INFO 151 Web Systems and Services

Week 8 (T1)

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Overview

- In this tutorial we will introduce:
 - The PHP syntax with the similarities and differences between JavaScript and PHP
 - Selection (conditional statements) including:
 - if / if...else / if...elseif...else statements
 - switch statements
 - Catching runtime errors
 - Passing data between JavaScript and PHP
- There are similarities and differences between JavaScript and PHP
 - The differences are mainly in the language syntax
 - Using the incorrect syntax will produce errors which are hard to find

Selection (Conditional) Statements

Selection Operators

- JavaScript and PHP implement the same selection operators (conditions and branches)
 - if
 - If...else
 - If...else if...else
 - switch
- In the following slides we demonstrate
 - The selection operators in simple applications
 - The syntax with the differences between JavaScript and PHP

if Selection Statements

if Statements

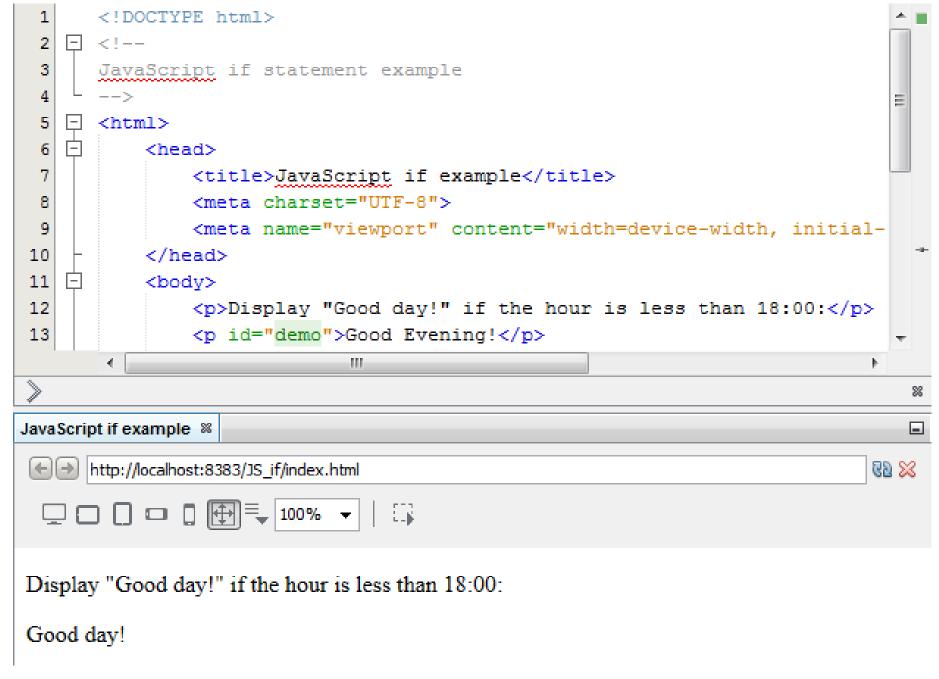
JavaScript if statement

```
if (condition) {
    block of code to be executed if the
    condition is true
}
```

PHP if statement

```
if (condition) {
    code to be executed if condition is true;
}
```

```
<!DOCTYPE html>
   □ <!--</p>
     JavaScript if statement example
     -->
     <html>
         <head>
             <title>JavaScript if example</title>
             <meta charset="UTF-8">
             <meta name="viewport" content="width=device-width, initial-scale=1.0">
10
         </head>
11
         <body>
12
             Display "Good day!" if the hour is less than 18:00:
13
             Good Evening!
14
             <script>
15
                  if (new Date().getHours() < 18) {</pre>
16
                      document.getElementById("demo").innerHTML = "Good day!";
17
18
             </script>
         </body>
19
     </html>
20
21
22
```



```
<!DOCTYPE html>
   □ <!--
 2
      PHO if selection example
      -->
5
      <html>
6
          <head>
              <meta charset="UTF-8">
              <title>if selection example</title>
          </head>
          <body>
10
11
              <?php
                   $t = date("H");
12
                   if ($t < "20") {
13
14
                       echo "Have a good day!";
15
16
              ?>
          </body>
17
18
      </html>
19
```



