Vietnam and Japan Joint
ICT HRD Program

ITC 5 – Web Programming

Chapter 3.1. Conditional Statements

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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

1. Using Conditional Test Statements
2. Using Loops to Repeat Statements

Content

⇨ 1. Using Conditional Test Statements
2. Using Loops to Repeat Statements

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

```
1. <html>
2. <head><title>Decisions</title></head>
3. <body>
4. <?php
5.     $average = ($grade1 + $grade2) / 2;
6.     if ( $average > 89 ) {
7.        print "Average score: $average You got an A! <br>";
8.     }
9.     $max=$grade1;
10.       if ($grade1 < $grade2) {
11.          $max = $grade2;
12.        }
13.       print ("Your max score was $max");
14. ?>
15. </body></html>
```

Calculate average

Output if $average is more than 89

Set when $grade2 is more than $grade1

Receiving Code With REGISTER_GLOBALS off

```
1. <html>
2. <head><title>Decisions</title></head>
3. <body>
4. <?php
5.     $grade1= $_POST["grade1"];
6.     $grade2= $_POST["grade2"];
5.     $average = ($grade1 + $grade2) / 2;
6.     if ( $average > 89 ) {
7.        print "Average score: $average You got an A! <br>";
8.     }
9.     $max=$grade1;
10.       if ($grade1 < $grade2) {
11.          $max = $grade2;
12.        }
13.       print ("Your max score was $max");
14. ?>
15. </body></html>
```

Get grade1 and grade2 from HTML form.

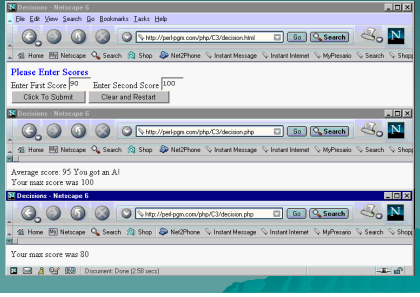
Calculate average

Output if $average is more than 89

Set when $grade2 is more than $grade1

A Full Example ...

The previous code can be executed at
http://webwizard.aw.com/~phppgm/C3/decision.html



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

```
1. <html>
2. <head><title>String Comparison Results</title></head>
3. <body>
4. <?php
5. print ("First=$first Second=$second<br>");
6. if ($first == $second) {
7.   print ("$first and $second are equal");
8. }
9. if ($first < $second) {
10.   print ("$first is less than $second");
11. }
12. if ($first > $second) {
13.    print ("$first is greater than $second");
14. }
15. ?></body></html>
```

Output if $first is equal to $second

Set when $second is less than $first

Set when $first is more than $second

Receiving Code With REGISTER_GLOBALS OFF

```
1. <html>
2. <head><title>String Comparison Results</title></head>
3. <body>
4. <?php
5. $first = $_POST["first"];
6. $second = $_POST["second"];
7. print ("First=$first Second=$second<br>");
8. if ($first == $second) {
9.   print ("$first and $second are equal");
10. }
11. if ($first < $second) {
12.   print ("$first is less than $second");
13. }
14. if ($first > $second) {
15.    print ("$first is greater than $second");
16. }
17. ?></body></html>
```

Get the values of $first and $second

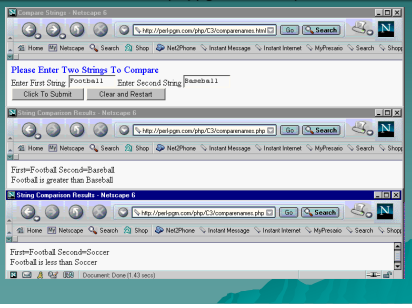
Output if $first is equal to $second

Set when $second is less than $first

Set when $first is more than $second

The Output ...

