ĐẠI HỌC BÁCH KHOA HÀ NỘI
VIỆN CÔNG NGHỆ THÔNG TIN VÀ TRUYỀN THÔNG

IT4552 – Web programming

Chapter 3.1. Conditional Statements

Objectives

- To learn to use conditional test statements to compare numerical and string data values
- To learn to use looping statements to repeat statements
- To learn to use logical test operators to create com-pound conditional test statements

Content

Content

1. Conditional Test Statements

- Conditional statements provide a way for scripts to test for certain data values and then to react differently depending on the value found.
- Will examine
  - the if statement,
  - the elseif clause,
  - the else clause,
  - and the switch statement.

1.1. Using the if Statement

- Use an if statement to specify a test condition and a set of statements to run when a test condition is *true*.

```
if ($average > 69) {
    $Grade="Pass";
    print "Grade=$Grade ";
}
print "Your average was $average";
```

When $average is greater than 69 execute these statements.

- if `$average` was equal to 70 then the above would output:

```
Your average was 70
```

a. Test Expressions

- Test expressions use test operators within their expressions.
  - Test operators work much like the expression operators.
  - The if statement above uses the greater than (>) operator to test whether $average is greater than 69.
  - Test operators evaluate to *true* or *false*

PHP Test Operators

Operator Test	Effect	Example	Result

==	Equal to	if ($x == 6){
		   $x = $y + 1;
		   $y = $x + 1;
		}
			Run the second and third statements if the value of $x *is equal to* 6.

!=	Not equal to	if ($x != $y) {
		   $x = 5 + 1;
		}
			Run the second statement if the value of $x *is not equal to* the value of $y.

<	Less than	if ($x < 100) {
		   $y = 5;
		}
			Run the second statement if the value of $x *is less than* 100.

>	Greater than	if ($x > 51) {
		   print "OK";
		}
			Run the second statement if the value of $x *is greater than* 51.

>=	Greater than or equal to	if (16 >= $x) {
		   print "x=$x";
		}
			Run the second statement if 16 *is greater than or equal to* the value of $x.

<=	Less than or equal to	if (16 >= $x) {
		   print "x=$x";
		}
			Run the second and third statements if the value of $x *is less than or equal to* the value of $y.

A Full Example ...

- Consider the following application:
  - Receives two grades as input and determines whether their average is above 89.
  - It uses an HTML form for input grades:

```
Enter First Score <input type="text" size="4"
                  maxlength="7" name="grade1">
Enter Second Score <input type="text" size="4"
                  maxlength="7" name="grade2">
```

Sets $grade1

Sets $grade2

Receiving Code

```
<html>
<head><title>Decisions</title></head>
<body>
<?php
    $grade1= $_POST["grade1"];
    $grade2= $_POST["grade2"];
    $average = ($grade1 + $grade2) / 2;
    if ( $average > 89 ) {
       print "Average score: $average You got an A! <br>";
    }
    $max=$grade1;
   if ($grade1 < $grade2) {
      $max = $grade2;
    }
   print ("Your max score was $max");
?>
</body></html>
```

Get grade1 and grade2 from HTML form.

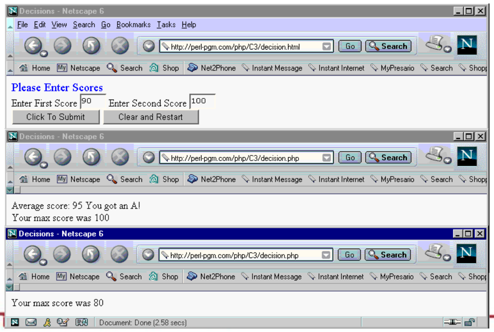
Calculate average

Output if $average is more than 89

Set when $grade2 is more than $grade1

A Full Example ...

```
The previous code can be executed at
```


Decisions - Netscape 6
File Edit View Search Go Bookmarks Tasks Help
http://perl-pgm.com/php/C3/decision.html
Go
Search
Home Netscape Search Shop Net2Phone Instant Message Instant Internet MyPresario Search Shop
http://perl-pgm.com/php/C3/decision.php
Document: Done (2.58 secs)

