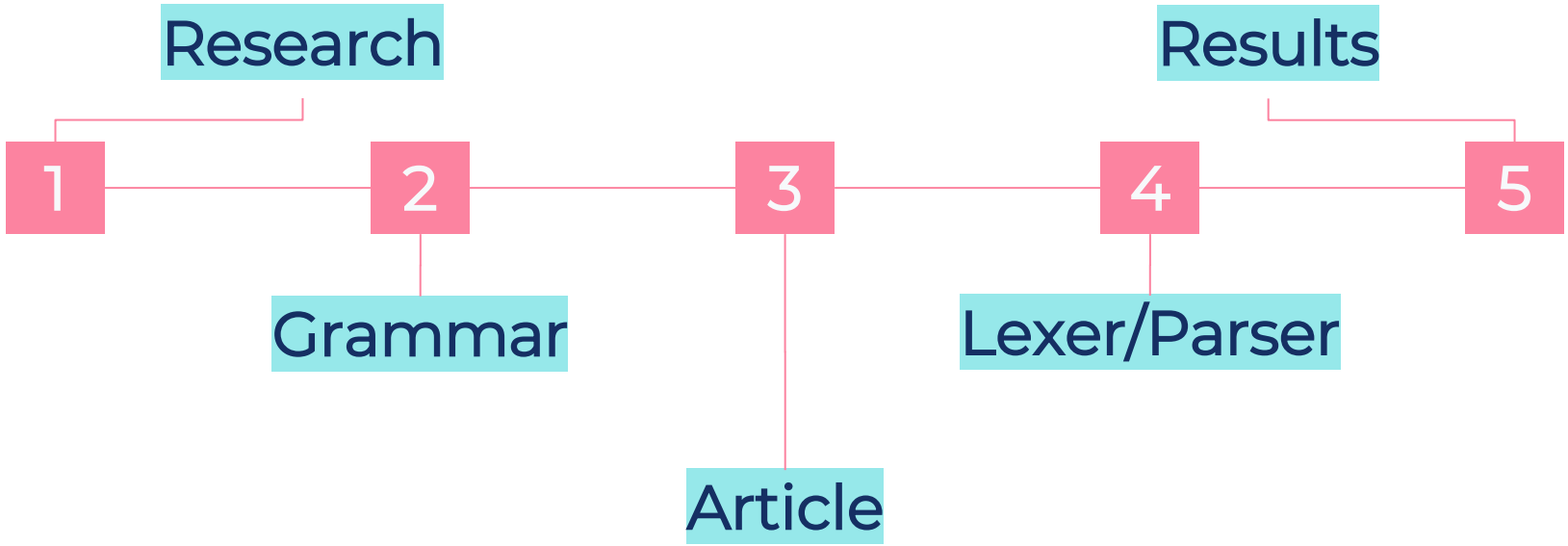
02 Nurses

03 Doctors

04 Patients

Grammar

Road Map



Grammar

The grammar is a set of rules that tells a computer how to understand and analyze medical results.
It has different parts that describe different types of results, such as tests, imaging, and lab results.

```
<medical_results> -> <test_result> | <imaging_result> | <lab_result> | <query>
<test_result> -> "test" <test_name> ":" <result> ["units" <unit>] [<reference_range>]
<imaging_result> -> "imaging" <imaging_type> ":" <result> ["units" <unit>] [<image_location>]
<lab_result> -> "lab" <lab_name> ":" <result> ["units" <unit>] [<reference_range>]
<query> -> "show" <query_type> "for" <patient_data>
<query_type> -> "all" <result_type> | "average" <result_type> "for" <time_frame>
<result_type> -> "tests" | "imaging" | "labs"
<patient_data> -> "patient" <patient_id> | "age" <birthday>
<patient_id> -> <word>+
<birthday> -> <date>
<date> -> <year> "-" <month> "-" <day>
<year> -> <number>
<month> -> <number>
<day> -> <number>
<test_name> -> <word>+
<imaging_type> -> <word>+
<lab_name> -> <word>+
<result> -> <number>
<unit> -> <word>+
<reference_range> -> "normal range" <normal_range> | "high range" <high_range> | "low range" <low_range>
<normal_range> -> <number> "-" <number> <unit>
<high_range> -> ">" <number> <unit>
<low_range> -> "<" <number> <unit>
<image_location> -> "location" <location>
<location> -> <word>
```

```
Description {
        test glucose= 120
        units= 'mg/dL'
        stage= 'normal'
        range= '70-100'
}
Setting {
        patient= 'John Smith',
        age= '1978-01-01'
        gender= 'male',
        weight= '175 lbs',
        height= '5 11'
}
Response {
        show all tests for patient age 1978-01-01
         // Output: glucose: 120 mg/dL (normal)
}
Response {
        show average labs for last 6 months for patient John Smith
         // Output: No lab results found for patient John Smith in the last 6 months.
}
Response {
        show all imaging for patient John Smith
         // Output: No imaging results found for patient John Smith.
}
Response {
        length 300
        prompt "The patient's glucose test results were higher than normal and indicate the presence of diabetes. The patient is adv
}
```

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Thank you!