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**Report:** Implement Tseitin conversion

**Explanation**
The program includes three main components:

- Formula: represent a propositional logic formula
- Parser: to convert string entered by users into formula
- TseitinConversion: contains implementation for Tseitin transformation

***1. Formula***
This represents a propositional logic. There are 6 types of formula (corresponding to 5 classes defined in the program)

- Variable: it just has a *name*
- Negation: represents NOT (!) in propositional logic
- Conjunction: represents AND (^) in propositional logic
- Disjunction: represents OR in proposition logic
- Implication: represents IMPLY (=>) expression in propositional logic
- Equivalence: represents EQUIVALENCE (<=>)

Using above formula, we can express any propositional logic. Here are some examples of how to express propositional logic in Ruby code (with necessary classes have been defined):

*Example 1: (A & B) => C*

```
a = Variable.new('A')
b = Variable.new('B')
c = Variable.new('C')
Implication.new(Conjunction.new([a, b]), Variable.new(c))
```

*Example 2: (A & B) | (A => B)*

```
a = Variable.new('A')
b = Variable.new('B')
Disjunction.new([Conjunction.new([a, b]), Implication.new(a, b)])
```

***2. Parser***
Before running Tseitin conversion, we need to analyze input string and turn it into formulas. To keep it simple, following characters are used to represent logic connectives:

& : And
| : Or
-> : Imply
! : Not

Here are some examples of valid expressions
((A & B) | (C & D)) -> (!A | B)
(A | B) & C
(A | B | C) -> A

***3. TseitinConversion***
Each input expression will be considered as a big formula, and each formua is a tree which has subtrees or leaves. All leaf nodes will be Variable.

You should avoid using letter *a* as variable in the input string because by default, Tseitin conversion will generate new variable with prefix *a*. It is recommended to use only capital letters for input string.

**How to run the program**
** Development environment*
*+ Mac OSX Yosemite*
*+ Ruby 2.2.0*

The program is implemented in Ruby (version: 2.2.0). If Ruby has been installed on the system, run the following command at the source code folder:

```
ruby tseitin.rb <INPUT_FILE>
```

Example: `ruby tseitin.rb test.txt`

Please specify the propositional logic expression in the input file. Result file will be generated after finishing the conversion.