IT4552 – 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

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Content

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

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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.

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

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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

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.

8

2

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:

Sets $grade1

```
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 $grade2

Receiving Code

```
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>
```

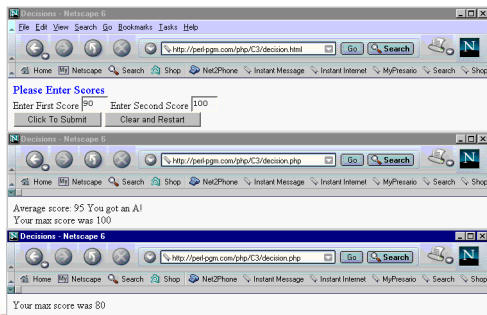Get grade1 and grade2 from HTML form.

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

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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`".

13

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`".

14

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

15

Receiving Code

```
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>
```
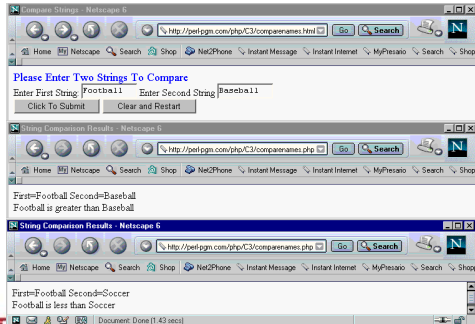
Get the values of $first and $second

Output if $first is equal to $second

Set when $second is less than $first

Set when $first is more than $second

16

The Output ...

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

17

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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*.

18

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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.

19

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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
}
```

20

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");
```

21

21

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

22

22

Receiving Code

```
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>
```
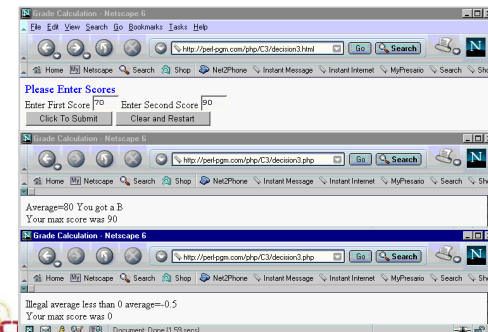
Get values of $grade1 and $grade2

Compute average of $grade1 and $grade2

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

23

23

Would output the following...

The previous code can be executed at

24

24

6

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 ex
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.

25

Content

26

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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

27

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.

28

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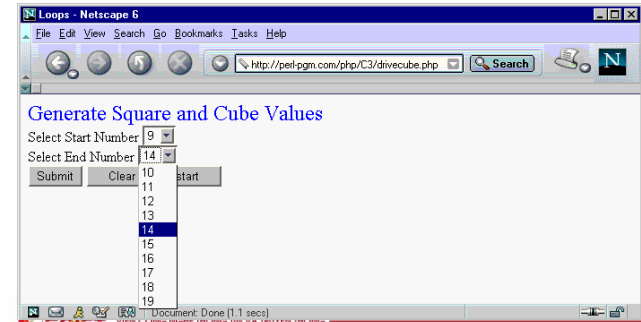
Repeat print statement 10 times with values 0, 1, 2, ... 9 for $i.

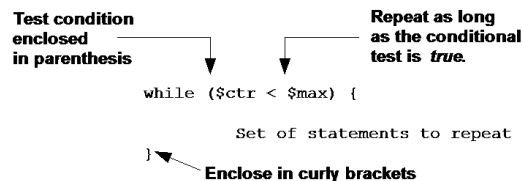Repeat print statement 10 times with values 10, 11, 12, ... 19 for $i.

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29

Would output the following...

The previous code can be executed at

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30

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

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31

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)

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32

29

30

31

32

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.      $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>
```
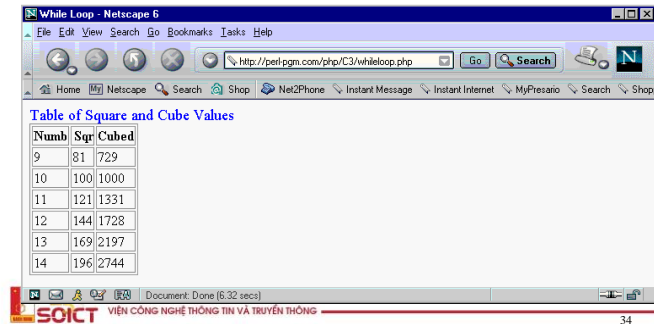
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33

33

The Output ...

The previous code can be executed at

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34

34

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".

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35

35

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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36

36

Logical Test Operators

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

37

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.

38

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.

39

Not operator

❖ *U*sed 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.

40

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

41

## A Full Script Example …

```
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>
```

42

The Output ...

The previous code can be executed at
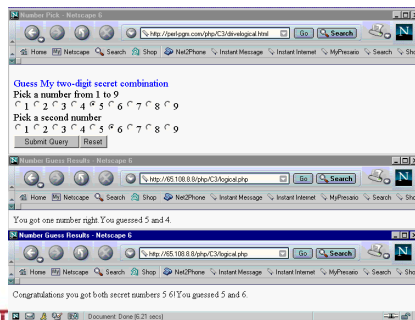
43

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.

44

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.

45

Question?

46