Please Enter Scores

Enter First Score 90 Enter Second Score 100

Click To Submit | Clear and Restart

Average score: 95 You got an A!
Your max score was 100

Your max score was 80

Data type conversion

Method 1 **(automatic)**

$var = "100" + 15;

$var = "100" + 15.0;

$var = 39 . " Steps";

Method 2: **(datatype) $var**

Method 3: **settype($var, "datatype")**

$var	(int)$var	(bool)$var	(string)$var
Null	0	false	""
true	1		"1"
false	0		""
"6 feet"	6	true	
"foo"	0	true	

b. Comparing Strings

- PHP represents strings using the ASCII code values (American Standard Code for Information Interchange).
  - ASCII provides a standard, numerical way to represent characters on a computer.
  - Every letter, number, and symbol is translated into a code number.
    - “A” is ASCII code 65, “B” is 66, “C” is 67, and so on.
    - Lowercase “a” is ASCII code 97, “b” is 98, “c” is 99, and s
    - ASCII “A” is less than ASCII “a,” “B” is less than “b,” and “c” is less than “d”.
    - ASCII characters have ASCII code values lower than letters. So ASCII character “1” is less than “a” or “A”

b. Comparing Strings (2)

- You can use == operator to check if one string is equal to another. For example,

```
$name1 = "George"; $name2 = "Martha";
if ($name1 == $name2) {
    print ("$name1 is equal to $name2" );
} else {
    print ("$name1 is not equal to $name2");
}
```

- Would output: “`George is not equal to Martha`”.

b. Comparing Strings (3)

- Also can use <, >, <=, and >= operators to compare string values using ASCII code values.
- For Example

```
$name1 = "George"; $name2 = "Martha";
if ($name1 < $name2) {
     print ("$name1 is less than $name2");
} else {
     print ("$name1 is not less than $name2");
}
```

- It would output “`George is less than Martha`”.

A Full Example ...

- Consider the following application:
  - Compares two input strings.
  - It uses the HTML form element that sets the variables $first and $second.

```
First Name: <input type="text" size="10"
             maxlength="15" name="first">
Second Name: <input type="text" size="10"
             maxlength="15" name="second">
```

Sets $first

Sets $second

Receiving Code

```
<html>
<head><title>String Comparison Results</title></head>
<body>
<?php
$first = $_POST["first"];
$second = $_POST["second"];
print ("First=$first Second=$second<br>");
if ($first == $second) {
  print ("$first and $second are equal");
}
if ($first < $second) {
   print ("$first is less than $second");
}
if ($first > $second) {
    print ("$first is greater than $second");
}
?></body></html>
```

Get the values of $first and $second

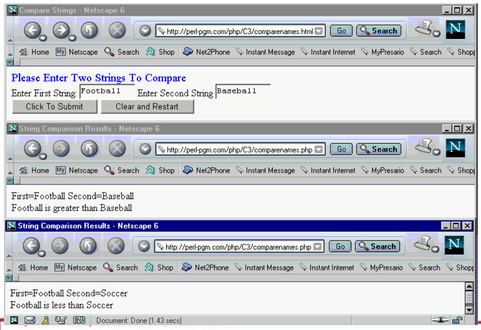
Output if $first is equal to $second

Set when $second is less than $first

Set when $first is more than $second

The Output ...

The previous code can be executed at


Compare Strings - Netscape 6
http://perl-pgm.com/php/C3/comparenames.html
Go
Search
Home
Netscape
Search
Shop
Net2Phone
Instant Message
Instant Internet
MyPresario
Search
Shop

Please Enter Two Strings To Compare

Enter First String: Football Enter Second String Baseball

Click To Submit | Clear and Restart

String Comparison Results - Netscape 6
http://perl-pgm.com/php/C3/comparenames.php

First=Football Second=Baseball
Football is greater than Baseball

String Comparison Results - Netscape 6
http://perl-pgm.com/php/C3/comparenames.php

First=Football Second=Soccer
Football is less than Soccer

Document: Done (1.43 secs)

c. Using the elseif Clause

❖ Use an elseif clause with an if statement to specify an additional test condition

```
    if (test expression) {
        one or more PHP statements
    } elseif (test expression){
        one or more PHP statements
    }
```

❖ The above script checks the elseif test expression when the test condition for the if statement is *false*.

c. Using the elseif Clause (2)

❖ One or more elseif clauses can be used with an if statement.

```
if ($hour < 9) {
   print "Sorry, it is too early.";
} elseif ($hour < 12) {
   print "Good morning. The hour is $hour. ";
   print "How can we help you?";
} elseif ($hour < 13) {
   print "Sorry, we are out to lunch. ";
} elseif ($hour < 17) {
   print "Good afternoon. The hour is $hour. ";
   print "How can we help you?";
} elseif ($hour <= 23) {
   print "Sorry, we have gone home already.";
}
```

Check this test expression when the first condition is *false*.

