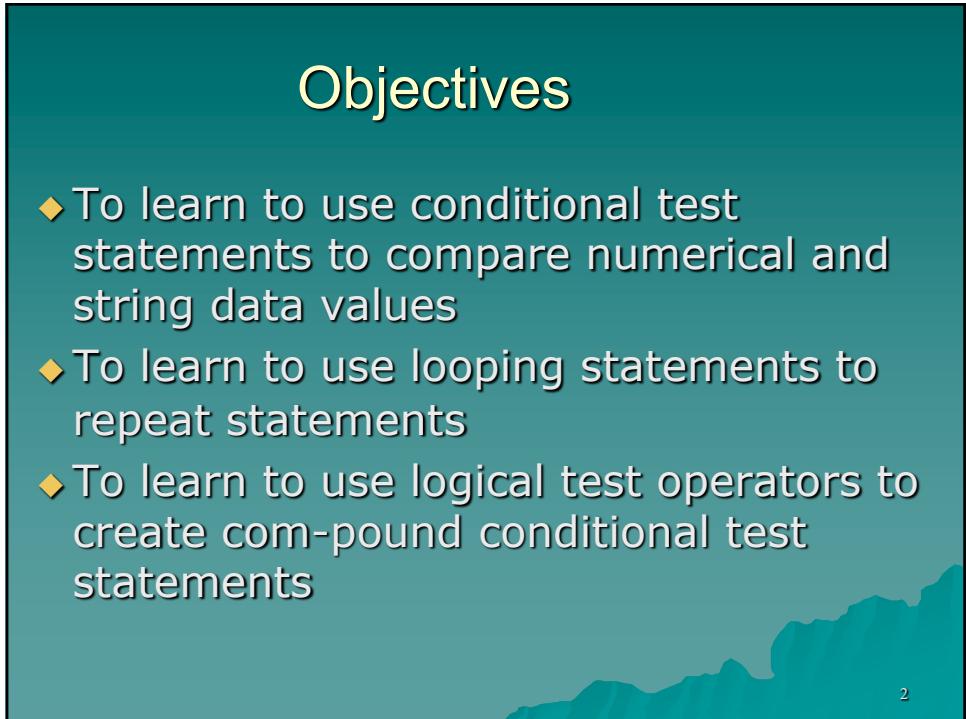


Web Programming

Chapter 3.1. Conditional Statements

1



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 compound conditional test statements

2

2

Content

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

3

Content

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

4

4

2

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.

5

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
```

6

6

3

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*

7

7

PHP Test Operators

Operator Test	Effect	Example	Result
==	Equal to	<code>if (\$x == 6){ \$x = \$y + 1; \$y = \$x + 1; }</code>	Run the second and third statements if the value of \$x is equal to 6.
!=	Not equal to	<code>if (\$x != \$y) { \$x = 5 + 1; }</code>	Run the second statement if the value of \$x is not equal to the value of \$y.
<	Less than	<code>if (\$x < 100) { \$y = 5; }</code>	Run the second statement if the value of \$x is less than 100.
>	Greater than	<code>if (\$x > 51) { print "OK"; }</code>	Run the second statement if the value of \$x is greater than 51.
>=	Greater than or equal to	<code>if (16 >= \$x) { print "x=\$x"; }</code>	Run the second statement if 16 is greater than or equal to the value of \$x.
<=	Less than or equal to	<code>if (16 >= \$x) { print "x=\$x"; }</code>	Run the second and third statements if the value of \$x is less than or equal to the value of \$y.

8

4

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

9

9

Receiving Code

```
1. <html>  
2. <head><title>Decisions</title></head>  
3. <body>  
4. <?php  
5.     $average = ($grade1 + $grade2) / 2; ← Calculate average  
6.     if ( $average > 89 ) {  
7.         print "Average score: $average You got an A! <br>"; ← Output if $average  
8.     }  
9.     $max=$grade1; ← is more than 89  
10.    if ($grade1 < $grade2) {  
11.        $max = $grade2; ← Set when $grade2 is  
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

10

10

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"];
7.     $average = ($grade1 + $grade2) / 2;
8.     if ( $average > 89 ) {
9.         print "Average score: $average You got an A! <br>";
10.        if ($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

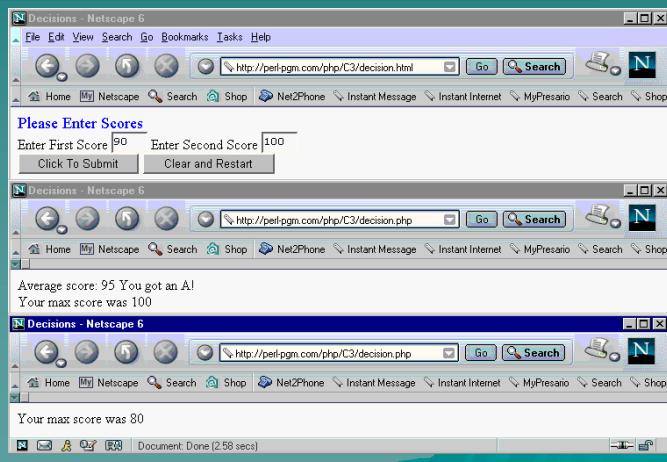
Set when \$grade2 is more than \$grade1

11

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A Full Example ...

