A RBES for Generating Automatically Personalized Menus

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Abstract

Food bought at supermarkets in, for instance, North America or the European Union, give comprehensive information about ingredients and allergens. Meanwhile, the menus of restaurants are usually incomplete and cannot be normally completed by the waiter. This is specially important when traveling to countries with a different culture. A curious example is "calamares en su tinta" (squid in its own ink), a common dish in Spain. Its brief description would be "squid with boiled rice in its own (black) ink", but an ingredient of its sauce is flour, a fact very important for celiacs. There are constraints based on religious believes, due to food allergies or to illnesses, while others just derive from personal preferences. Another complicated situation arise in hospitals, where the doctors' nutritional recommendations have to be added to the patient's usual constraints. We have therefore designed and developed a Rule Based Expert System (RBES) that can address these problems. The rules derive directly from the recipes of the different dishes and contain the information about the required ingredients and ways of cooking. In fact, we distinguish: ingredients and ways of cooking, intermediate products (like sauces, that aren't always made explicit) and final products (the dishes listed in the menu of the restaurant). For a certain restaurant, customer and instant, the input to the RBES are: actualized stock of ingredients and personal characteristics of that customer. The RBES then prepares a "personalized menu" using set operations and knowledge extraction (thanks to an algebraic inference engine [1]). The RBES has been implemented in the computer algebra system $Maple^{TM}2015$. A first version of this work was presented at "Applications of Computer Algebra 2015" (ACA'2015) conference. The corresponding abstract is available at [2].

References

1. E. ROANES-LOZANO AND L. M. LAITA AND A. HERNANDO AND E. ROANES-MACÍAS. An Algebraic Approach to Rule Based Expert Systems. RACSAM Rev. R. Acad. Cien. Serie A. Mat. 104/1 (2010) 19-40.
2. E. ROANES-LOZANO AND J. L. GALÁN-GARCÍA AND G. AGUILERA-VENEGAS. Computer Algebra-based RBES personalized menu generator (Abstract). Available at: http://math.unm.edu/~ aca/ACA/2015/Nonstandard/RoanesLozano.pdf.