Check this test expression when the first two conditions are all *false*.

Check this test expression when the first three conditions are all *false*.

if $hour == 15, output "Good afternoon. The hour is 15. How can we help you?" if $hour == 24, then this code outputs nothing.

d. Using the else Clause

- Use an else clause with if and possibly one or more elseif clauses
  - Specify set of statements to run when all the previous test conditions are *false*.
  - Has the following general format shown in the

```
if (test expression) {
  one or more PHP statements
} else {
  one or more PHP statements
}
```

d. Using the else Clause (2)

- For example, if $count had a value of –75, then this code would output “Illegal value for count = –75”

```
if ( $count == 0 ) {
    print ("Time to reorder.");
    $reorder=1;
 } elseif ( $count == 1 ) {
    $reorder=1;
    print ("Warning: we need to start reordering.");
 } elseif ( $count > 1 ) {
    $reorder = 0;
    print ("We are OK for now.");
 } else {
    print ("Illegal value for count = $count");
 }
```

A Full Example ...

- Full example that extends the grade-averaging to determine a letter grade (A, B, C, D, or F) and to catch illegal input.
- Use the following HTML form for input

```
Enter First Score <input type="text" size="4"
                  maxlength="7" name="grade1">
Enter Second Score <input type="text" size="4"
                  maxlength="7" name="grade2">
```

Sets $grade1

Sets $grade2

Receiving Code

```
<html> <head><title>Grade Calculation</title></head>
<body>
<?php
$grade1 = $_POST["grade1"]; $grade2 = $_POST["grade2"];
$average = ($grade1 + $grade2) / 2;
if ($average > 89) {
   print ("Average=$average You got an A");
} elseif ($average > 79) {
   print ("Average=$average You got a B");
} elseif ($average > 69) {
   print ("Average=$average You got a C");
} elseif ($average > 59) {
   print ("Average=$average You got a D");
} elseif ($average >= 0) {
   print ("Grade=$grade You got an F");
} else {
   print ("Illegal average less than 0 average=$average");
}
$max=$grade1;
if ($grade1 < $grade2) {
$max = $grade2;
}
print ("<br>Your max score was $max");
?> </body></html>
```

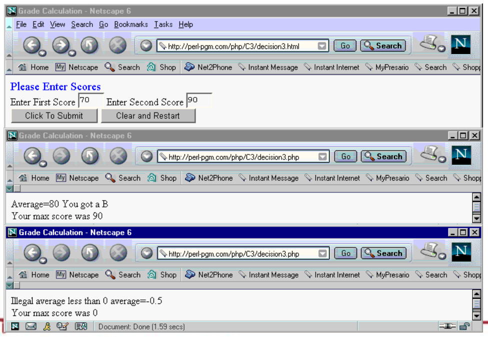
Get values of $grade1 and $grade2

Compute average of $grade1 and $grade2

Check if $average is an “A”, “B”,”C”, “D” or “F”

Would output the following...

```
The previous code can be executed at
```


Grade Calculation - Netscape 6
File Edit View Search Go Bookmarks Tasks Help
Go Search
Home My Netscape Search Shop Net2Phone Instant Message Instant Internet MyPresario Search Shop

http://perl-pgm.com/php/C3/decision3.html

Please Enter Scores

Enter First Score 70 Enter Second Score 90

Click To Submit | Clear and Restart

http://perl-pgm.com/php/C3/decision3.php

```
Average=80 You got a B
Your max score was 90
```

http://perl-pgm.com/php/C3/decision3.php

```
Illegal average less than 0 average=-0.5
Your max score was 0
```

Document: Done (1.59 secs)

1.2. Using the switch Statement

❖ Use switch statement as another conditional test

```
switch ($rating) {
  case 1:
    $rated = "Poor";
    print "The rating was $rated";
    break;
  case 2:
    $rated = "Fair";
    print "The rating was $rated";
    break;
  case 3:
    $rated = "Good";
    print "The rating was $rated";
    break;
  default:
    print "Error: that rating does not ex
}
```

Enclose in curly brackets

Run these when $rating has value 1.

