A Fuzzy Arden Syntax Compiler

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Introduction

Arden Syntax

- Health Level Seven (ANSI)
- Clinical decision support

Fuzzy Arden Syntax

- first proposed by Tiffe, enhancements and mathematical background by Vetterlein

- Fuzzy Sets, Fuzzy Logic

- Fuzzy Data Types vs. Crisp Data Types
Motivation

**Calculation: UTI-C for a single patient at a specific date**

logic:

\[
\text{UTI}_C := \text{fever AND urinUrgency AND ...};
\]

conclude \text{true};

 действие:

return \text{UTI}_C;

- **Arden Syntax**
  concludes either **TRUE** or **FALSE**

- **Fuzzy Arden Syntax**
  concludes also values between 0 and 1

**Note:** Fuzzy Arden Syntax also allows “conclude \text{UTI}_C;” to execute the action slot with corresponding weighting.
If-Then-Else: Aggregate and Branching

**Source**

```plaintext
maintenance:
[...]  
knowledge:
[...]  
logic:
   //define BMI as above  
[...]  
myBMI := 19;
x := myBMI <= BMI.normal;

if x then
   <then_block>
else
   <else_block>
endif;
[...]
end:
```

**Arden Syntax**

```
x := ...

if x then
   <then_block>
   <else_block>
endif;
```

**Fuzzy Arden Syntax**

(Parallel execution)
Results

- **BNF** for Fuzzy Arden Syntax

- **compiler** and **engine** are integrated into a web-service-based server framework with standardized interoperability