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



12

12

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 so on.
 - ◆ 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"

13

13

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".

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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".

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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

16

16

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

17

17

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

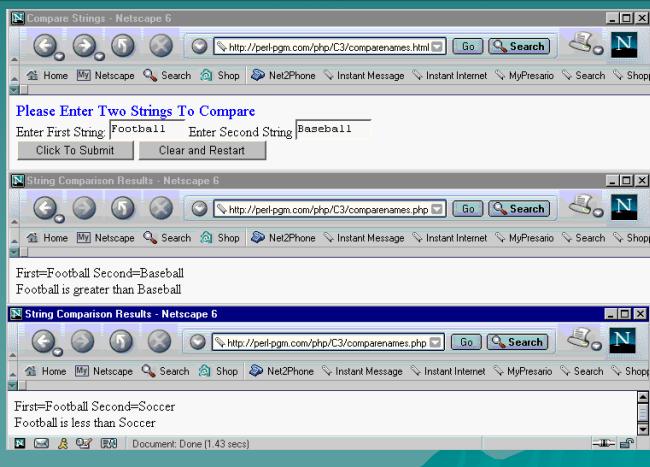
Set when \$first is more than \$second

18

18

The Output ...

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



19

19

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*.

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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.

21

21

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  
}
```

22

22

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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");  
}
```

23

23

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">
```

Sets
\$grade1

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

Sets
\$grade2

24

24

Receiving Code

```
1. <html>
2. <head><title>Grade Calculation</title></head>
3. <body>
4. <?php
5. $average = ($grade1 + $grade2) / 2; ← Compute average of
   $grade1 and $grade2
6. if ($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"

25

25

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; ← Compute average of
   $grade1 and $grade2
6. if ($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

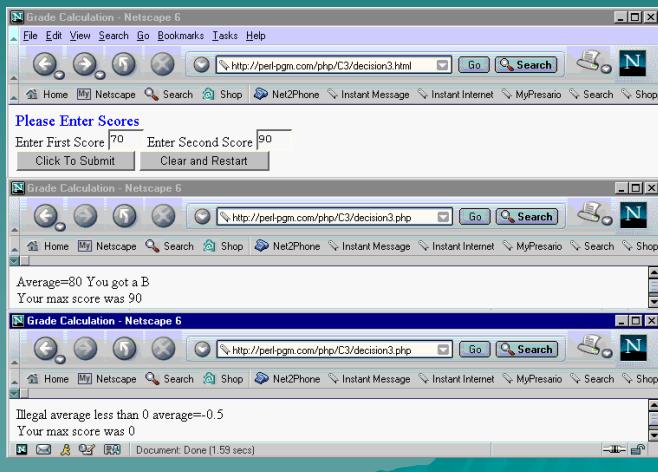
Check if \$average
is an "A", "B", "C",
"D" or "F"

26

26

Would output the following...

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



27

1.2. Using the switch Statement

◆ Use switch statement as another conditional test

```
1. switch ($rating) { ← Enclose in curly brackets
2.   case 1: ← Run these when $rating has
3.     $rated = "Poor"; ← value 1.
4.     print "The rating was $rated";
5.     break;
6.   case 2: ← Run these when $rating has
7.     $rated = "Fair"; ← value 2.
8.     print "The rating was $rated";
9.     break;
10.  case 3: ← Run these when $rating has
11.    $rated = "Good"; ← value 3.
12.    print "The rating was $rated";
13.    break;
14.  default: ← When value not 1, 2, or 3.
15.    print "Error: that rating does not exist";
16. }
```

28

28

Content

1. Using Conditional Test Statements

⇒ 2. Using Loops to Repeat Statements

29

29

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.

31

31

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.

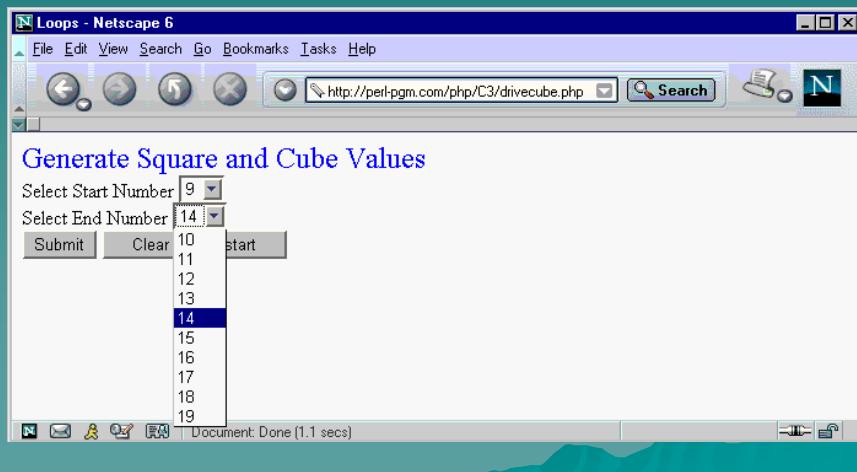
32

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Would output the following...

