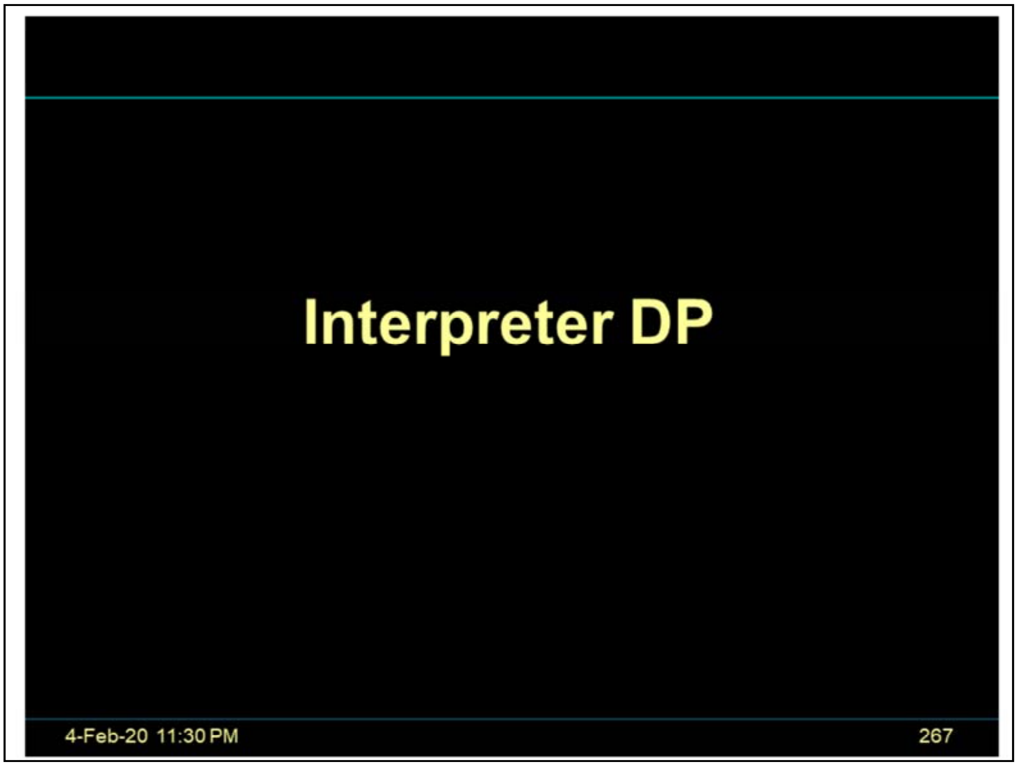

Interpreter DP

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