Run these when $rating has value 2.

Run these when $rating has value 3.

When value not 1, 2, or 3.

Content

2. Using Loops to Repeat Statements

❖ Scripts can use loop statements to repeat sections of code

❖ Advantages of loops include
  - Scripts can be more concise
  - Can write more flexible scripts

❖ Will discuss while loops and for loops now
  - Will review foreach loops later

2.1. Using a for loop

❖ Use a **`for`** loop to repeat of set of statements a specific number of times.

The *initialization expression* sets the initial value of $i. Enclose statements to repeat in curly brackets.

The *iteration expression* increments $i at the end of each loop iteration.

The *loop-end condition* determines when the loop will end.

```
for ( $i = 0; $i < $max; $i++ ) {
    Set of statements to repeat
}
```

Note the use of ; after first 2 but not 3rd.

Full Script Example ...

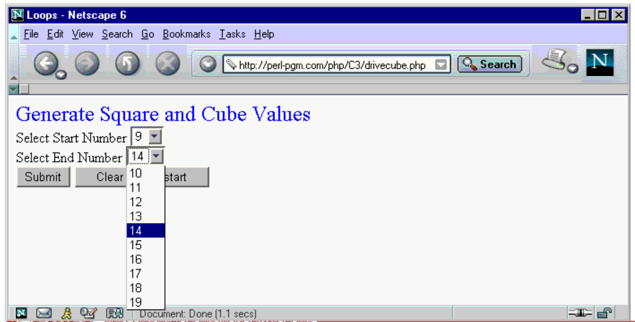
```
<html><head><title>Loops</title></head>
<body><font size="5" color="blue">
Generate Square and Cube Values </font>
<br>
<form action="http://webwizard.aw.com/~phppgm/C3/whileloop.php" method="post">
<?php
print ("Select Start Number");
print ("<select name=\"start\">");
for ($i=0; $i<10; $i++) {
      print ("<option>$i</option>");
}
print ("</select>");
print ("<br>Select End Number");
print ("<select name=\"end\">");
for ($i=10; $i<20; $i++) {
     print "(<option>$i</option>)";
}
print ("</select>");
?>
<br><input type="submit" value="Submit">
<input type="reset" value="Clear and Restart">  </form></body></html>
```

Repeat print statement 10 times with values 0, 1, 2, ... 9 for $i.

Repeat print statement 10 times with values 10, 11, 12, ... 19 for $i.

Would output the following...

The previous code can be executed at


Loops - Netscape 6
File Edit View Search Go Bookmarks Tasks Help
http://perl-pgm.com/php/C3/drivecube.php
Search
Document: Done (1.1 secs)

Generate Square and Cube Values

Select Start Number 9

Select End Number 14

Submit Clear and Restart

10 11 12 13 14 15 16 17 18 19

2.2. Using the while loop

❖ Use the while loop to repeat a set of statements as long as a conditional test is true.

Test condition enclosed in parenthesis

Repeat as long as the conditional test is *true*.

```
while ($ctr < $max) {
        Set of statements to repeat
}
```

Enclose in curly brackets

2.2. Using the while loop (2)

- A while loop will repeat as long as the loop conditional test is *true*.
  - If initially *false*, then the statements within the loop body will never run.
- A bad idea to create an Infinite Loop
  - If the loop conditional test always *true*, then the loop will never end (infinite loop).
  - It will consume resources on the Web server and possibly slow down other server activity. (might have to exit the window that's running your script)

A Full Script Example

```
<html>
<head><title>While Loop</title></head>
<body>
<font size="4" color="blue"> Table of Square and Cube Values
</font>
<table border=1>
<th> Numb </th> <th> Sqr </th> <th> Cubed </th>
<?php
   $start = $_POST["start"];  $end = $_POST["end"];
   $i = $start;
    while ($i <= $end) {
       $sqr=$i*$i;
       $cubed=$i*$i*$i;
      print ("<tr><td>$i</td><td>$sqr</td><td>$cubed</td></tr>");
       $i = $i + 1;
    }
?></table></body></html>
```

The Output ...

