WEBD 236

Web Information Systems Programming

Week 4

Todd Whittaker and Scott Sharkey
(sharkesc@franklin.edu)

FRANKLIN UNIVERSITY

Agenda

- This week's expected outcomes
- This week's topics
- This week's homework
- Upcoming deadlines
- Questions and answers

Week 4 Outcomes

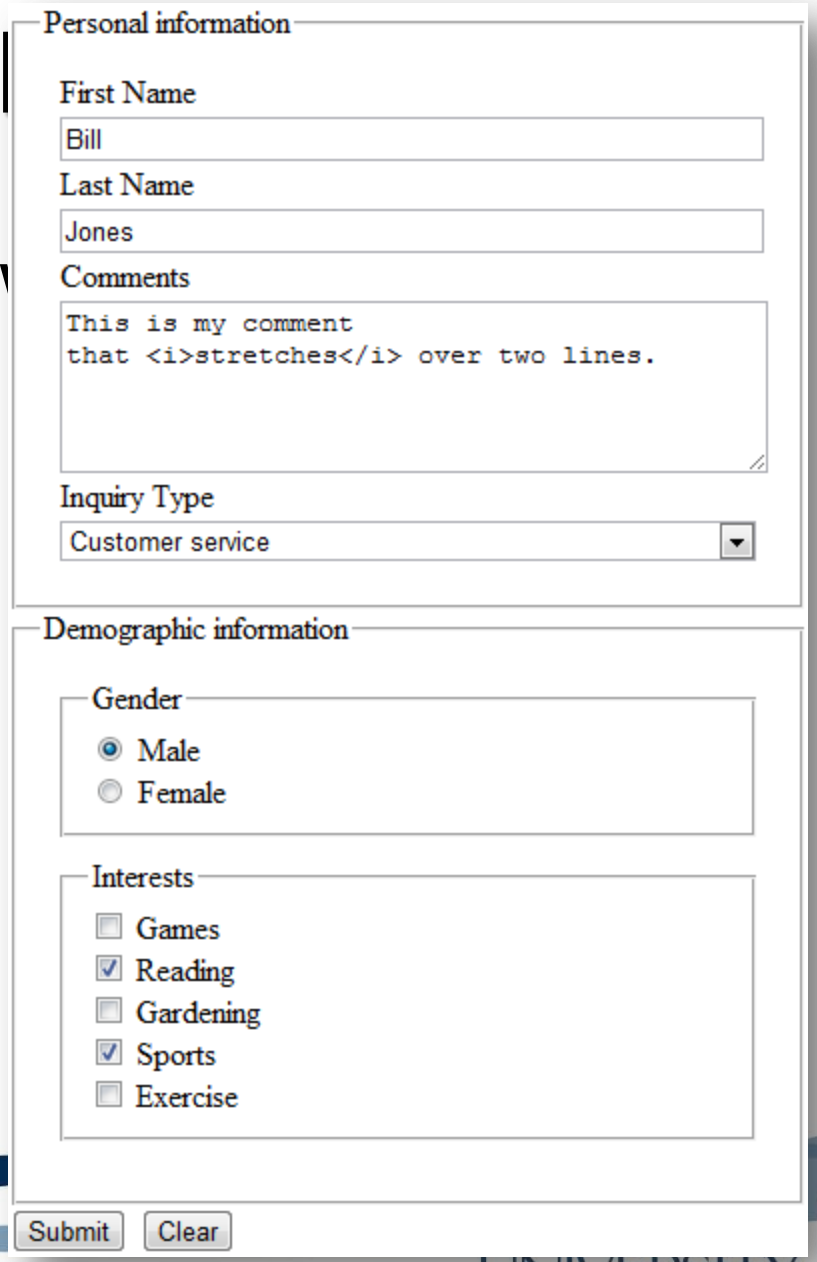
- Create HTML forms
- Access form data from a script
- Construct algorithms using selection and repetition structures.

