

Predicate Logic Formalisation

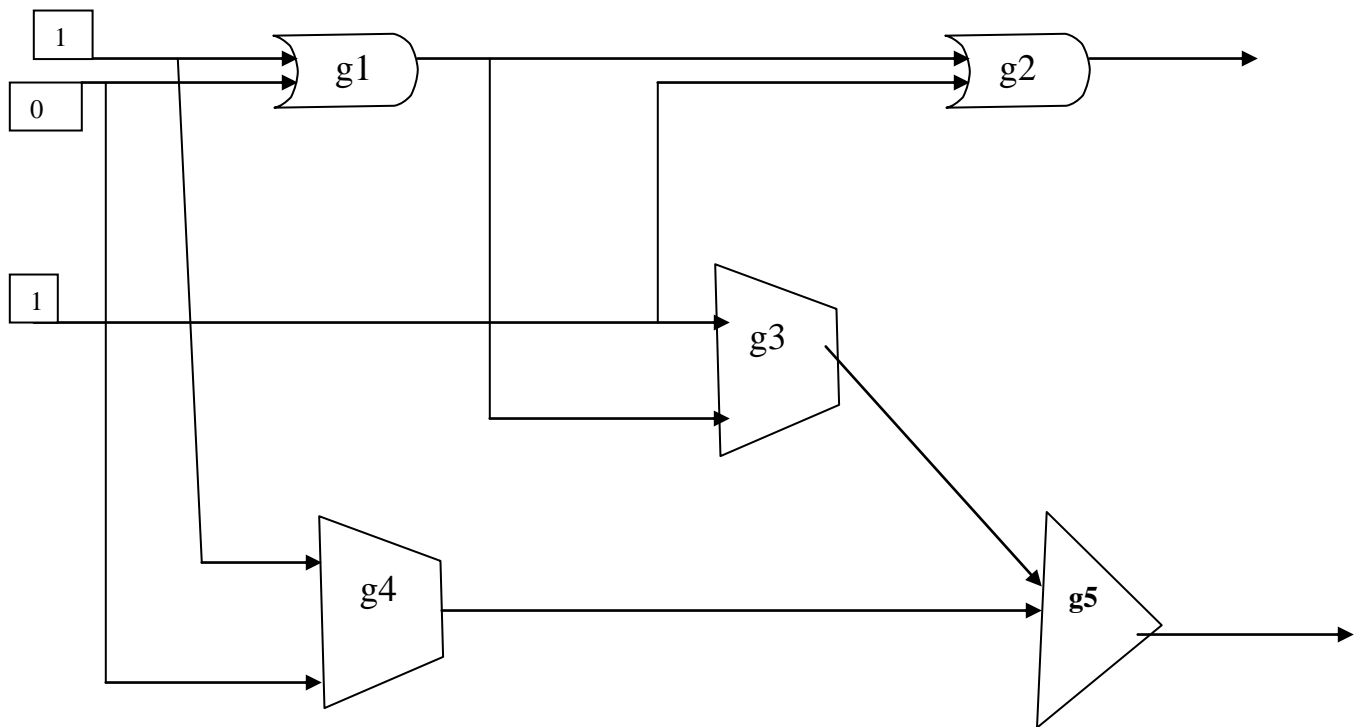
1. Assuming the following relations
term(C,T) course C is taught in term T
compulsory(C) course C is compulsory
prereq(C1,C2) course C1 is a prerequisite for course C2
lecturer(X) X is a lecturer
teaches(L,C) L teaches course C
express the following in predicate logic.
 - a. Logic is taught in term 1.
 - b. All term 1 courses are compulsory.
 - c. There is a course taught in term 2 which is compulsory.
 - d. Term 2 courses either have no prerequisites or have prerequisites that are taught in term 1.
 - e. All prerequisites of term 2 courses are taught in term 1.
 - f. Every term 1 and term 2 course has a lecturer teaching it.
 - g. There is a lecturer who teaches every term 1 and term 2 course.

2. Using the predicates:
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input1(G,I) input 1 of gate G is I
input2(G,I) input 2 of gate G is I
output(G,O) output of gate G is O
andgate(G) G is an and-gate
orgate(G) G is an or-gate
xorgate(G) G is an exclusive-or-gate
and any others you want

formalise in predicate logic, the following configuration of gates and the output of the whole system.

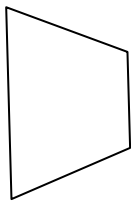
An and-gate produces 1 if both of its inputs are 1, otherwise it produces 0.
An or-gate produces 0 if both of its inputs are 0, otherwise it produces 1.
An exclusive-or-gate produces 1 if its two inputs are different, otherwise it produces 0.



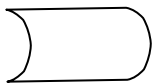
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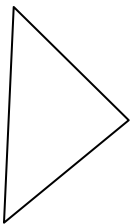
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Denotes
And-gate



Denotes
Xor-gate



Denotes
or-gate