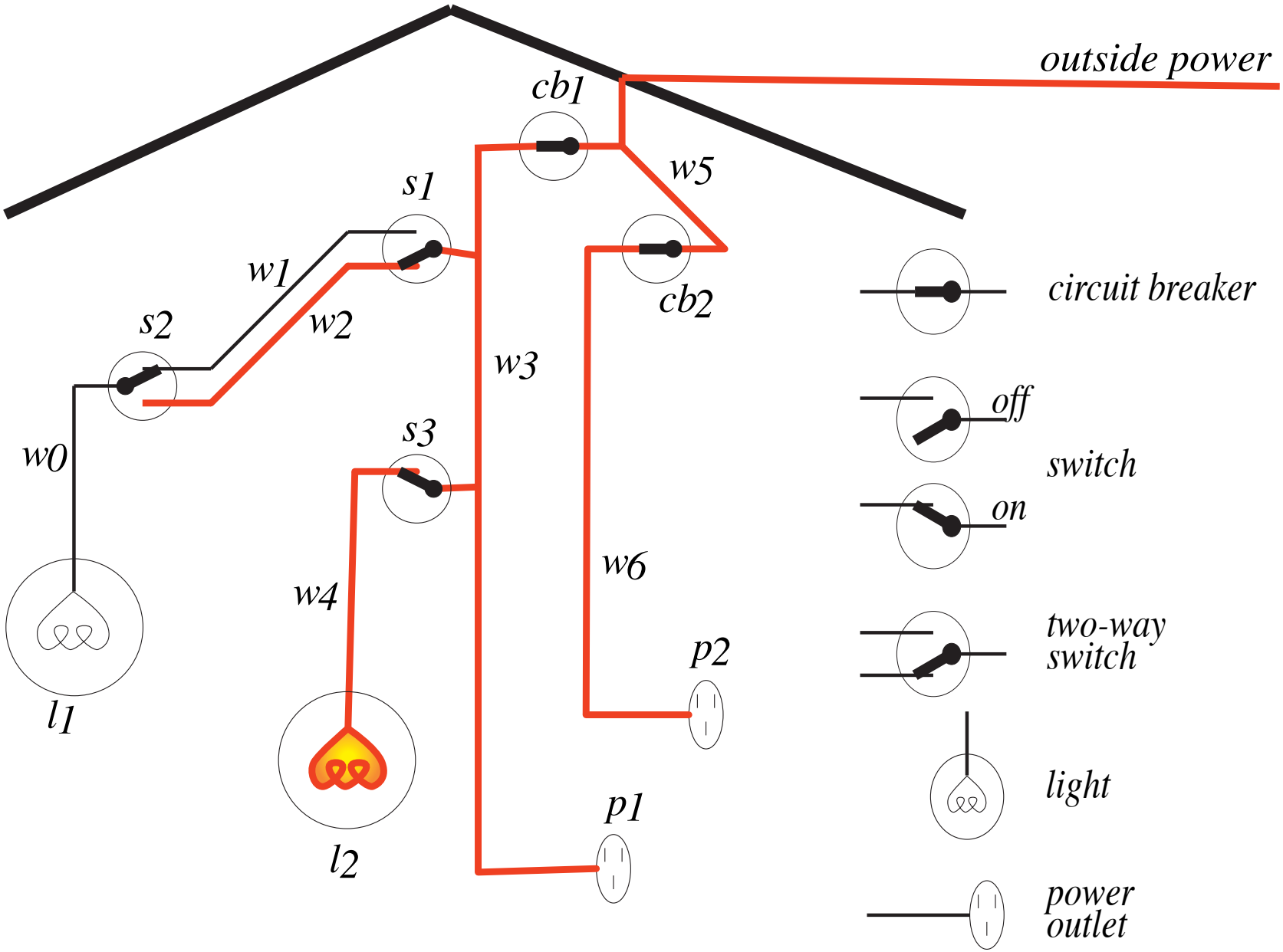
Electrical Domain



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- What should an occupant know?
- Users can't be expected to volunteer knowledge:
  - They don't know what information is needed.
  - They don't know what vocabulary to use.