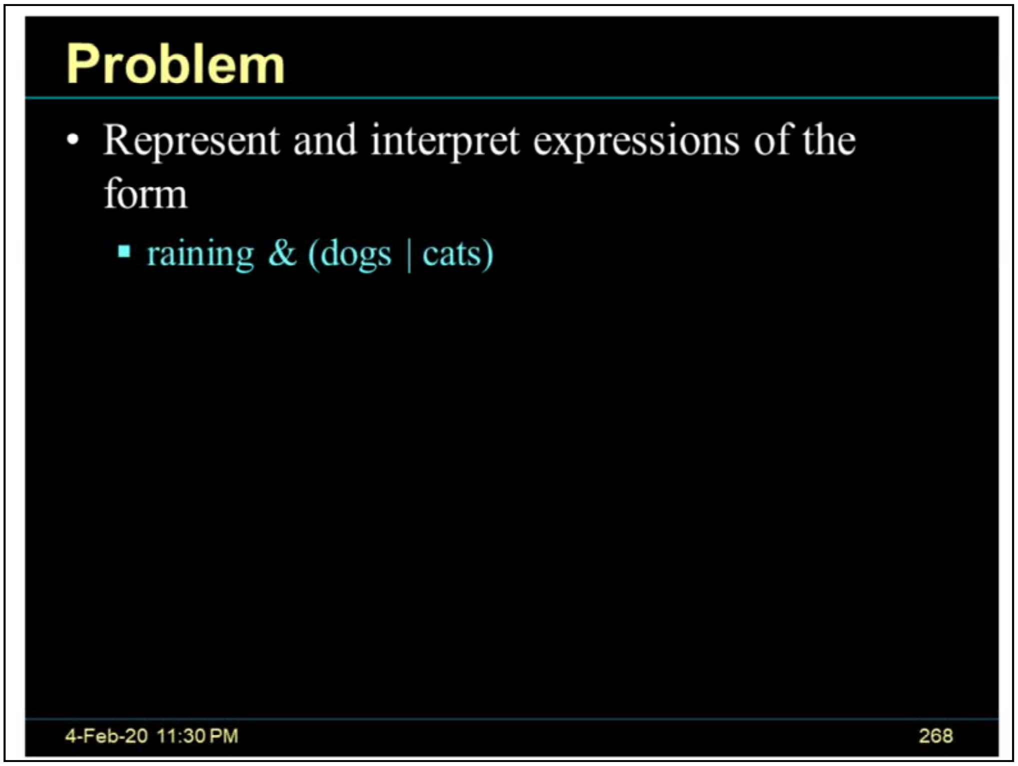
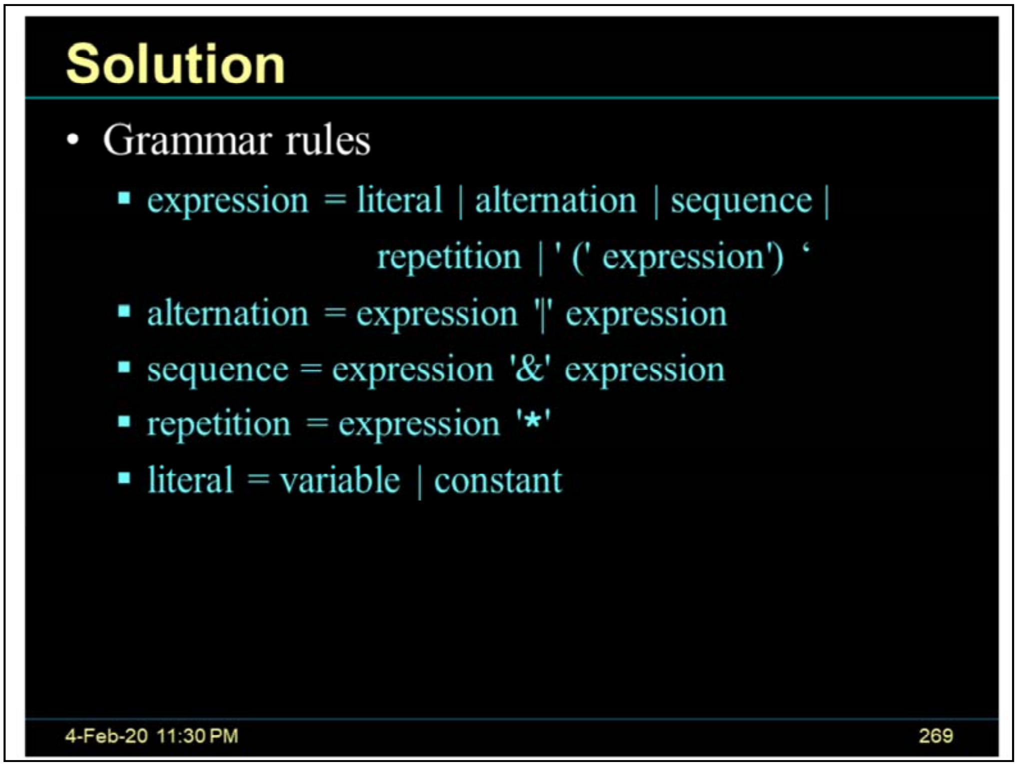