The previous code can be executed at

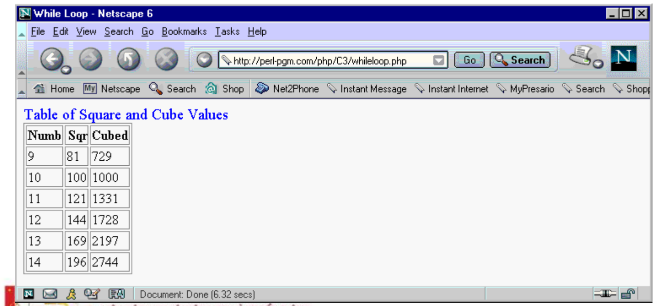

While Loop - Netscape 6
File Edit View Search Go Bookmarks Tasks Help
http://perl-pgm.com/php/C3/whileloop.php
Go
Search
Home
Netscape
Search
Shop
Net2Phone
Instant Message
Instant Internet
MyPresario
Search
Document: Done (6.32 secs)

Table of Square and Cube Values

Numb	Sqr	Cubed
9	81	729
10	100	1000
11	121	1331
12	144	1728
13	169	2197
14	196	2744

TIP Using Either the while Loop or the for Loop for Some Problems

- For some loops you can use either the while loop or the for loop.

  -
    ```
    for ( $i=0; $i<5; $i++ ) {
         print "i=$i ";
    }
    ```

  -
    ```
    $i = 0;
    while ($i < 5 ) {
         print "i=$i "; $i=$i + 1;
    }
    ```

The two above loops both output "i=0 i=1 i=2 i=3 i=4".

2.3. Using Logical Test Operators

- PHP supports a set of logical test operators you can use to create compound test expressions
  - used within an if statement or a while statement to specify more than one test condition.
  - For example, consider the following line

```
while ($x > $max && $found != 1) {
        . . .
}
```

Logical Test Operators

- PHP supports three logical test operators.
  - &&: *the AND operator*
  - *||: the OR operator*
  - !: *the NOT operator*

And Operator

- Use in if statements and while loops.
- E.g.:

```
while ($ctr < $max && $flag == 0) {
    …
}
```

Whenever either of these expressions is *false*, the loop will terminate.

Or operator

- *U*sed much like the AND operator in if statements andwhile loops.
- E.g.
  - if ($ctr != $max || $flag == 0) {

Carries out the statements within the if statement if either $ctr is not equal to $max or $flag is equal to 0.

Not operator

- *U*sed to test whether an expression is *fals*e (used in while loops and in if statements).
- E.g.
  - if (!$flag == 0) {

This statement is *true* when `$flag` is anything except `0`.

41

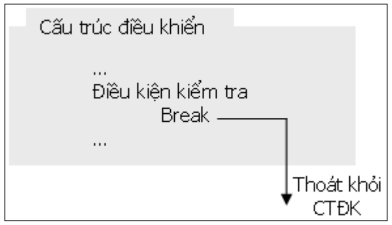
=== operator

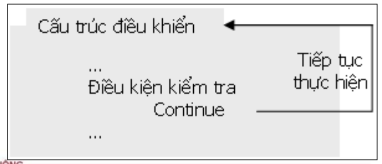
- *Perform equality comparison with objects of the same data type*
- E.g.

```
<?php
     $a = “6”;
     $b = “6”;
     $kq = “”;
     if ($a===$b)
           $kq = “a equals b and has the same data type”;
?>
```

42

break and continue





43

Example

- Asks the user to guess a “secret” two-digit combination, uses logical test operators.
- The Input HTML form uses the following to set pick1. A similar group sets a variable pick2.
  - <font size=4 > Pick a number from 1 to 9 <br>
  - <input type="radio" name="pick1" value="1">1
  - <input type="radio" name="pick1" value="2">2
  - <input type="radio" name="pick1" value="3">3
  - <input type="radio" name="pick1" value="4">4
  - <input type="radio" name="pick1" value="5">5
  - <input type="radio" name="pick1" value="6">6
  - <input type="radio" name="pick1" value="7">7
  - <input type="radio" name="pick1" value="8">8
  - <input type="radio" name="pick1" value="9">9