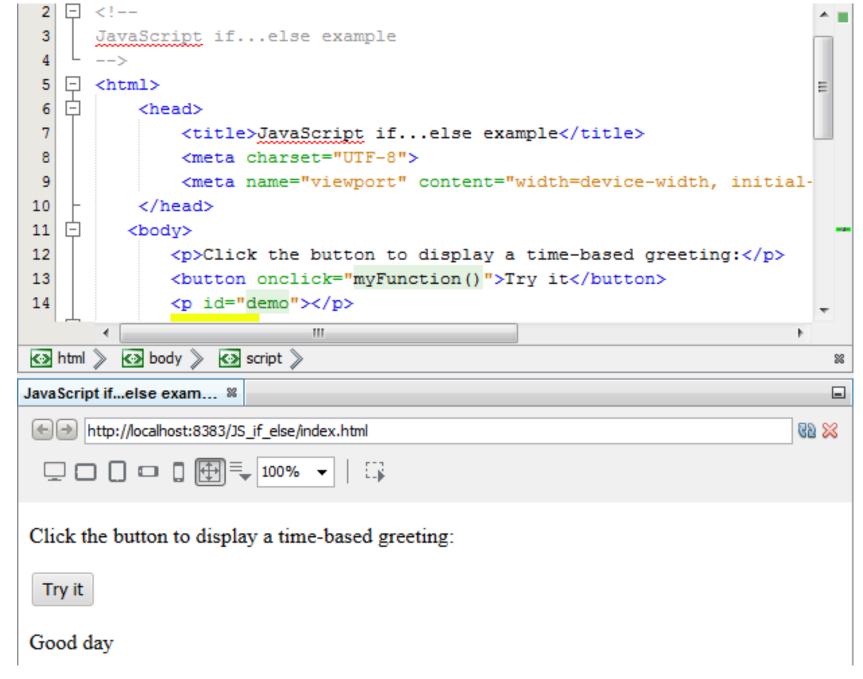
if...else Selection Statements

If...else Statements

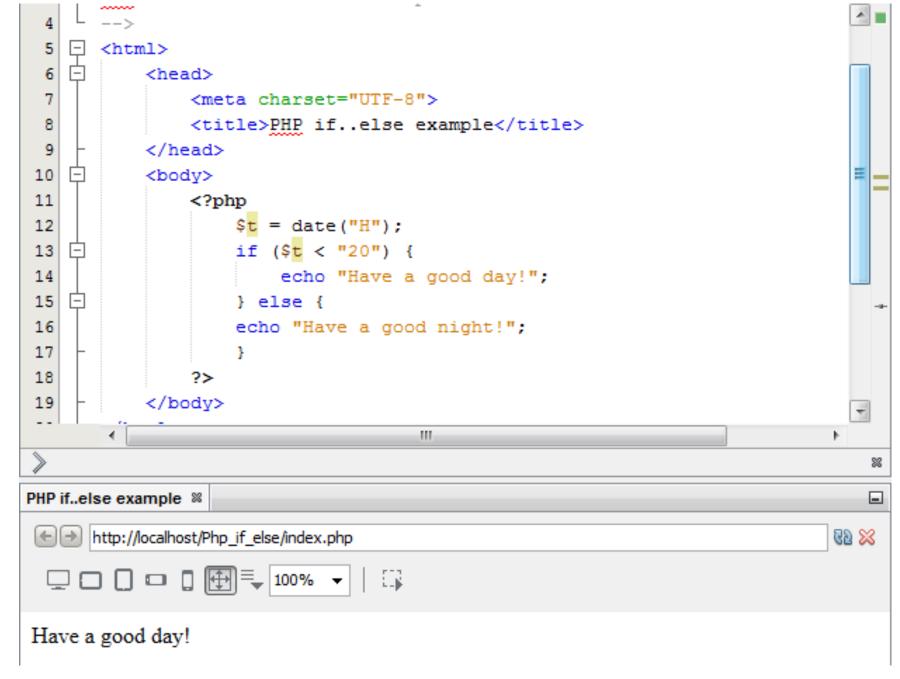
JavaScript

```
if (condition) {
           block of code to be executed if the condition is true
     } else {
          block of code to be executed if the condition is false
PHP
     if (condition) {
            code to be executed if condition is true;
     } else {
           code to be executed if condition is false;
```

```
<!--
     JavaScript if...else example
     -->
     <html>
  \Box
         <head>
             <title>JavaScript if...else example</title>
             <meta charset="UTF-8">
             <meta name="viewport" content="width=device-width, initial-scale=1.0">
10
         </head>
11
        <body>
12
            Click the button to display a time-based greeting:
13
            <button onclick="myFunction()">Try it</button>
14
            15
            <script>
16
                function myFunction() {
17
                    var hour = new Date().getHours();
18
                    var greeting;
19
                    if (hour < 18) {
20
                        greeting = "Good day";
                    } else {
22
                        greeting = "Good evening";
23
24
                    document.getElementById("demo").innerHTML = greeting;
25
             </script>
     </body>
28
     </html>
29
```



```
<!DOCTYPE html>
 2
     <!--
      PHP if...else statement example
 3
      -->
 5
      <html>
 6
          <head>
              <meta charset="UTF-8">
              <title>PHP if..else example</title>
 8
 9
          </head>
10
          <body>
              <?php
12
                   $t = date("H");
                   if ($t < "20") {
13
14
                       echo "Have a good day!";
15
                   } else {
16
                   echo "Have a good night!";
18
               ?>
19
          </body>
      </html>
20
```