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



Generate Square and Cube Values

Select Start Number 9

Select End Number 14

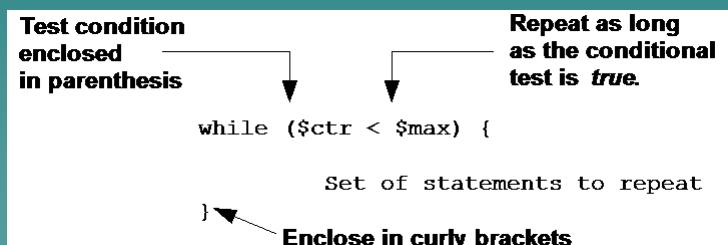
Submit Clear start

10
11
12
13
14
15
16
17
18
19

33

2.2. Using the while loop

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



34

34

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)

35

35

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>
```

36

36

18

A Full Script Example (with REGISTER_GLOBALS off)

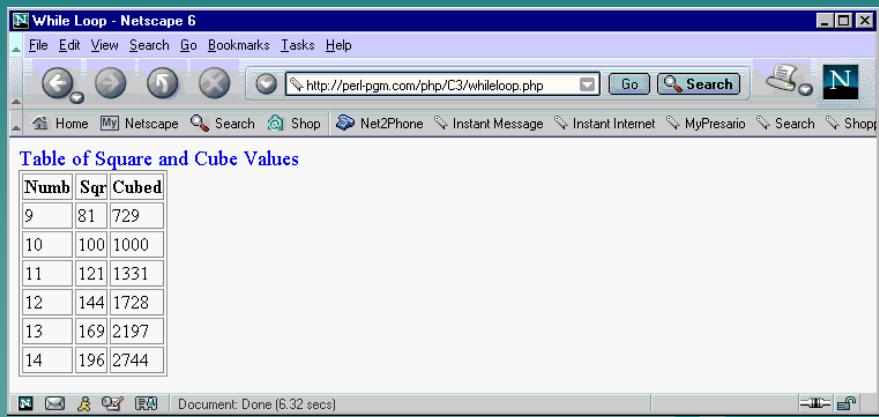
```
1. <html>
2. <head><title>While Loop</title></head>
3. <body>
4. <font size="4" color="blue"> Table of Square and Cube Values
5. </font>
6. <table border=1>
7.   <th> Numb </th> <th> Sqr </th> <th> Cubed </th>
8.   $start = $_POST["start"];  $end = $_POST["end"];
9.   $i = $start;
10.  while ($i <= $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>
```

37

37

The Output ...

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



38

38

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”.

39

39

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) {  
    ...  
}
```

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Logical Test Operators

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

41

41

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.

42

42

21

Or operator

- ◆ Used much like the AND operator in if statements and while 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.

43

43

Not operator

- ◆ Used to test whether an expression is *false* (used in while loops and in if statements).

- ◆ E.g.

```
- if (!$flag == 0) {
```

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

44

44

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.
 - ◆ 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

45

45

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>
```

46

46

A Full Script Example ... with REGISTER_GLOBALS off

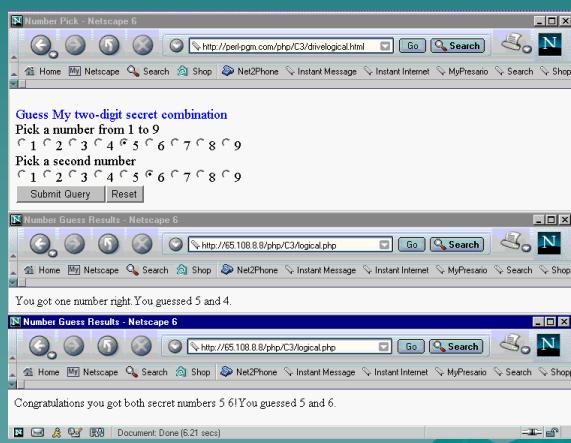
```
1. <html><head><title>Number Guess Results </title></head>
2. <body>
3. <?php
4. $pick1 =$_POST["pick1"]; $pick2 =$_POST["pick2"];
5. $combo1=5;
6. $combo2=6;
7. if (($pick1 == $combo1) && ($pick2 == $combo2)) {
8.     print ("Congratulations you got both secret numbers
$combo1 $combo2!");
9. } elseif (($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>
```

47

47

The Output ...

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



48

48

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.

49

49

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.

50

50

Question?



51

51

26