Fundamentals of Artificial Intelligence and Knowledge Representation

Mod. 2

academic years 2022/2023, 2023/2024, 2024/2025: Module 2 (Chesani)
previous academic years: Module 2 (ex-Gaspari) + Module 4 (Chesani)

Prof. Federico Chesani – 15th of January, 2025

Exam B – Available time: 1h.

1) The candidate is invited to define a predicate **`slice/4`** that takes in input a list of elements and two integers **`Start`** and **`End`**, and returns the sublist of elements whose position in the input list is from the **`Start`** to the **`End`** . The first element of the list is in position 1. The element in position **`Start`** should be returned, while the element in position **`End`** should not be returned.

   The predicate should check that:
   - if **`Start`** and **`End`** are both 1, an empty list should be returned;
   - if **`End`** is equal to **`Start`**, then an empty list should be returned;
   - **`Start`** and **`End`** are greater than zero;
   - **`End`** is greater than or equal to **`Start`**.

   If these conditions are not met, the predicate should fail. For example, if invoked with a **`Start`** greater than the length of the list, the predicate should fail.

   For example, if invoked with goal:

```
% slice(In, Start, End, Result)
slice( [1,2,3,4,5,6,7,8,9], 3, 6, Result).
```

   The expected output is:

```
Yes, Result = [3,4,5]
```

2) *The candidate is invited to introduce the "vanilla" meta-interpreter, to explain the meaning of each clause, and to show how it can be modified to support a right-most selection rule of the next subgoal from the resolvent.*

3) *The candidate is invited to briefly introduce the three paradigms for representing and reasoning over systems that evolve along the temporal dimension (namely, EC, Allen Interval Logic, and LTL).*

4) *The candidate is invited to briefly introduce the concepts of Open World Assumption (OWA) and Close World Assumption (CWA), and to illustrate their use in Prolog and in Description Logic.*