

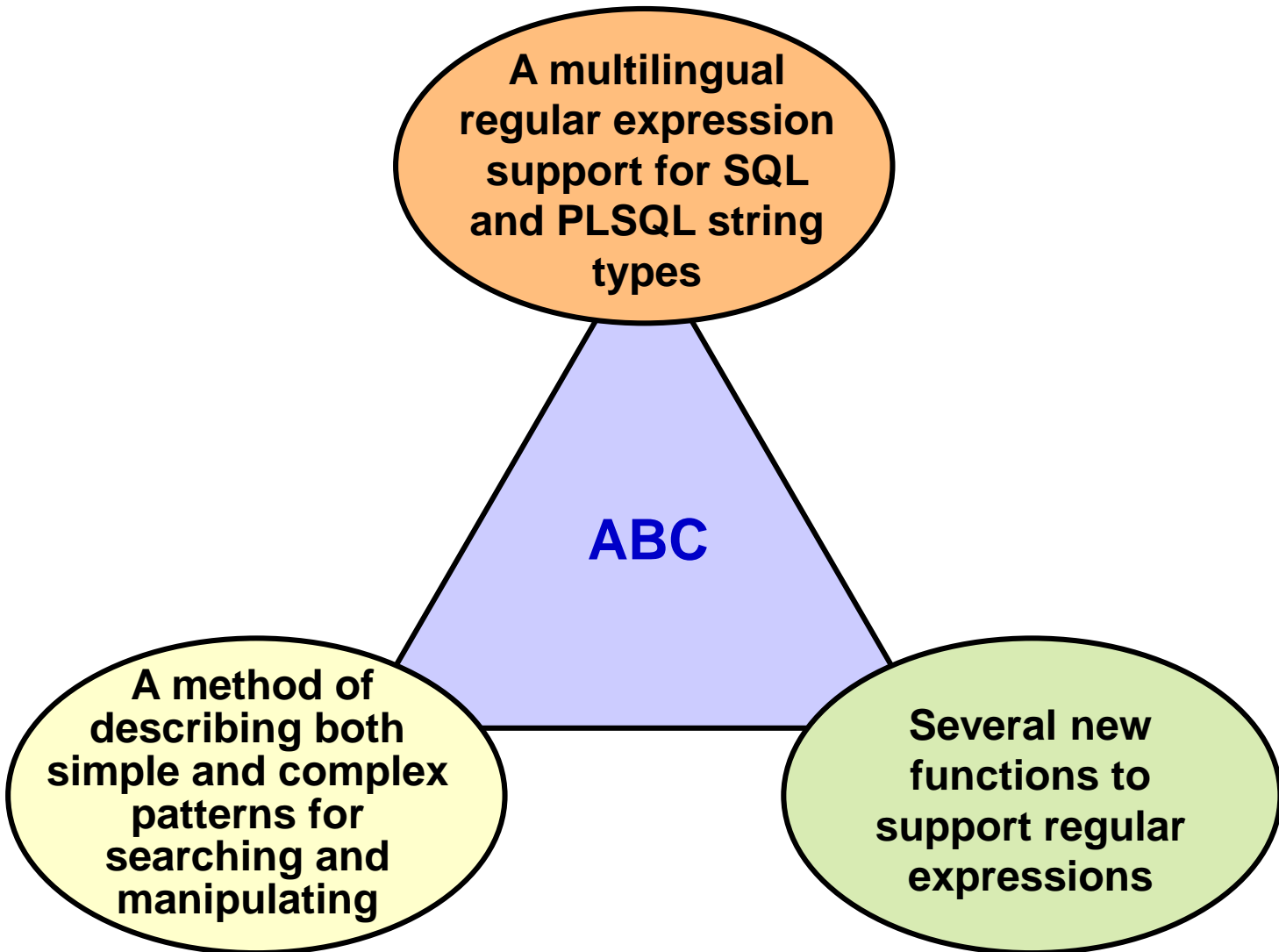
Regular Expression Support

Objectives

After completing this lesson, you should be able to use regular expression support in SQL to search, match, and replace strings all in terms of regular expressions.