Web Forms

- Basic HTML-based web-form elements
  - Fieldsets
  - Labels
  - Text boxes
  - Text areas
  - Buttons
  - Radio buttons
  - Check boxes
  - Combo boxes

Web

- Basic HTML-based
  - Fieldsets
  - Labels
  - Text boxes
  - Text areas
  - Buttons
  - Radio buttons
  - Check boxes
  - Combo boxes



Web Forms

```
<form action='formelements.php' method='post'>
 <fieldset>
   <legend>Personal information</legend>
   <label for='firstName'>First Name</label>
   <input type='text' id='firstName' name='firstName' />
   <label for='lastName'>Last Name</label>
   <input type='text' id='lastName' name='lastName' />
   <label for='comments'>Comments</label>
   <textarea id='comments' name='comments' rows='5'
      cols='40'></textarea>
```

Web Forms

```
<form action='formelements.php' method='post'>
  <fieldset>
    <legend>Personal information</lege
    <label for='firstName'>First Name</lab
    <input type='text' id='firstName'
    <label for='lastName'>Last Nan
    <input type='text' id='lastName'
    <label for='comments'>Comme
    <textarea id='comments' name=
       cols='40'></textarea>
```

Any input, textarea, select, etc., within the form will be submitted

- action: script to receive data
- method: get or post

Web Forms

```
<form action='formelements.php' method='post'>
  <fieldset>
    <legend>Personal information</legend>
    <label for='firstName'>First Name</label>
    <input type='text' id='firstName' name='firstName' />
    <label for='lastName'>Last Name</label>
    <input type='text' id='lastName' name='lastName' />
    <label for='comments'>Comments</label>
    <textarea id='comments' name='comments' rows='5'
      cols='40'></textarea>
  </fieldset>
</form>
```

fieldset groups related fields graphically (no effect on what the server receives). legend describes the fieldset.

Web Forms

```
<form action='formelements.php' method='post'>
 <fieldset>
   <legend>Personal information</legend>
   <label for='firstName'>First Name</label>
   <input t e='text' id='firstName' name='firstName' />
   <label  lastName'>Last Name</label>
   <inpu  text' id='lastName' name='lastName' />
   <lab  mments'>Comments</label>
                                    ' rows='5'
```

Labels are click targets. Clicking a label activates the input control (associated by for='someid' in the label and id='someid' in the input control).

Web Forms

```
<form action='formelements.php' method='post'>
  <fieldset>
    <legend>Personal information</legend>
    <label for='firstName'>First Name</label>
    <input type='text' id='firstName' name='firstName' />
    <label for='lastName'>Last Name</label>
    <input type='text' id='lastName' name='lastNar     />
    <label for='comments'>Comments</label>
    <textarea id='comments' name='comments' ro
       cols='40'></textarea>
```

PHP receives these data into the $_GET, $_POST, or $_REQUEST superglobals according to the name attribute.

Web Forms

```
<form action='formelements.php' method='post'>
 <fieldset>
  <legend>Personal information</legend>
  <label for='firstName'>First Name</label>
  <input type='text' id='firstName' name='firstName' />
  <label for='lastName'>Last Name</label>
  <input type='text' id='lastName' name='lastName' />
  <label for='comments'>Comments</label>
  <textarea id='comments' name='comments' rows='5'
    cols='
```

type='text' produces a single-line text box for input.

Web Forms

```
<form action='formelements.php' method=
  <fieldset>
    <legend>Personal information</legend
    <label for='firstName'>First Name</lab
    <input type='text' id='firstName' name=
    <label for='lastName'>Last Name</labe
    <input type='text' id='lastName' name='las
    <label for='comments'>Comments</label>
    <textarea id='comments' name='comments' rows='5'
       cols='40'></textarea>
```

For large, multi-line input, use a textarea. Any text between the begin/end tags is put inside the text area.

Web Forms

```
<label for='inquiryType'>Inquiry Type</label>
 <select id='inquiryType' name='inquiryType'>
     <option value='error'>Choose an option</option>
     <option value='prodInfo'>Product information</option>
     <option value='custSvc'>Customer service</option>
     <option value='returns'>Returns</option>
     <option value='other'>Other</option>
  </select>
 </fieldset>
```

Each option appears on its own line, value is what is submitted to the server for the name specified in the select.

