CFL2 - Solution Sketches

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We sketch here the solutions for the exercises of lecture CFL3 in a brief manner. Note that a proper solution would require more detailed descriptions, explanations, and in some cases examples. Some of the exercises may have more than one solution, and we just show one of them.

Exercise 3.1.(a) A possible set of classes for storing Boolean expressions is sketched below:

```
public abstract class BoolExpr {};
public class TrueExpr extends BoolExpr {
    public TrueExpr(void) {};
}
public class OrExpr extends BoolExpr {
    private BoolExpr lhs;
    private BoolExpr rhs;
    public OrExpr(OrExpr x, OrExpr y) {
        lhs = x;
        rhs = y;
    }
}
public class NotExpr extends BoolExpr {
    private BoolExpr b;
    public NotExpr(BoolExpr x) {
        b = x;
    }
}
```

The expression `not ( true or true )` would be represented by the object:

```
BoolExpr b = new NotExpr(new OrExpr(new TrueExpr(),new TrueExpr()));
```

Exercise 3.1.(a) A functional datatype for Boolean expressions could look like this

```
type B = True
       | Or of (B * B)
       | Not of B
```

The expression `not ( true or true )` would be represented by the functional expression as follows

```
Not(Or(True,True))
```