Topics:
- Translating English to Propositional Logic
- Logic Puzzles

Translating English Sentences

Steps to convert an English sentence to a statement in propositional logic:
1. Identify simple propositions and represent using propositional variables.
2. Determine appropriate logical connectives.

Examples: Translate the given statement into propositional logic using the propositions provided.

1. You cannot edit a protected Wikipedia entry unless you are an administrator.

   e = You can edit a protected Wikipedia entry.
   a = You are an administrator.

   Recall: $q$ unless $\neg p$ is a different way to express conditional $p \rightarrow q$.

   Recall: contrapositive $\neg q \rightarrow \neg p$ is logically equivalent to conditional $p \rightarrow q$.

2. (only if)
   The match is burning only if there is oxygen in the room.

   b = The match is burning.
   o = There is oxygen in the room.
3. You can access the Internet from campus only if you are a computer science major or you are not a freshman.
   a = You can access the Internet from campus.
   c = You are a computer science major.
   f = You are a freshman.

**Logic Puzzles**

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**Example:** An island has two kinds of inhabitants, *knights*, who always tell the truth, and *knaves*, who always lie.
You go to the island and meet A and B.
- A says “B is a knight.”
- B says “The two of us are of opposite types.”
What are the types are A and B?

- A says “We are both knaves.”
- B says nothing.

**Example:** When three professors are seated in a restaurant, the hostess asks them: “Does everyone want coffee?”
The first professor says: “I do not know.”
The second professor says: “I do not know.”
Finally, the third professor says: “No, not everyone wants coffee.”
The hostess comes back and gives coffee to the professors who want it. How did she figure out who wants coffee?