Web Forms

```
<fieldset>
  <legend>Demographic information</legend>
  <fieldset>
    <legend>Gender</legend>
    <input type='radio' name='gender' id='male' value='M' />
    <label for='male'>Male</label>
    <input type='radio' name='gender' id='female' value='F' />
    <label for='female'>Female</label>
  </fieldset>
```

For type=radio, you use different ids, but the same name. Only the selected one within the name group will be submitted.

Web Forms

```
  <fieldset>
    <legend>Interests</legend>
    <input type='checkbox' name='interests[]' id='games' value='games' />
    <label for='games'>Games</label>
    <input type='checkbox' name='interests[]' id='reading' value='reading' />
    <label for='reading'>Reading</label>
    <input type='checkbox' name='interests[]' id='gardening' value='gardening' />
    <label for='gardening'>Gardening</label>
    <input type='checkbox' name='interests[]' id='sports' value='sports' />
  </fieldset>
 </fieldset>
 <input type='submit' value='Submit' />
 <input type='reset' value='Clear' />
</form>
```

Web Forms

```
  <fieldset>
    <legend>Interests</legend>
    <input type='checkbox' name='interests[]' id='games' value='games' />
    <label for='games'>Games</label>
    <input type='checkbox' name='interests[]' id='reading' value='reading' />
    <label for='reading'>Reading</label>
    <input type='checkbox' name='intere
    <label for='gardening'>Gardening</l
    <input type='checkbox' name='intere
  </fieldset>
 </fieldset>
 <input type='submit' value='Submit' />
 <input type='reset' value='Clear' />
</form>
```

For type=checkbox, you use different ids, but the same name. The name appears as an array (using []). This creates an array on the server.

Web Forms

```
  <fieldset>
    <legend>Interests</legend>
    <input type='checkbox' name='interests[]' id='games' value='games' />
    <label for='games'>Games</label>
    <input type='checkbox' name='interests[]' id='reading' value='reading' />
    <label for='reading'>Reading</la
    <input type='checkbox' name='in
    <label for='gardening'>Gardenin
    <input type='checkbox' name='interest                    orts' value='sports' />
  </fieldset>
</fieldset>
<input type='submit' value='Submit' />
<input type='reset' value='Clear' />
</form>
```

An input with type=submit creates a button, as does reset.

PHP Scripts for Form Data

- Can use $_GET, $_POST, or $_REQUEST arrays to access form data.
  - All are arrays with the key equal to the name given to the form element.
  - The values are strings from the data in the form.
  - Multiple-select form elements have array values
    - Multiple select combo-boxes
    - Checkboxes

PHP Scripts for Form Data

```
<!DOCTYPE html>
<html>
    <head>
        <title>Form Elements result</title>
    </head>
    <body>
        <h1>Form Elements result</h1>
        <?php echo dumpArray($_REQUEST); ?>
    </body>
</html>
```

PHP Scripts for Form Data

```
<?php
function dumpArray($elements) {
    $result = "<ol>\n";
    foreach ($elements as $key => $value) {
        if (is_array($value)) {
            $result .= "<li>Key <b>$key</b> is an array
                containing:" . dumpArray($value) . "</li>\n";
        } else {
            $value = nl2br(htmlspecialchars($value));
            $result .= "<li>Key <b>$key</b> has value
                <b>$value</b></li>\n";
        }
    }
    return $result . "</ol>\n";
}
?>
```

PHP Scripts for Form Data

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        } else {
            $value = nl2br(htmlspecialchars($v      ));
            $result .= "<li>Key <b>$key</b> ha
                <b>$value</b></li>\n";
        }
    }
    return $result . "</ol>\n";
}
?>
```

Recursion: A function calling itself. Similar to a loop, but has an implicit stopping case.

PHP Scripts for Form Data

```php
<?php
function dumpArray($elements) {
    $result = "<ol>\n";
    foreach ($elements as $key => $value) {
        if (is_array($value)) {
            $result .= "<li>Key <b>$key</b> is an array
                containing:" . dumpArray($value) . "</li>\n";
        } else {
            $value = nl2br(htmlspecialchars($value));
            $result .= "<li>Key <b>$key</b> ha alue
                <b>$value</b></li>\n";
        }
    }
    return $result . "</ol>\n";
}
?>
```

htmlspecialchars converts < into <, > into >, & into &, etc.

PHP Scripts for Form Data

