

CSE 4/563 Knowledge Representation
Professor Shapiro
Homework 9
Maximum Points: 20
Due: 1:30 PM, Thursday, November 19, 2009

November 12, 2009

For this homework set, you are to submit two files:

1. A file named `hw9.prolog` containing your Prolog program. This file is to end with commented versions of the questions you ask of Prolog, surrounded by Prolog's comment brackets, `/*` and `*/`. (Not including the period.)
 2. A file named `hw9.ext` (for some appropriate *ext*) containing your name(s), your user name(s), your Prolog program, your answers to Question 2, and copies of your Prolog runs. This file can be a text file, or produced by some word processing software, but it must be formatted so it is easy to read.
1. (12) Express the following as a Prolog program.
 - (a) (2) If a category of living things is thought to be extinct at some time, it is also thought to be extinct at a later time, if an instance of that category was not seen in between.
 - (b) (2) Dodoes and ivory-billed woodpeckers are living things.
 - (c) (2) The dodo was thought to be extinct by 1681 [1].
 - (d) (2) Gene Sparling saw an ivory-billed woodpecker on February 11, 2004 [2]. Before then, it was thought to be extinct.¹ (Note that a convenient version of the ISO standard date notation to represent the dd^{th} day of the mm^{th} month of year $yyyy$ is by the integer $yyymmdd$ [4].)
 - (e) (2) Whatever background knowledge your program needs to reason about time (at the granularity level of a day), in order to answer Question 3.
 - (f) (2) Whatever additional facts your program needs to answer Question 3b correctly.
 2. (6) Give the intensional semantics of all the atomic symbols you use in your program in the following categories. Don't list atomic symbols that are part of Prolog.

Individual constants

Predicate symbols

¹By January, 2009, the ivory-billed woodpecker was again on the list of extinct birds.[3].

3. (2) Based on your program, have Prolog answer these questions:

- (a) (1) Were dodoes thought to be extinct on November 12, 2009? [yes]
- (b) (1) Were ivory-billed woodpeckers thought to be extinct on February 10, 2004? [yes]
- (c) (1) Were ivory-billed woodpeckers thought to be extinct on January 1, 2006? [no]

References

- [1] David Reilly, *The Tragedy of the Dodo*, 1999, <http://www.davidreilly.com/dodo/>.
- [2] Jay Harrod, Miyoko Chu, and Blaine Friedlander, *Ivory-billed Woodpecker Rediscovered in the Big Woods of Arkansas*, Cornell Lab of Ornithology, 2006, <http://www.birds.cornell.edu/ivory/rediscovery/>.
- [3] Bruce M. Bowman, *ABA Checklist of the Birds of North America with Taxonomy and List Updates through January 2009*, <http://www.umich.edu/~bbowman/birds/updates/>
- [4] Markus Kuhn, *A summary of the international standard date and time notation*, December 19, 2004, <http://www.cl.cam.ac.uk/~mgk25/iso-time.html>.