If...elseif...else Selection Statements

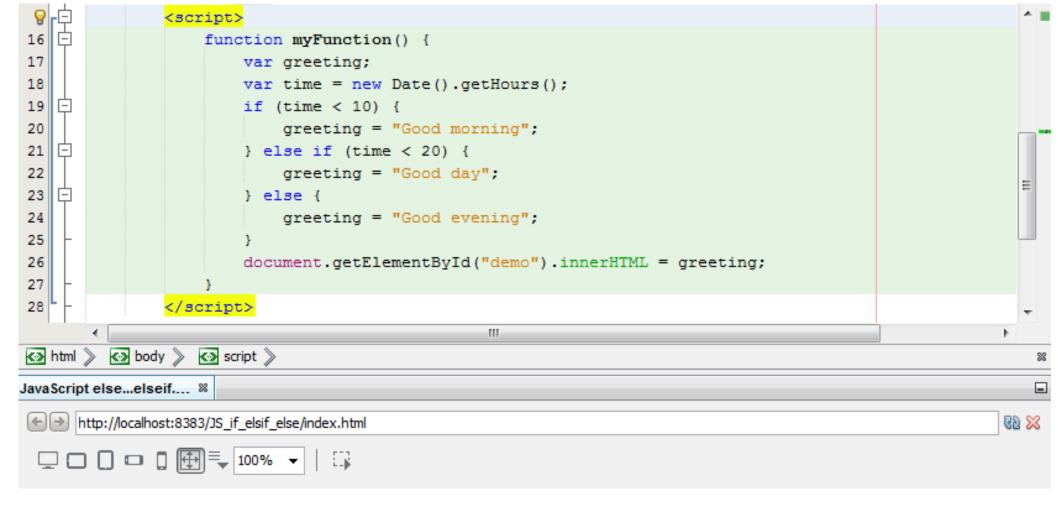
JavaScript if...elseif...else Statements

```
if (condition1) {
    block of code to be executed if condition1 is
    true
} else if (condition2) {
    block of code to be executed if the condition1
    is false and condition2 is true
} else {
    block of code to be executed if the condition1
    is false and condition2 is false
```

PHP if...elseif...elseStatements

```
if (condition) {
    code to be executed if this condition is true;
} elseif (condition) {
    code to be executed if this condition is true;
} else {
    code to be executed if all conditions are
    false;
```

```
무
     <html>
         <head>
             <title>JavaScript else...elseif...else example</title>
             <meta charset="UTF-8">
             <meta name="viewport" content="width=device-width, initial-scale=1.0">
10
         </head>
  11
         <body>
12
             Click the button to get a time-based greeting:
13
             <button onclick="myFunction()">Try it</button>
             14
             <script>
                 function myFunction() {
16
17
                     var greeting;
18
                     var time = new Date().getHours();
   19
                     if (time < 10) {
20
                         greeting = "Good morning";
21
   } else if (time < 20) {
22
                         greeting = "Good day";
23
   _
                     } else {
24
                         greeting = "Good evening";
25
26
                     document.getElementById("demo").innerHTML = greeting;
27
28
             </script>
         </body>
29
30
     </html>
31
```