```
<?php
function dumpArray($elements) {
    $result = "<ol>\n";
    foreach ($elements as $key => $value) {
        if (is_array($value)) {
            $result .= "<li>Key <b>$key</b> is an array
                containing:" . dumpArray($value) . "</li>\n";
        } else {
            $value = nl2br(htmlspecialchars($value));
            $result .= "<li>Key <b>$key</b> has value
                <b>$value</b></li>\n";
        }
    }
    return $result . "</ol>\n";
}
?>
```

nl2br converts newlines into
 so that text areas maintain their line breaks.

PHP Scripts for Form Data

```
<?php
function dumpArray($elements) {
    $result = "<ol>\n";
    foreach ($elements as $key
        if (is_array($value)) {
            $result .= "<li>Key <b>$
                containing:" . dumpA
        } else {
            $value = nl2br(htmlspe
            $result .= "<li>Key <b>$
                <b>$value</b></li>\n
        }
    }
    return $result . "</ol>\n";
}
?>
```

Form Elements result

1. Key **firstName** has value **Bill**
2. Key **lastName** has value **Jones**
3. Key **comments** has value **This is my comment that stretches over two lines.**
4. Key **inquiryType** has value **customerService**
5. Key **gender** has value **M**
6. Key **interests** is an array containing:
    1. Key **0** has value **reading**
    2. Key **1** has value **sports**

PHP Scripts for Form Data

- Caveats
  - The previous code dumped out the entire request, which is rarely what you want to do.
  - If you are looking for a specific value, you should use isset() to see if it was submitted.

PHP Scripts for Form Data

```
function safeGet($array, $key, $default=false) {
    if (isset($array[$key])) {
        $value = $array[$key];
        if (!is_array($value)) {
            $value = htmlspecialchars(trim($array[$key]));
        }
        if ($value) {
            return $value;
        }
    }
    return $default;
}
$interests = safeGet($_REQUEST, 'interests');
$firstName = safeGet($_REQUEST, 'firstName');
```

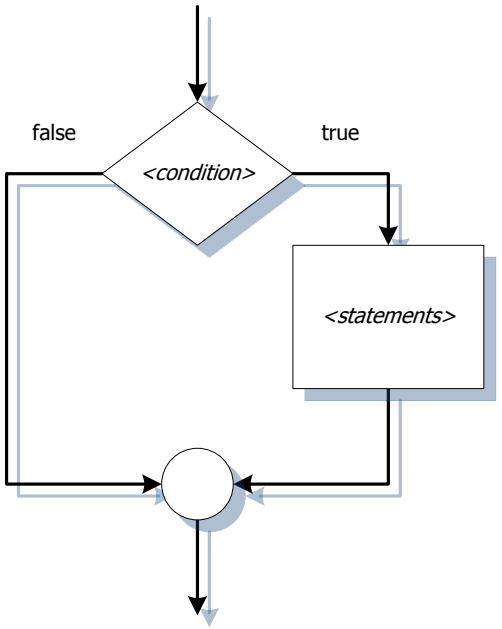
Control Statements

- Control statements alter the flow of a program from straight line to conditional or repeated
  - If/else statements
  - Switch statements
  - For loops
  - Foreach loops
  - While loops
  - Do/while loops

if/else Statements

- Keywords if and else implement conditional execution

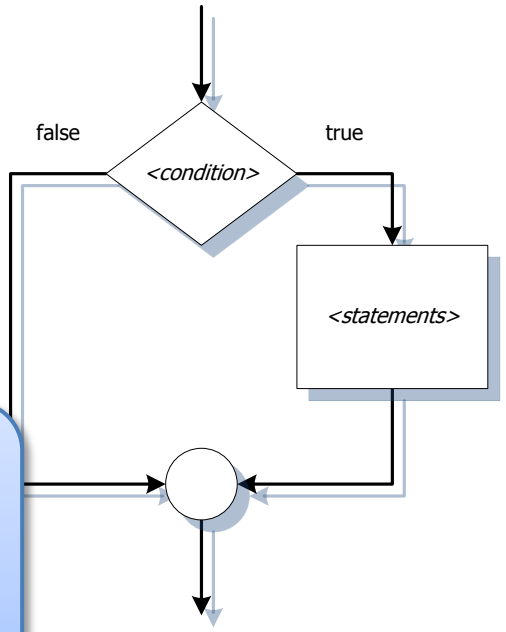
```
if (<condition>) {
    <statements>
}
```



if/else Statements

- Keywords if and else implement conditional execution