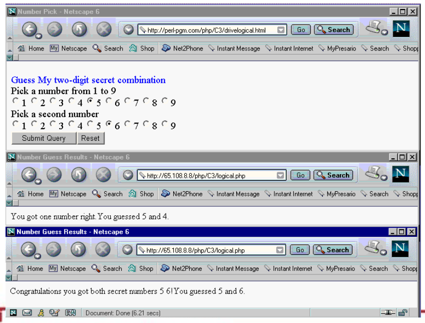
44

A Full Script Example …

```
<html><head><title>Number Guess Results </title><head>
<body>
<?php
$pick1 =$_POST["pick1"]; $pick2 =$_POST["pick2"];
$combo1=5;
$combo2=6;
if (($pick1 == $combo1) && ($pick2 == $combo2)) {
     print ("Congratulations you got both secret numbers $combo1 $combo2!");
} elseif (($pick1 == $combo1) || ($pick2 == $combo2)){
      print ("You got one number right.");
} else {
     print ("Sorry, you are totally wrong!");
}
print ("You guessed $pick1 and $pick2.");
?></body></html>
```

The Output ...

The previous code can be executed at


Number Pick - Netscape 6
http://perl-pgm.com/php/C3/drivelogical.html
Go
Search
Home
Netscape
Search
Shop
Net2Phone
Instant Message
Instant Internet
MyPresario
Search
Shop

Guess My two-digit secret combination
Pick a number from 1 to 9
○ 1 ○ 2 ○ 3 ○ 4 ● 5 ○ 6 ○ 7 ○ 8 ○ 9
Pick a second number
○ 1 ○ 2 ○ 3 ○ 4 ○ 5 ● 6 ○ 7 ○ 8 ○ 9
Submit Query Reset

Number Guess Results - Netscape 6
http://65.108.8.8/php/C3/logical.php

You got one number right. You guessed 5 and 4.

Number Guess Results - Netscape 6
http://65.108.8.8/php/C3/logical.php

Congratulations you got both secret numbers 5 6! You guessed 5 and 6.

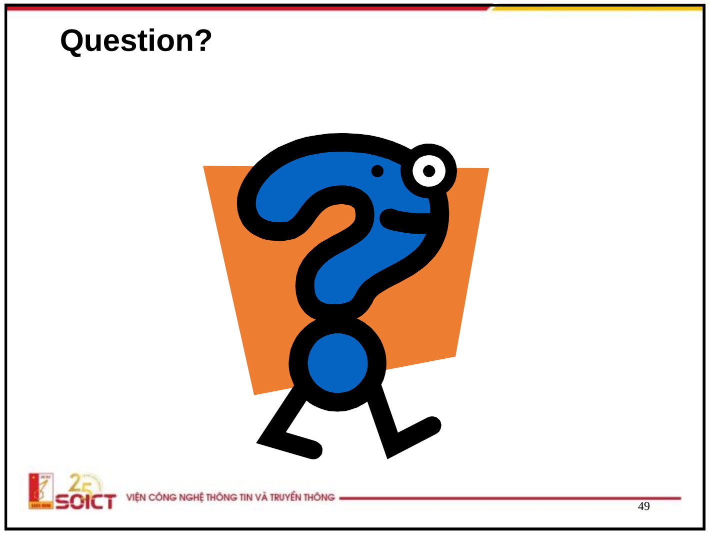
Document: Done (6.21 secs)

Summary

- Use conditional statements to test for certain conditions and, based on the results of the test, to run specific script statements.
- Loops expand the types of programming problems that you can solve and allow you to solve some programming problems much more concisely
- Use logical AND (&&), OR (||) and NOT (!) operators to carry out compound tests.

Summary

- Variables are used to store and access data in computer memory. You can associate a value with a variable, change that value, print it out, and perform many different operations on it.
- PHP supports both numeric and string variables. String variables use different methods for value manipulation (for example, concatenation) than numeric variables do.



Question?