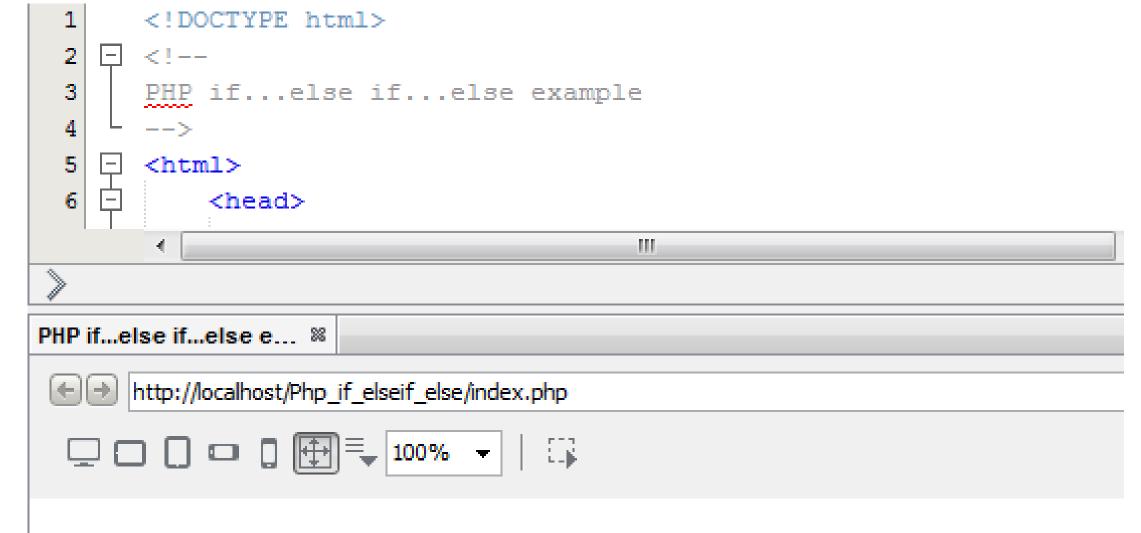


Click the button to get a time-based greeting:

Try it

Good day

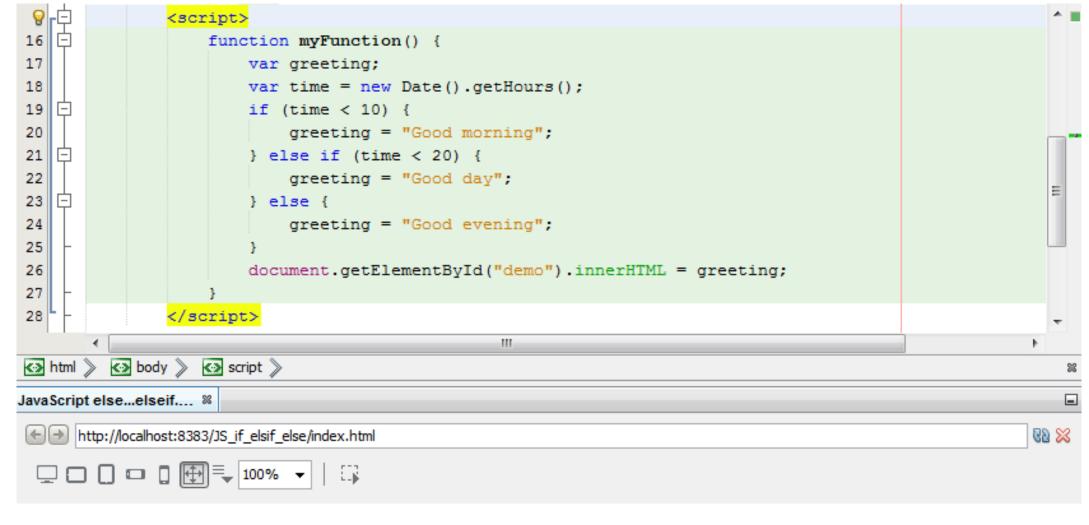
```
<!DOCTYPE html>
   □ <!--</p>
      PHP if...else if...else example
 3
      -->
      <html>
   白
          <head>
              <meta charset="UTF-8">
              <title>PHP if...else if...else example</title>
 9
          </head>
8
          <body>
              <?php
12
                  $t = date("H");
                  echo "The hour (of the server) is " . $t;
13
14
                  echo ", and will give the following message:";
15
                  if ($t < "10") {
16
                       echo "Have a good morning!";
                   } elseif ($t < "20") {
   17
18
                       echo "Have a good day!";
19
                   } else {
20
                       echo "Have a good night!";
22
              ?>
23
          </body>
24
      </html>
25
26
```



The hour (of the server) is 19, and will give the following message:

Have a good day!

```
<html>
         <head>
             <title>JavaScript else...elseif...else example</title>
             <meta charset="UTF-8">
             <meta name="viewport" content="width=device-width, initial-scale=1.0">
10
         </head>
11
         <body>
12
             Click the button to get a time-based greeting:
13
             <button onclick="myFunction()">Try it</button>
             14
             <script>
16
                  function myFunction() {
17
                     var greeting;
18
                     var time = new Date().getHours();
19
                     if (time < 10) {
20
                         greeting = "Good morning";
21
                      } else if (time < 20) {
22
                         greeting = "Good day";
23
                      } else {
24
                         greeting = "Good evening";
25
26
                      document.getElementById("demo").innerHTML = greeting;
27
28
             </script>
29
         </body>
30
     </html>
31
```

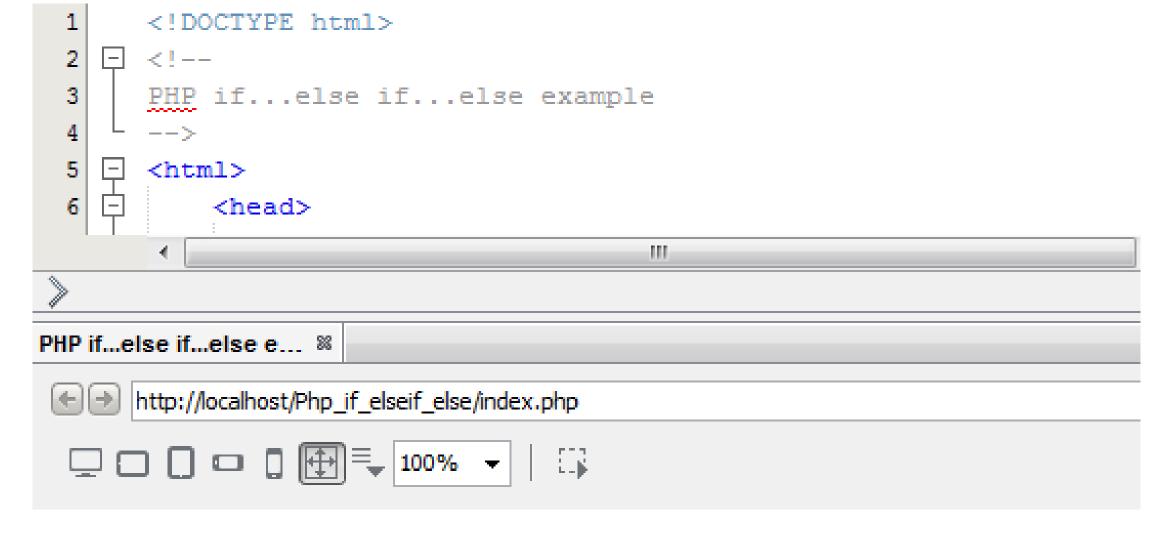


Click the button to get a time-based greeting:

Try it

Good day

```
<!DOCTYPE html>
   □ <!--</p>
      PHP if...else if...else example
     -->
     <html>
          <head>
              <meta charset="UTF-8">
              <title>PHP if...else if...else example</title>
 8
          </head>
9
          <body>
11
              <?php
12
                  $t = date("H");
13
                  echo "The hour (of the server) is " . $t;
                  echo ", and will give the following message:";
14
   if ($t < "10") {
15
16
                      echo "Have a good morning!";
17
   } elseif ($t < "20") {
18
                      echo "Have a good day!";
1.9
   Ξ
                  } else {
2.0
                      echo "Have a good night!";
21
22
              ?>
23
          </body>
      </html>
24
25
20
```



The hour (of the server) is 19, and will give the following message:

Have a good day!