```
if (<condition>) {
    <statements>
}
```

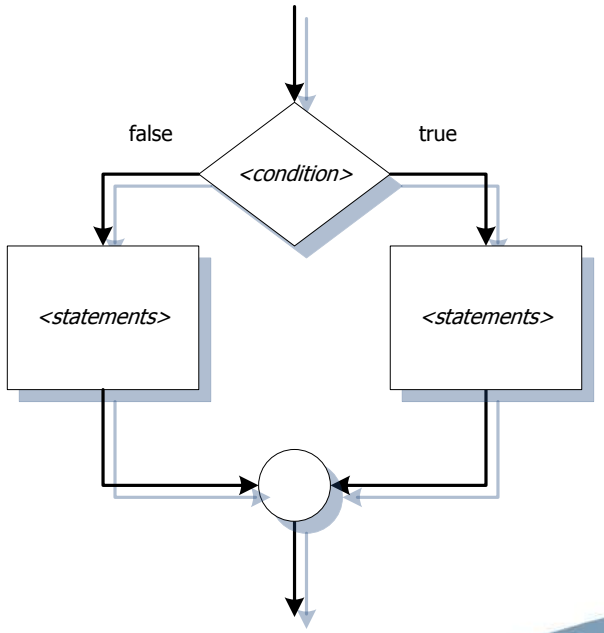


condition should be a boolean expression (after type juggling).

if/else Statements

- Keywords if and else implement conditional execution

```
if (<condition>) {
    <statements>
} else {
    <statements>
}
```



switch Statements

- Switch statements
  - A shortcut to compare many values and conditionally execute code based strictly on *equality*.
    - *Good* for a limited number of enumerable options.
    - *Bad* for testing ranges of values, deciding between two mutually exclusive options.

switch Statements

- Switch statements – suitability

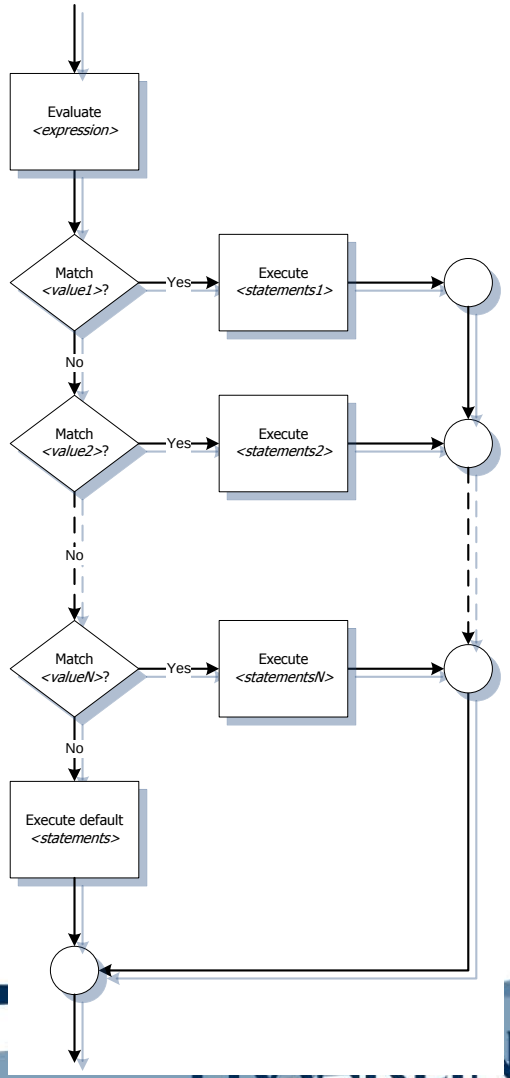
Example	If/else or switch?
Determining point values of letter grades.	
Determining letter grades from a percentage.	
Determining insurance rates based on age.	
Determine the name of a month based on a month number.	
Determine form letter salutation based on gender.	

switch Statements

- Switch statements

