Compile program:

javac Solution.java

Run program:

Java Solution

Give well-formed formula:

When the program starts, it will allow the user to enter a formula. Instructions are in Figure 1.

```
Programming Assignment * Course: CS5303 - Logical Foundations of Computer Science
Instructions: Please enter a propositional formula
Atom: Letter from the roman alphabet A = {a,...,z}
Negation: not (p) is represented using !p
Conjunction: p and q is represented using (p&q)
Disjunction: p or q is represented using (p|q)
Implication: p implies q is represented using (p->q)
Note: Parentheses are allowed
Your formula:
```

Figure 1 Entering a formula

Transform formula to CNF, DNF, Full CNF, or Full DNF:

After entering a formula, the program will display a menu that will enable the user to obtain a logically equivalent formula in CNF, DNF, Full CNF, and Full DNF in options 1, 2, 3, and 4 respectively. Instructions are in Figure 2

```
Programming Assignment * Course: CS5303 - Logical Foundations of Computer Science
Menu:
1 Transform to CNF
2 Transform to DNF
3 Transform to Full CNF
4 Transform to Full DNF
5 Evaluate formula given truth values of the atoms
6 Decide if formula is satisfiable, a tautology, or a contradiction
7 Change formula
8 Test if knowledge base supports conclusion
9 Exit
```

Figure 2 Menu to obtain logical equivalencies of a given formula

Evaluate formula given truth values of atoms:

The program will allow the user to specify truth values of atoms in option 5.

Decide if formula is satisfiable, a tautology, or a contradiction:

The program will inform the user if the given formula is satisfiable, a tautology, or a contradiction in option 6.

Change formula:

The program will allow to change the formula in option 7.

Test if a knowledge base supports a conclusion:

User will be able to test if a knowledge base supports a conclusion in option 8.

1. The conclusion will be required first.
2. Number of formulas contained in knowledge base will be required.
3. Formulas in knowledge base will be required.
4. The program will inform the user of the result.

Terminate program:

The program will stop in option 9.