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- There are 3 sorts of atoms to be proved in the top-down proof procedure:
  - how for which the user isn't expected to know the answer
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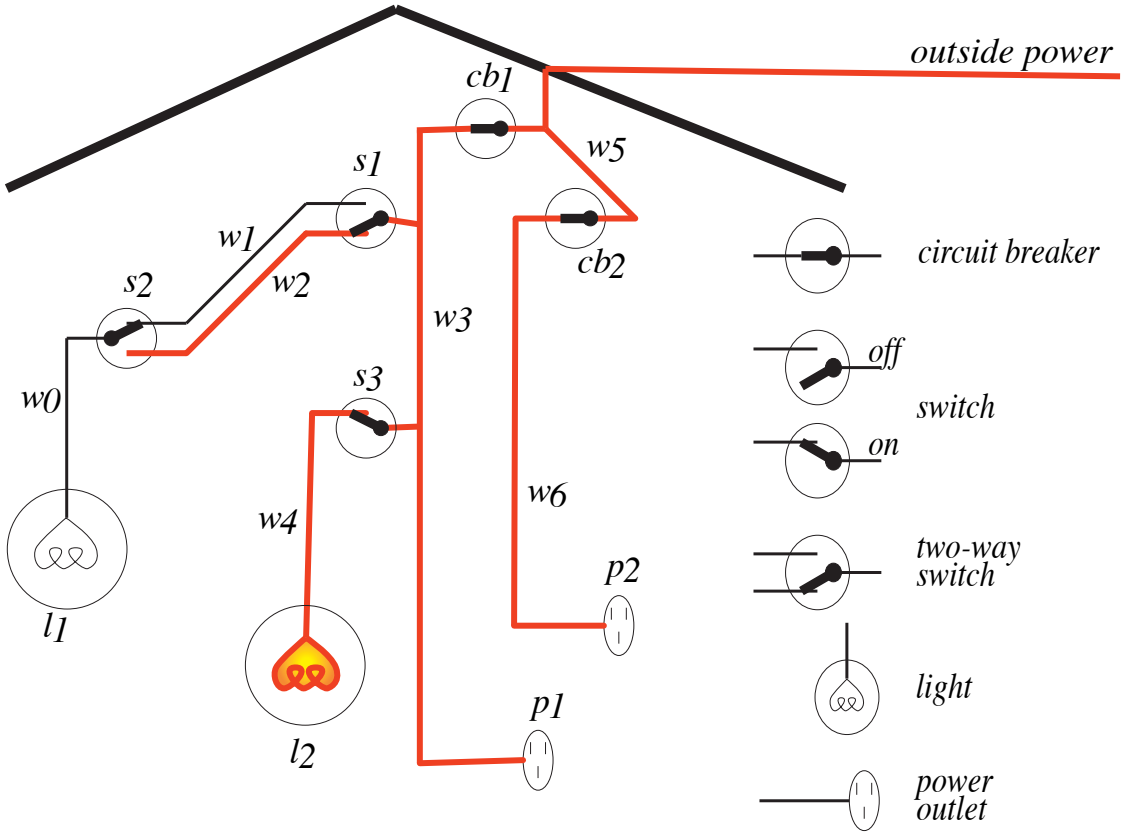
- There are 3 sorts of atoms to be proved in the top-down proof procedure:
  - how for which the user isn't expected to know the answer
  - askable atoms that may be useful in the proof
  - askable atoms that the user has already provided information about.
- The top-down proof procedure can be modified to ask users about askable atoms they have not already provided answers for.

