1999 Paper 5 Question 7

Prolog for Artificial Intelligence

N. Wirth's textbook *Algorithms + data structures = programs* (1976) contains the following story.

> I married a widow (call her W) who has a grown-up daughter (D). My father (F), who visited us quite often, fell in love with my step-daughter and married her. Hence my father became my son-in-law and my step-daughter became my mother. Some months later, my wife gave birth to a son (S1), who became the brother-in-law of my father, as well as my uncle. The wife of my father – that is, my step-daughter – also had a son (S2).

Using Prolog, create a list of facts that represents the situation in the above story.

[5 marks]

Add rules defining the family relationships (such as father-in-law) described in the story.

[5 marks]

Show how a Prolog system would use your program to prove the goal "I am my own grandfather".

[10 marks]