Coursework C1: XPath

For this piece of coursework you are asked to express natural language queries over documents containing recipes in XPath. On the course page you find the DTD for the recipe documents and one sample document. Of course, your queries have to work correctly over all possible documents satisfying the DTD, not only over the one sample.

You can test the queries on any of the tools shown in the lecture and the labs:

- the XPath evaluator in Eclipse

- the Kernow front end to Saxon[1]

- XMLQuire.

Note that both Eclipse and Kernow support XPath 2.0 and therefore allow you to use functions that are not available in XPath 1.0, like `avg`. Please, use only features of XPath 1.0 for your solutions.

Recipe Queries

1. How many calories are in Linguine alla Pescatora?

2. Return the titles of the recipes that have more than 500 calories.

3. Return the recipes for which at least 4 eggs are needed.

4. Which recipe has the highest number of calories? (Do not use the XPath 2.0 function `max`!)

5. How many ingredients are there in Ricotta Pie?

6. How many compound ingredients (i.e., ingredients with ingredients) are there in Ricotta Pie?

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[1]If you run more than 100 queries in Kernow, you need a password. Send me an email if you need that password.

7. How many elementary (= non-compound) ingredients are there in Ricotta Pie? (An ingredient is elementary if it does not have ingredients itself.)

8. Which recipes have an ingredient whose preparation needs more steps than are needed for the recipe itself (i.e., top level steps)?

9. What is the average number of calories per recipe? (Do not use the XQuery function `avg`!) Note: Since the "/" operator has its own meaning in XPath, the division operator is infix `div`.

10. Return the names of the ingredients of Zuppa Inglese.

11. Return the names of those ingredients of Zuppa Inglese that occur also in other recipes.

12. Which recipes have an ingredient in common with Zuppa Inglese?

13. Return the ingredients of recipes other than Zuppa Inglese that these recipes have in common with Zuppa Inglese.

14. Return the names of all elementary ingredients that occur in at least two recipes.

15. Return the titles of all recipes for which some form of egg is needed (like "egg whites" or "egg yolk").

16. Return the titles of the recipes that have only elementary ingredients.

17. Return the names of those ingredients that are mentioned in a preparation step of their recipe.

18. Return the names of ingredients that are not mentioned in a preparation step of their recipe.

Deliverable

Your deliverable will consist of

- a `.txt` file that contains for each query your formalization in XPath.

The file `recipe-queries.txt` on the website contains a numbered list of all queries. Write your answers into that file, each answer below the corresponding question.
Please, submit your work by email to `nutt AT inf.unibz.it` no later than

Wed, 14 November 2012, 23:30 hours.