```
switch (<expression>) {
    case <value1>:
        <statements1>;
        break;
    case <value2>:
        <statements2>;
        break;
    //...
    case <valueN>:
        <statements2>;
        break;
    default:
        <statements>;
        break;
}
```

What if “break” is missing?

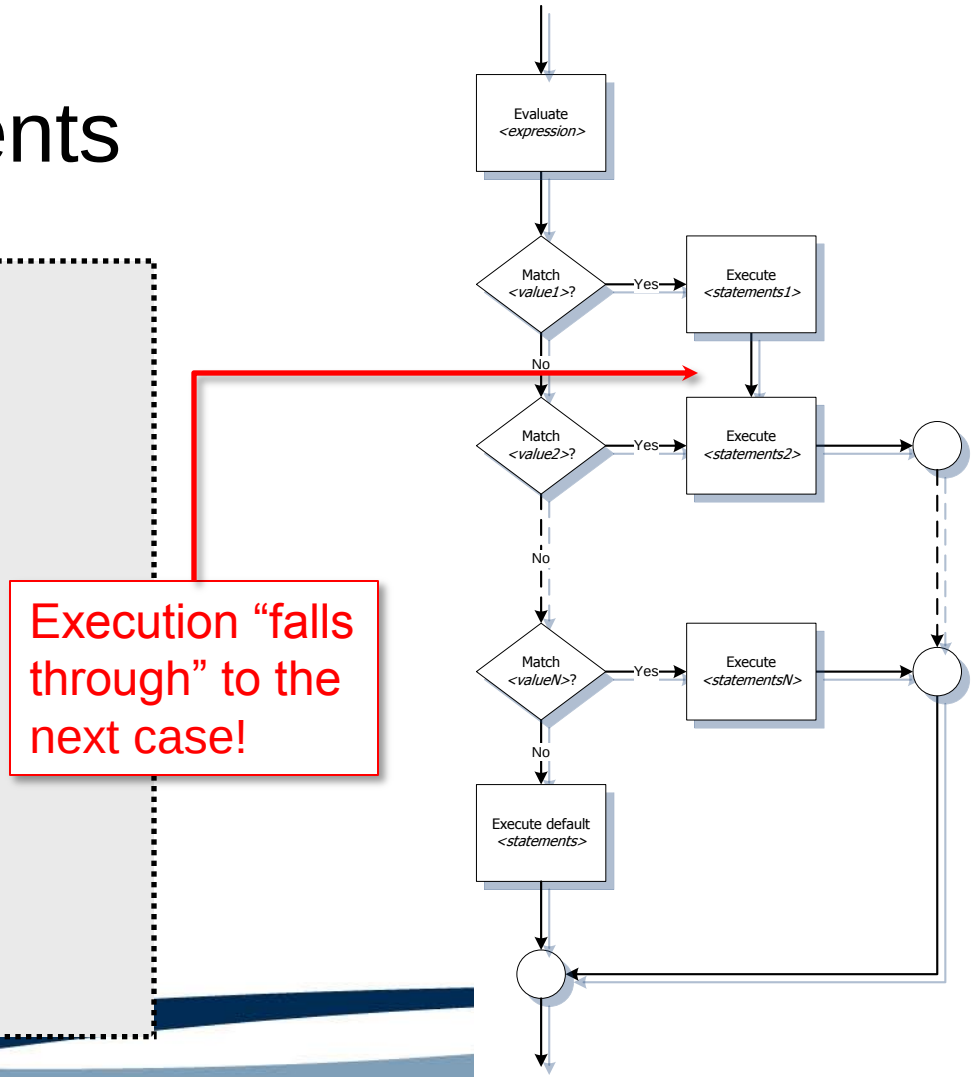


switch Statements

- Switch statements