The previous code can be executed at
http://webwizard.aw.com/~phppgm/C3/comparenames.html



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

```
1. <html>
2. <head><title>Grade Calculation</title></head>
3. <body>
4. <?php
5. $average = ($grade1 + $grade2) / 2;
6. if ($average > 89) {
7.    print ("Average=$average You got an A");
8. } elseif ($average > 79) {
9.    print ("Average=$average You got a B");
10. } elseif ($average > 69) {
11.    print ("Average=$average You got a C");
12. } elseif ($average > 59) {
13.    print ("Average=$average You got a D");
14. } elseif ($average >= 0) {
15.    print ("Grade=$grade You got an F");
16. } else {
17.    print ("Illegal average less than 0 average=$average");
18. }
19. $max=$grade1;
20. if ($grade1 < $grade2) {
21. $max = $grade2;
22. }
23. print ("<br>Your max score was $max");
24. ?> </body></html>
```

Compute average of $grade1 and $grade2

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

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Receiving Code With REGISTER_GLOBALS Off

```
1. <html> <head><title>Grade Calculation</title></head>
2. <body>
3. <?php
4. $grade1 = $_POST["grade1"];  $grade2 = $_POST["grade2"];
5. $average = ($grade1 + $grade2) / 2;
6. if ($average > 89) {
7.    print ("Average=$average You got an A");
8. } elseif ($average > 79) {
9.    print ("Average=$average You got a B");
10. } elseif ($average > 69) {
11.    print ("Average=$average You got a C");
12. } elseif ($average > 59) {
13.    print ("Average=$average You got a D");
14. } elseif ($average >= 0) {
15.    print ("Grade=$grade You got an F");
16. } else {
17.    print ("Illegal average less than 0 average=$average");
18. }
19. $max=$grade1;
20. if ($grade1 < $grade2) {
21. $max = $grade2;
22. }
23. print ("<br>Your max score was $max");
24. ?> </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"

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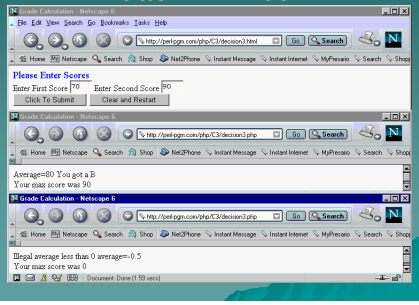
Would output the following…

The previous code can be executed at
http://webwizard.aw.com/~phppgm/C3/decision.php



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1.2. Using the switch Statement

- Use switch statement as another conditional test

```
1. switch ($rating) {
2.   case 1:
3.     $rated = "Poor";
4.     print "The rating was $rated";
5.     break;
6.   case 2:
7.     $rated = "Fair";
8.     print "The rating was $rated";
9.     break;
10.  case 3:
11.    $rated = "Good";
12.    print "The rating was $rated";
13.    break;
14.  default:
15.    print "Error: that rating does not exist";
16. }
```

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.

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Content

1. Using Conditional Test Statements
2. Using Loops to Repeat Statements

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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

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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 ...

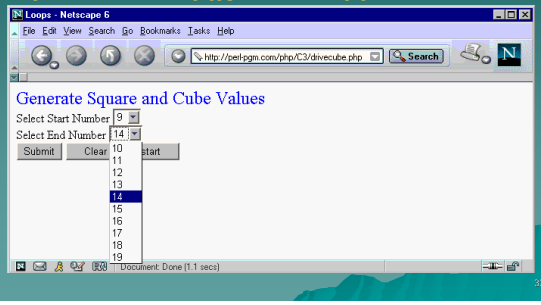
```
1. <html><head><title>Loops</title></head>
2. <body><font size="5" color="blue">
3. Generate Square and Cube Values </font>
4. <br>
5. <form action="http://webwizard.aw.com/~phppgm/C3/whileloop.php" method="post">
6. <?php
7. print ("Select Start Number");
8. print ("<select name=\"start\">");
9. for ($i=0; $i<10; $i++) {
10.      print ("<option>$i</option>");
11. }
12. print ("</select>");
13. print ("<br>Select End Number");
14. print ("<select name=\"end\">");
15. for ($i=10; $i<20; $i++) {
16.     print "(<option>$i</option>)";
17. }
18. print ("</select>");
19.?>
20. <br><input type="submit" value="Submit">
21. <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.

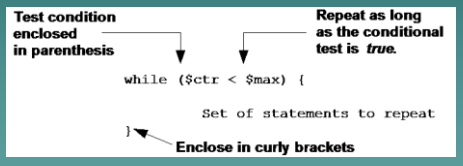
Would output the following...