Electrical Environment (aipython.org interaction)




```
python -i logicExplain.py
interact(elect)
ask lit_l1
```

Knowledge-Level Explanation

- HOW questions can be used to ask how an atom was proved.
  It gives the rule used to prove the atom.
  A user can ask HOW an element of the body of that rules was proved.
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  This lets the user explore a proof.
  (Continuing the aipython session):

  ```
  ask lit_l1
  how
  how 1
  ```

- WHY questions can be used to ask why a question was asked.
  It provides the rule with the asked atom in the body.
  You can ask WHY the rule in the head was asked.

Knowledge-Level Debugging

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- The program gets into an infinite loop.
- The system asks irrelevant questions.

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  - all of the a_i are true in the intended interpretation.
- Incorrect answers can be debugged by only answering yes/no questions.

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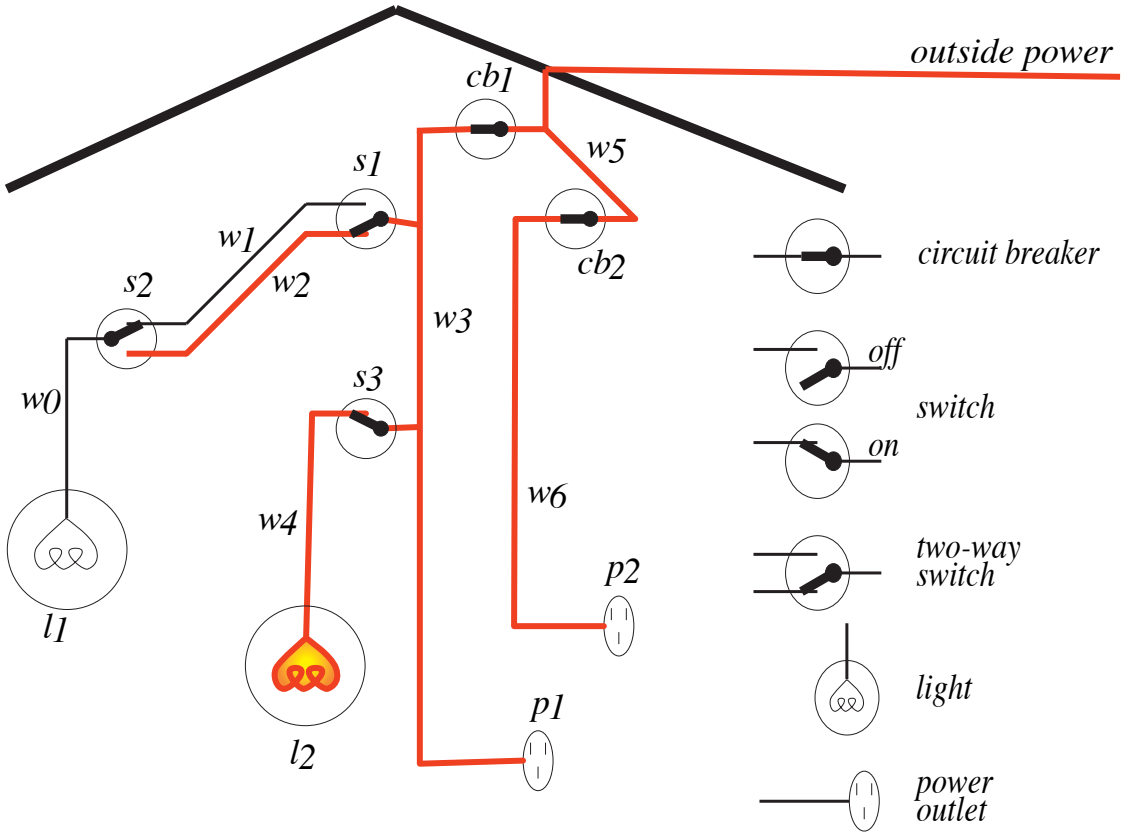


```
python -i logicExplain.py
interact(elect_bug)
ask lit_l1
how
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If atom g is true in the intended interpretation, but could not be proved, either:

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- There is a rule $g \leftarrow a_1 \wedge \ldots \wedge a_k$ that should have succeeded.
  - One of the a_i is true in the interpretation and could not be proved.