```
switch (<expression>) {
    case <value1>:
        <statements1>;

    case <value2>:
        <statements2>;
        break;
    //...
    case <valueN>:
        <statements2>;
        break;
    default:
        <statements>;
        break;
}
```

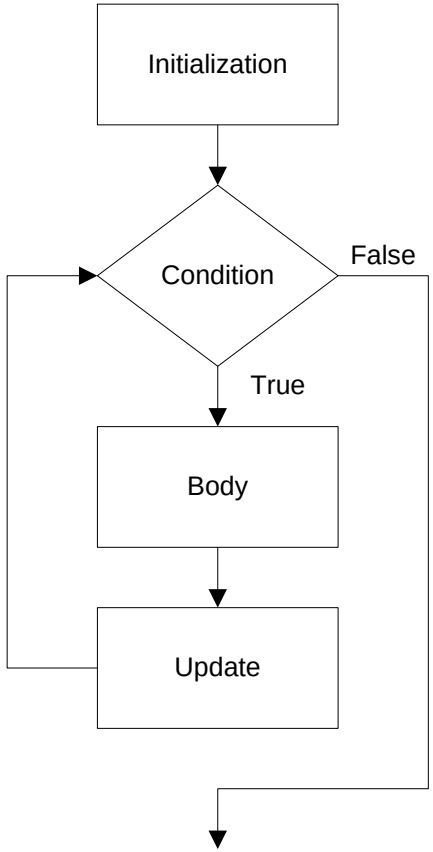


Repetition

- Four parts to every loop
  - Initialization
  - Continuation condition
  - Body
  - Update

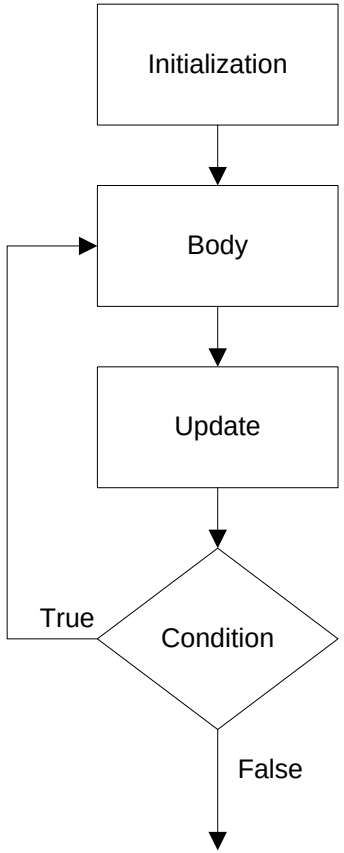
Repetition

- Pre-test loops
  - Condition is evaluated before the body of the loop is executed.
  - Key idea: body may not ever execute.



Repetition

- Post-test loops
  - Condition is evaluated after the body of the loop is executed.
  - Key idea: body always executes at least once



while loops

- While loops:
  - Pre-test loop syntax

```
while (condition) {
    body_statements;
}
```

All that is really required. But, which of the four parts are missing?

while loops

- While loops:
  - Pre-test loop syntax

```
initialization;
while (condition) {
    body_statements;
    update_statement;
}
```

for loops

- For loops:
  - Pre-test loop syntax

```
for (initialization; condition; update) {
        body_statements;
}
```

for loops

- For loops:
  - Pre-test loop syntax

```
for (initialization; condition; update) {
        body_statements;
}
```

Equivalent to:

```
initialization;
while (condition) {
  body_statements;
  update;
}
```

for vs. while loops

- When to use for vs. while
  - Equivalent at runtime
  - while loops are a little more flexible (i.e. the update step can be conditional or in the middle of the body)
  - for loops are generally used for counting (i.e. the bounds are known)

do…while loops

- do…while loops:
  - Post-test loop syntax

```
do {
    body_statements;
} while (condition);
```

```
initialization;
do {
    body_statements;
    update;
} while (condition);
```

do…while loops

- do…while loops:
  - Post-test loop syntax

```
do {
    body_statements;
} while (condition);
```

Required elements.