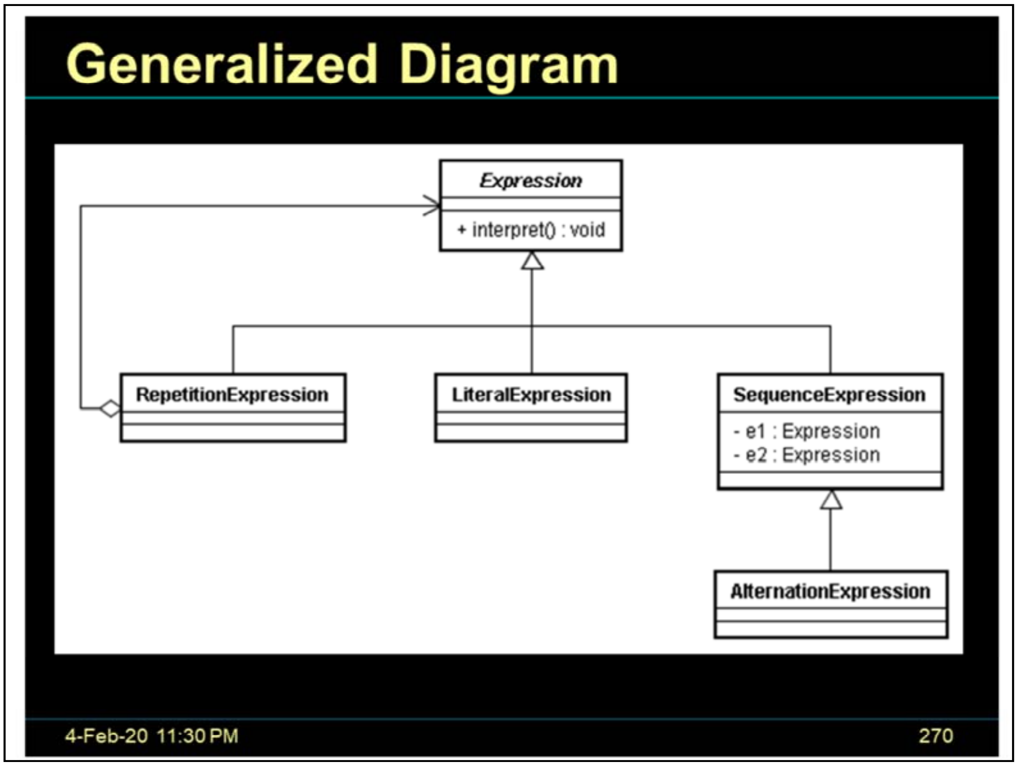
Problem

- Represent and interpret expressions of the form
  - raining & (dogs | cats)



Solution

- Grammar rules
  - expression = literal | alternation | sequence | repetition | ' (' expression') ‘
  - alternation = expression '|' expression
  - sequence = expression '&' expression
  - repetition = expression '*'
  - literal = variable | constant



Generalized Diagram

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The interpreter DP allows us to create a scripting language.

Sometimes the end users of our application need to do some kind of simple programming.

Here, we create and embed a language interpreter into our program.

Programs must parse an algebraic string.

It is widely used in compilers and like.

A Program must produce varying kinds of output. e.g.

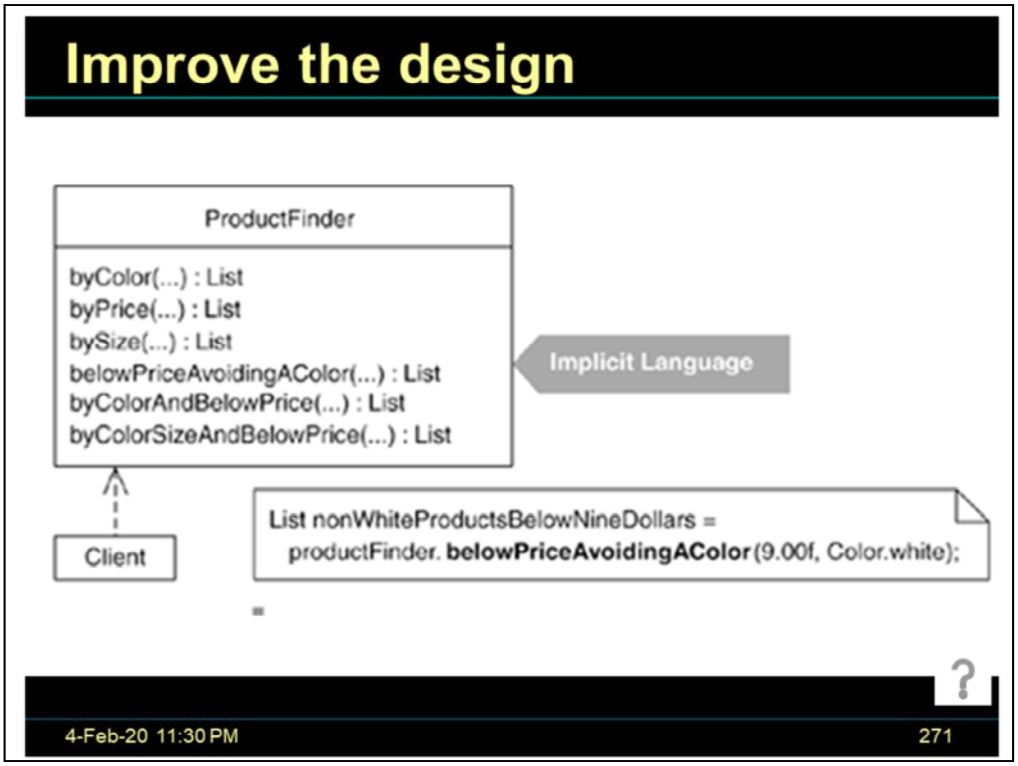
Report generators: A simple report language is entered by the user (not programmer) at runtime. This language statements are interpreted and translated into SQL statements.

Subclasses of java.text.Format use this pattern.

The constructors of these classes are passed, explicitly or implicitly, a string that contains a pattern.

Each subclass has its own little language for such things as substituting text in messages (MessageFormat), formatting date and time information (DateFormat), and formatting decimal numbers (DecimalFormat).

Because of the flat structure of these little languages, their parsers do not generate a parse tree but rather an array of objects.



Improve the design

ProductFinder
byColor(...) : List
byPrice(...) : List
bySize(...) : List
belowPriceAvoidingAColor(...) : List
byColorAndBelowPrice(...) : List
byColorSizeAndBelowPrice(...) : List
Implicit Language
Client

```
List nonWhiteProductsBelowNineDollars =
  productFinder. belowPriceAvoidingAColor(9.00f, Color.white);
```

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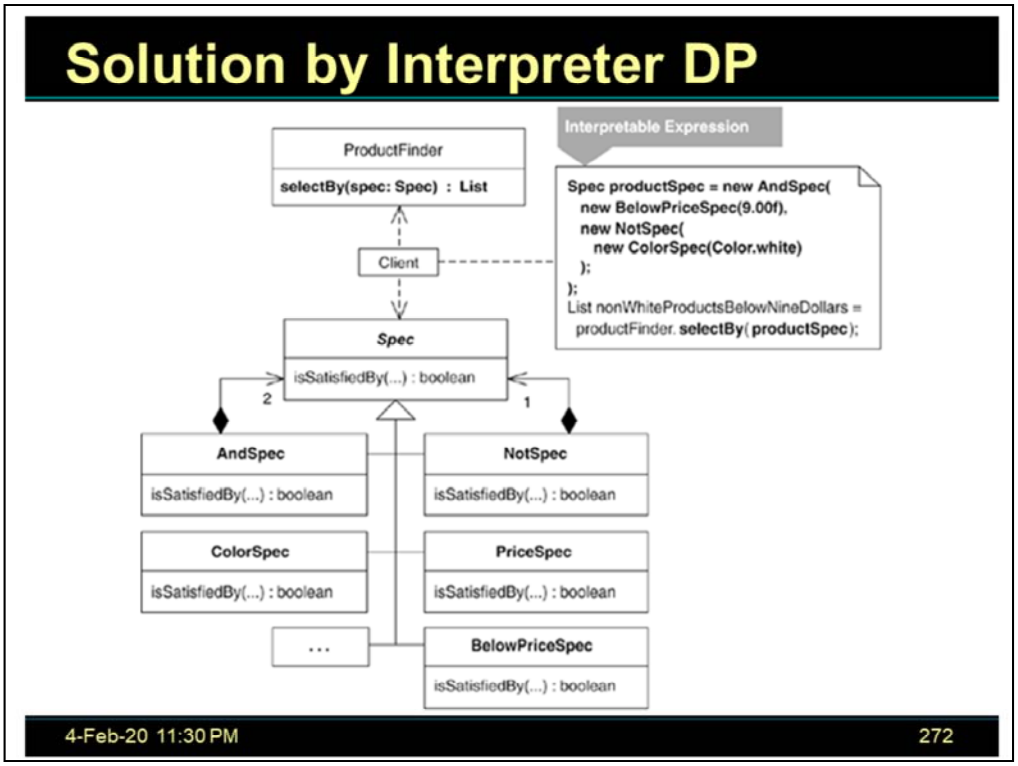

Solution by Interpreter DP

ProductFinder
selectBy(spec: Spec) : List
Client
Spec
isSatisfiedBy(...) : boolean
2
1
AndSpec
isSatisfiedBy(...) : boolean
NotSpec
isSatisfiedBy(...) : boolean
ColorSpec
isSatisfiedBy(...) : boolean
PriceSpec
isSatisfiedBy(...) : boolean
...
BelowPriceSpec
isSatisfiedBy(...) : boolean
Interpretable Expression

```
Spec productSpec = new AndSpec(
  new BelowPriceSpec(9.00f),
  new NotSpec(
    new ColorSpec(Color.white)
  );
);
List nonWhiteProductsBelowNineDollars =
  productFinder. selectBy( productSpec);
```

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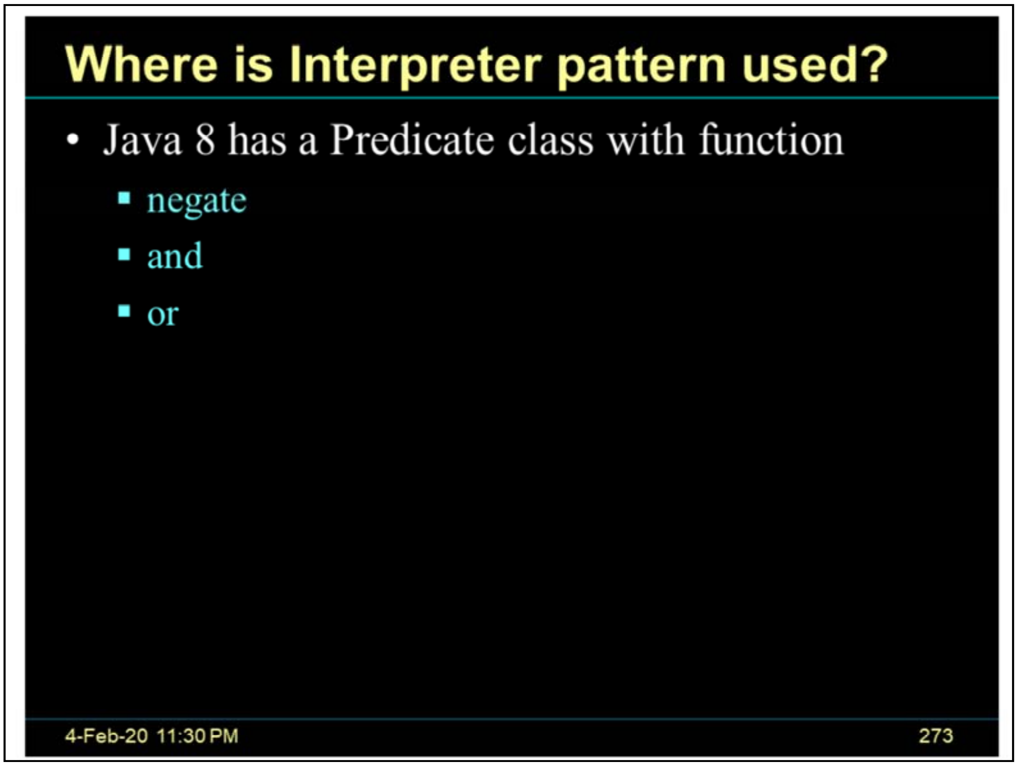
Composite DP is also used



Where is Interpreter pattern used?

- Java 8 has a Predicate class with function
  - negate
  - and
  - or