The previous code can be executed at
http://webwizard.aw.com/~phppgm/C3/drivecube.php



2.2. Using the while loop

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



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 ...

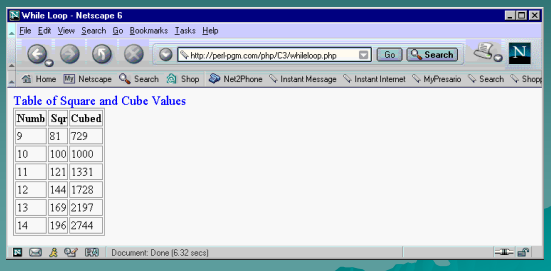
```
1. <html>
2. <head><title>While Loop</title></head>
3. <body>
4. <font size="4" color="blue"> Table of Square and Cube Values
</font>
5. <table border=1>
6. <th> Numb </th> <th> Sqr </th> <th> Cubed </th>
7. <?php
8.     $i = $start;
9.     while ($i <= $end) {
10.        $sqr=$i*$i;
11.        $cubed=$i*$i*$i;
12.        print ("<tr><td>$i</td><td>$sqr</td><td>$cubed</td></tr>");
13.        $i = $i + 1;
14.    }
15.?></table></body></html>
```

A Full Script Example (with RESGISTER_GLOBALS off)

```
1. <html>
2. <head><title>While Loop</title></head>
3. <body>
4. <font size="4" color="blue"> Table of Square and Cube Values
   </font>
5. <table border=1>
6. <th> Numb </th> <th> Sqr </th> <th> Cubed </th>
7. <?php
8.     $start = $_POST["start"];   $end = $_POST["end"];
9.     $i = $start;
10.     while ($i <= $end) {
11.        $sqr=$i*$i;
12.        $cubed=$i*$i*$i;
13.       print ("<tr><td>$i</td><td>$sqr</td><td>$cubed</td></tr>");
14.        $i = $i + 1;
15.     }
16.?></table></body></html>
```


The Output ...

The previous code can be executed at
http://webwizard.aw.com/~phppgm/C3/whileloop.php



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

- *O*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

- *O*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`.

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
  - <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

A Full Script Example ...

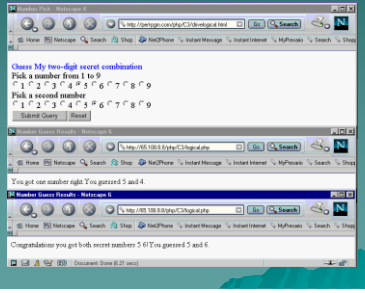
```
1. <html><head><title>Number Guess Results </title><head>
2. <body>
3. <?php
4. $combo1=5;
5. $combo2=6;
6. if (($pick1 == $combo1) && ($pick2 == $combo2)) {
7.      print ("Congratulations you got both secret numbers
$combo1 $combo2!");
8. } elseif (($pick1 == $combo1) || ($pick2 == $combo2)){
9.      print ("You got one number right.");
10. } else {
11.     print ("Sorry, you are totally wrong!");
12. }
13. print ("You guessed $pick1 and $pick2.");
14. ?></body></html>
```


A Full Script Example … with REGISTER_GLOBALS off

```
1. <html><head><title>Number Guess Results </title><head>
2. <body>
3. <?php
4. $pick1 =$_POST["pick1"]; $pick2 =$_POST["pick2"];
5. $combo1=5;
6. $combo2=6;
7. if (($pick1 == $combo1) && ($pick2 == $combo2)) {
8.      print ("Congratulations you got both secret numbers
$combo1 $combo2!");
9. } elseif (($pick1 == $combo1) || ($pick2 == $combo2)){
10.      print ("You got one number right.");
11. } else {
12.     print ("Sorry, you are totally wrong!");
13. }
14. print ("You guessed $pick1 and $pick2.");
15. ?></body></html>
```


The Output ...

The previous code can be executed at
http://webwizard.aw.com/~phpgm/C3/drivelogical.html



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.

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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.

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Question?

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