```
initialization;
do {
    body_statements;
    update;
} while (condition);
```

All 4 elements.

do…while loops

- Post-test loops
  - Body always guaranteed to execute at least once.
  - But, we could still copy-and-paste the body above a pre-test loop and achieve the same results.

foreach/as loops

- Specifically designed to solve the problem of iterating through *every* element of an array.

```
foreach ($array_var as $value) {
    do_something;
}
```

```
foreach ($array_var as $key => $value) {
    do_something;
}
```

foreach/as loops

- Specifically designed to solve the problem of iterating through *every* element of an array.

```
foreach ($array_var as $value) {
    do_something;
}
```

```
foreach ($array_var as $key => $value) {
    do_something;
}
```

Assigns values from the array into $value each trip through the loop.

foreach/as loops

- Specifically designed to solve the problem of iterating through *every* element of an array

Assigns the index into $key and the value into $value each trip through the loop.

```
alue) {
```

```
foreach ($array_var as $key => $value) {
    do_something;
}
```

foreach/as loops

- Example:

```
$alphabet = array(
   'a' => 'apple',
   'b' => 'banana',
   'c' => 'carrot'
);

foreach ($alphabet as $value) {
    print "$value<br />";
}

foreach ($alphabet as $key => $value) {
    print "$key is for $value<br />";
}
```

Prints:

apple
banana
carrot

foreach/as loops

- Example:

```
$alphabet = array(
   'a' => 'apple',
   'b' => 'banana',
   'c' => 'carrot'
);

foreach ($alphabet as $value) {
    print "$value<br />";
}

foreach ($alphabet as $key => $value) {
    print "$key is for $value<br />";
}
```

Prints:

a is for apple
b is for banana
c is for carrot

foreach/as loops

- Example:

```
$alphabet = array(
   'a' => 'apple',
   'b' => 'banana',
   'c' => 'carrot'
);

foreach ($alphabet as $value) {
    print "$value<br />";
}

foreach ($alphabet as $key => $value) {
    print "$key is for $value<br />";
}
```

If $alphabet is not an associative array, the keys will be numeric, numbered [0, *n*-1], where *n* is the length of the array as determined by sizeof() or count().

foreach/as loops

- Ex: roll 2 dice many times. Find probabilities.

```
function probability($count=10000) {
    $rolls = array();
    for ($i = 2; $i <= 12; ++$i) {
        $rolls[$i] = 0;
    }
    for ($i = 0; $i < $count; ++$i) {
        $die1 = mt_rand(1, 6);
        $die2 = mt_rand(1, 6);
        $rolls[$die1 + $die2]++;
    }
    foreach ($rolls as $die => $times) {
        print "$die was rolled $times times, for a
        probability of ". $times/$count * 100 . "%.";
    }
}
```

foreach/as loops

- Ex: roll 2 dice m

```
function probability($count
    $rolls = array();
    for ($i = 2; $i <= 12; ++$
        $rolls[$i] = 0;
    }
    for ($i = 0; $i <      nt; +
                          s)


                        => $times) {
                          $times times, for a
        probability of ". $times/$count * 100 . "%.";
    }
}
```

2 was rolled 262 times, for a probability of 2.62%.
3 was rolled 557 times, for a probability of 5.57%.
4 was rolled 847 times, for a probability of 8.47%.
5 was rolled 1183 times, for a probability of 11.83%.
6 was rolled 1332 times, for a probability of 13.32%.
7 was rolled 1658 times, for a probability of 16.58%.
8 was rolled 1333 times, for a probability of 13.33%.
9 was rolled 1132 times, for a probability of 11.32%.
10 was rolled 834 times, for a probability of 8.34%.
11 was rolled 579 times, for a probability of 5.79%.
12 was rolled 283 times, for a probability of 2.83%.

Real probability of rolling a 7 is 6 in 36, or 16.67%.

Upcoming Deadlines

- Readings for next week
  - Chapters 9 and 10 in *PHP and MySQL*
- Assignments
  - Homework 3 due end of week 4
  - Lab 2 due end of week 7
- Next week:
  - Strings, numbers, and dates

General Q & A

- Questions?
- Comments?
- Concerns?

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