Exercises

(1.1) Develop rules for the following relations and attributes: *mother, niece, female_cousin, mother_in_law, daughter_in_law, is_grandmother, has_both_parents* and implement them as Prolog programs. Experiment with different forms of queries.

(1.2) Modify the rules for *brother* and *sister* so that they only recognize *full siblings*, i.e. those that have the same (known) mother and father.

(1.3) The relation *teaching_plan* is intended to describe the teaching situation at some college. Some typical facts in this relation could be: *teaching_plan(a3,brown,english), teaching_plan(i3,miller,french)*, or *teaching_plan(i2w,myer,mathematics)*.

A second relation, *division*, describes which classes belong to which division, e.g. *division(a3,auto)*, *division(i3,info)*. Write queries with the following meanings:

(a) Does *miller* teach at the *auto* division?

(b) Who teaches *mathematics* at the *info* division.

(c) What division does *brown* teach *english* at?

(d) What subjects are taught at the *electro* division?

(e) Who teaches in more than one division?

(f) Who should take English lessons?

(1.4) Write the rule for *uncle(X,Y)* in predicate logic notation.

(1.5) Try to solve the following arithmetic puzzle given in the figure below: