Program Optimization Problem: Summary



Example Compiler 2: Mapping Data

Attribute-to-Table Mapping

	SINGLE-VALUED	Multi-Valued
Primitive-Typed	column in <i>class table</i>	collection table
REFERENCE-TYPED	association table	
Example Transformation		

class A { attributes

s: string

bs: **set**(B . a) [*] }

class B {
 attributes
 is: set (int)

a: A . bs }

Example Compiler 2: Data Model



Example Compiler 2: Source Program



Example Compiler 2: Target Program



Example Compiler 2: Path Transformation



Program Translation Problem: Summary



Past Compiler Project: Program Verification



Past Compiler Project: Measuring Quality of Testing



Scanner in Context



Scanner: Formulation & Implementation



Formulating Strings

Set of Strings of Length k

Set of Nonempty Strings

Set of Strings of All Possible Lengths





RE Construction: Exercise

Given a language L,

derive the following languages constructed from REs:

RE Specification: Exercise

Write a regular expression for the following language

```
\{ w \mid w \text{ has alternating } 0' \text{ s and } 1' \text{ s} \}
```

RE: Operator **Precedence**

10* vs. (10)*

Are RE₁ and RE₂ equivalent?
A string in L(RE₁) but <u>not</u> in L(RE₂)?

- A string in L(RE₂) but <u>not</u> in L(RE₁)?

01* + 1 vs. 0(1* + 1)

0 + 1* vs. (0 + 1)*

DFA: Exercise

Draw the transition diagram of a DFA which accepts/recognizes the following language:

 $\{ w \mid w \neq \varepsilon \land w \text{ has equal } \# \text{ of alternating 0's and 1's } \}$

Past Compiler Project: Program Verification



Past Compiler Project: Measuring Quality of Testing

