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Prolog week 2

Week Two of Prolog

Goal- This project's goal was two fold. First, to create a program that (building on last week's program), would check to see if a given in put was a palindrome of not. The second program was meant to gauge the validity of the familial claims made in the song “I'm my own Grandpa,” particularly the eponymous claim. Here is the exact list of claims:

The Widow's daughter is the narrator's daughter.

the Widow's daughter is the narrator's mother.

The narrator's father is the narrator's son in law.

The narrator's son is his father's wife's brother.

The narrator's baby is his own uncle.

The narrator's father's son is the widow's daughter's brother.

The narrator's father's son is the narrator's grandfather.

The narrator is the grandfather of his wife

The narrator is his own grandfather

Methods- The first program uses the functions backwards/2 and paste/3 from the week 1 project in order to complete the top level palindrome/1 function. Paste works by removing the head of the first list making it the the head of the last list. The program then recursively repeats, adding the new head of the first list to the tail of the third. Once the first list is empty, the second list is added as the tail to the third list. Backwards2 uses an accumulator to keep track of the current value, which at the end of the program will be returned. It works by placing L1 and L into the first and third arguments of paste/3.

The top level function, Palindrom/1, reads in word with read/1, converts it to a list of ascii characters with name/2, checks to see if it is spelled the same forwards and backwards with backwards/2, and then, if it succeeds, prints out the ascii list of values.

For the second task, the following list of relationship facts from the video were translated into prolog:

1. The narrator has a father
2. The narrator married a widow
3. The narrator's father married the widow's daughter
4. The narrator had a son with the widow
5. The narrator's father had a child with the widow's daughter

Several functions were developed to validate the list of claims in the song described in **Goals**. pMar/2 checks to see if Parent is the parent of Child, married to the parent of child, the parent of the spouse of Child, or married to the parent of the spouse of Child. Brother/2 uses pMar/2 to check if Sibling1 and Sibling 2 share a common parent (including through marriage). Similarly, ucleAunt/2 uses pMar/2 to and brother/2 to check if U is the brother of N's parent.

Results- The results for the first part were able to correctly identify palindromes from non palindromes. I.E. the function was able to recognize "racecar" as a palindrome, and "Hubert" as not a palindrome. For part two, the program was able to check and find all the claims previously discussed in the song to be true, including the claim that he is his own grandfather.

It should be noted, however, that because relationships are considered equivalent when marriage is calculated (i.e, a brother in law is equivalent to being a biological brother and a son is equivalent to a son in law), and that relationship do not nullify one another (i.e. one can be someone's grandfather and uncle simultaneously), many more implications can be inferred from this song. For instance, the narrator's father is also his own grandfather, as the narrator's wife is her own grandmother, simply because of the mixing of generations of the marriage.

Discussion- The analysis of familial relationships in the song for part two is incomplete. It only checks a few types of relationships and does not even account for gender and genetic vs marriage related (brother versus brother in law).

References-

Prologomania- http://www.cs.rochester.edu/~brown/173/exercises/logic/prolog/PrologHints.html

Programming in Prolog, Clocksin and Mellish, 5th Edition