Space Jumping Example

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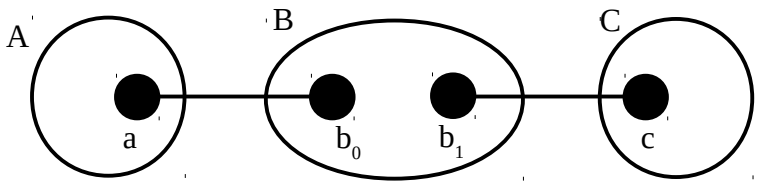
In this paper I present an example for learning Path Semantical Logic.

The Space Jumping Example is a proof in Path Semantical Logic[1]:

(a, b_0, b_1, c) (A, B, C):
a(A), b_0(B), b_1(B), c(C), a=b_0, b_1=c => A=C

Here, the tuple `(a, $b_0$, $b_1$, c)` has level 1 and the tuple `(A, B, C)` has level 0.
The notation `a(A)` means `a=>A` where `A` is at a lower level.

This can be visualized as following:



The expression `A=C` means that the spaces `A` and `C` are connected.
Notice that `a=c` is not provable, but it would be, if `$b_0$=$b_1$` is added as assumption.

The intuition is that connectivity of spaces follow a rule where for any two points within a space, one can contract them together to a single point. When any point is connected to a point inside another space, all the points inside the new space becomes contractible with any points the first space. This way, one can chain spaces together.

This technique can be generalized to any room layout, where one would like to prove whether it is possible to move from one place to another.

References:

[1] “Path Semantical Logic”
AdvancedResearch, reading sequence on Path Semantics
https://github.com/advancedresearch/path_semantics/blob/master/sequences.md#path-semantical-logic