Regular Expression Overview



Meta Characters

Symbol	Description
*	Matches zero or more occurrences
	Alteration operator for specifying alternative matches
^/\$	Matches the start-of-line/end-of-line
[]	Bracket expression for a matching list matching any one of the expressions represented in the list
{m}	Matches exactly <i>m</i> times
{m,n}	Matches at least <i>m</i> times but no more than <i>n</i> times
[:]	Specifies a character class and matches any character in that class
\	Can have 4 different meanings: 1. Stand for itself. 2. Quote the next character. 3. Introduce an operator. 4. Do nothing.
+	Matches one or more occurrence
?	Matches zero or one occurrence
.	Matches any character in the supported character set, except NULL
()	Grouping expression, treated as a single subexpression
[==]	Specifies equivalence classes
\n	Back-reference expression
[..]	Specifies one collation element, such as a multicharacter element

Using Meta Characters

Problem: Find 'abc' within a string:

Solution: `'abc'`

Matches: abc

Does not match: 'def'

1

Problem: To find 'a' followed by any character, followed by 'c'

Meta Character: any character is defined by '.'

Solution: `'a.c'`

Matches: abc

Matches: adc

Matches: alc

Matches: a&c

Does not match: abb

2

Problem: To find one or more occurrences of 'a'

Meta Character: Use '+' sign to match one or more of the previous characters

Solution: `'a+'`

Matches: a

Matches: aa

Does not match: bbb

3

Regular Expression Functions

Function Name	Description
REGEXP_LIKE	Similar to the LIKE operator, but performs regular expression matching instead of simple pattern matching
REGEXP_REPLACE	Searches for a regular expression pattern and replaces it with a replacement string
REGEXP_INSTR	Searches for a given string for a regular expression pattern and returns the position where the match is found
REGEXP_SUBSTR	Searches for a regular expression pattern within a given string and returns the matched substring

The REGEXP Function Syntax

```
REGEXP_LIKE (srcstr, pattern [,match_option])
```

```
REGEXP_INSTR (srcstr, pattern [, position [, occurrence  
[, return_option [, match_option]]])
```

```
REGEXP_SUBSTR (srcstr, pattern [, position  
[, occurrence [, match_option]])
```

```
REGEXP_REPLACE (srcstr, pattern [,replacestr [, position  
[, occurrence [, match_option]])
```

Performing Basic Searches

```
SELECT first_name, last_name
FROM employees
WHERE REGEXP_LIKE (first_name, '^Ste(v|ph)en$');
```

FIRST_NAME	LAST_NAME
Steven	King
Steven	Markle
Stephen	Stiles

Checking the Presence of a Pattern

```
SELECT street_address,  
       REGEXP_INSTR(street_address, '^[:alpha:]')  
FROM   locations  
WHERE  
       REGEXP_INSTR(street_address, '^[:alpha:]') > 1;
```

STREET_ADDRESS	REGEXP_INSTR(STREET_ADDRESS, '^[:ALPHA:]')
Magdalen Centre, The Oxford Science Park	9
Schwanthalerstr. 7031	16
Rua Frei Caneca 1360	4
Murtenstrasse 921	14
Pieter Breughelstraat 837	7
Mariano Escobedo 9991	8

Example of Extracting Substrings

```
SELECT REGEXP_SUBSTR(street_address , ' [^ ]+ ' )  
"Road" FROM locations;
```

Road
Via
Calle
Jabberwocky
Interiors
Zagora
Charade

...

Replacing Patterns

```
SELECT REGEXP_REPLACE( country_name, '(.)',  
                      '\1 ') "REGEXP_REPLACE"  
FROM countries;
```

REGEXP_REPLACE(COUNTRY_NAME, '()', '\1')
Argentina
Australia
Belgium
Brazil
Canada
Switzerland
China

...

Regular Expressions and Check Constraints

```
ALTER TABLE emp8  
  ADD CONSTRAINT email_addr  
  CHECK(REGEXP_LIKE(email, '@'))NOVALIDATE ;
```

1

```
INSERT INTO emp8 VALUES  
  (500, 'Christian', 'Patel',  
   'ChrisP2creme.com', 1234567890,  
   '12-Jan-2004', 'HR_REP', 2000, null, 102, 40) ;
```

2

```
INSERT INTO emp8 VALUES
```

```
*
```

ERROR at line 1:

ORA-02290: check constraint (ORA20.EMAIL_ADDR) violated

Summary

In this lesson, you should have learned how to use regular expression support in SQL and PL/SQL to search, match, and replace strings all in terms of regular expressions.