switch Selection Statements

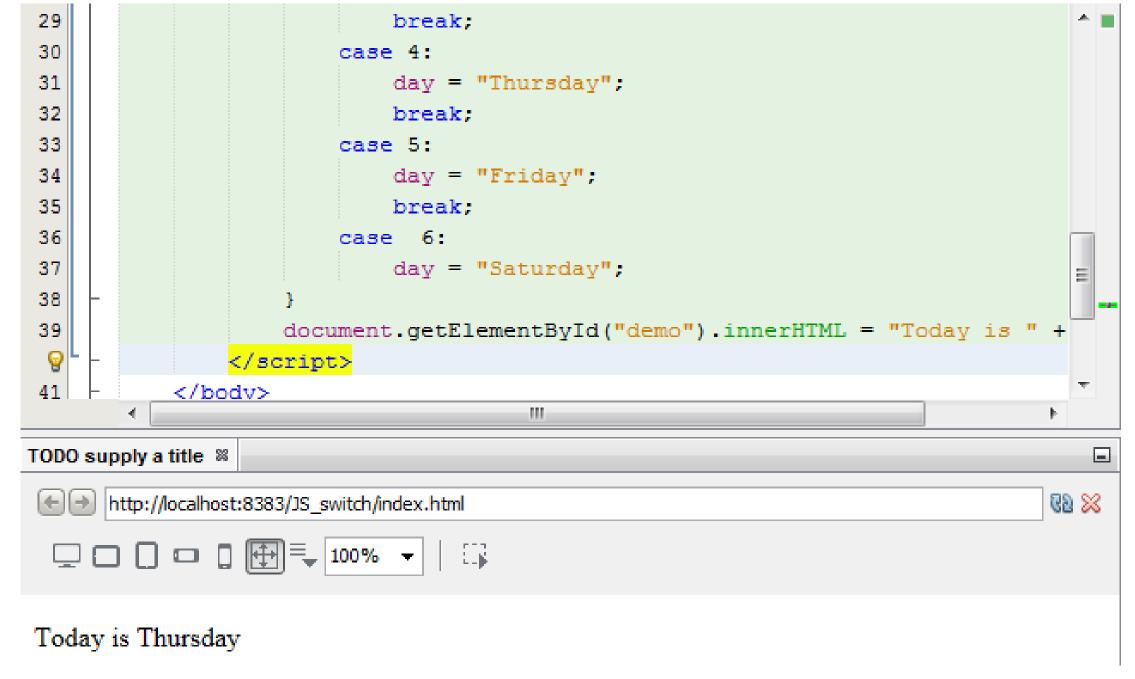
JavaScript switch...case Operators

```
switch(expression) {
    case n:
        code block
        break;
    case n:
        code block
        break;
    default:
        code block
```

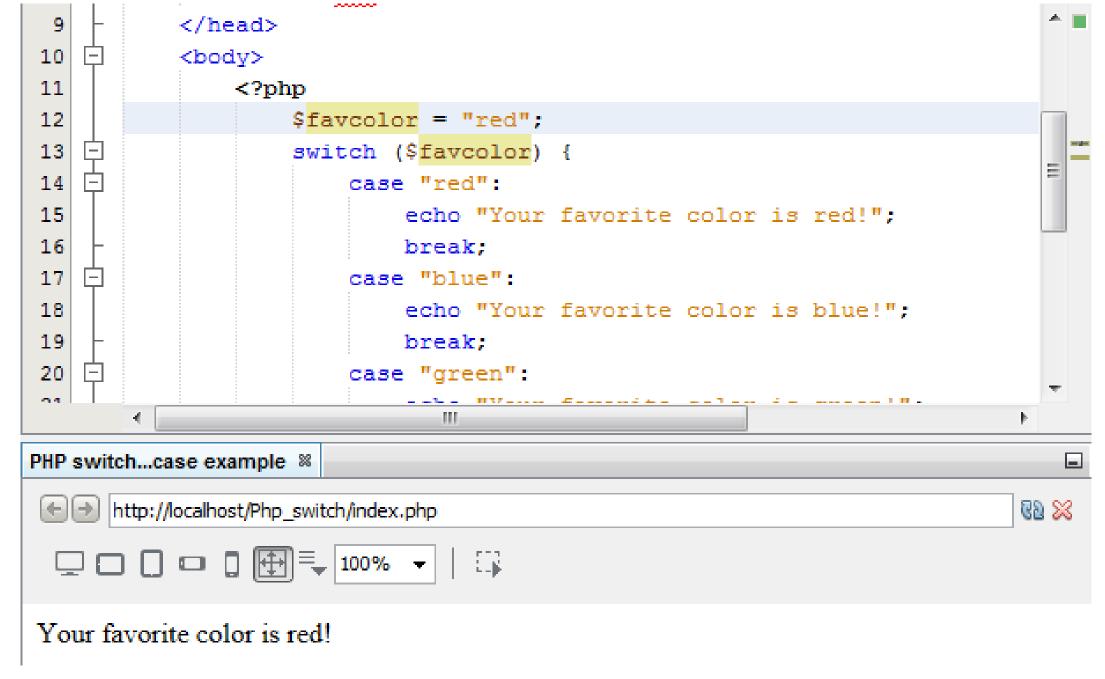
PHP switch...case Operators

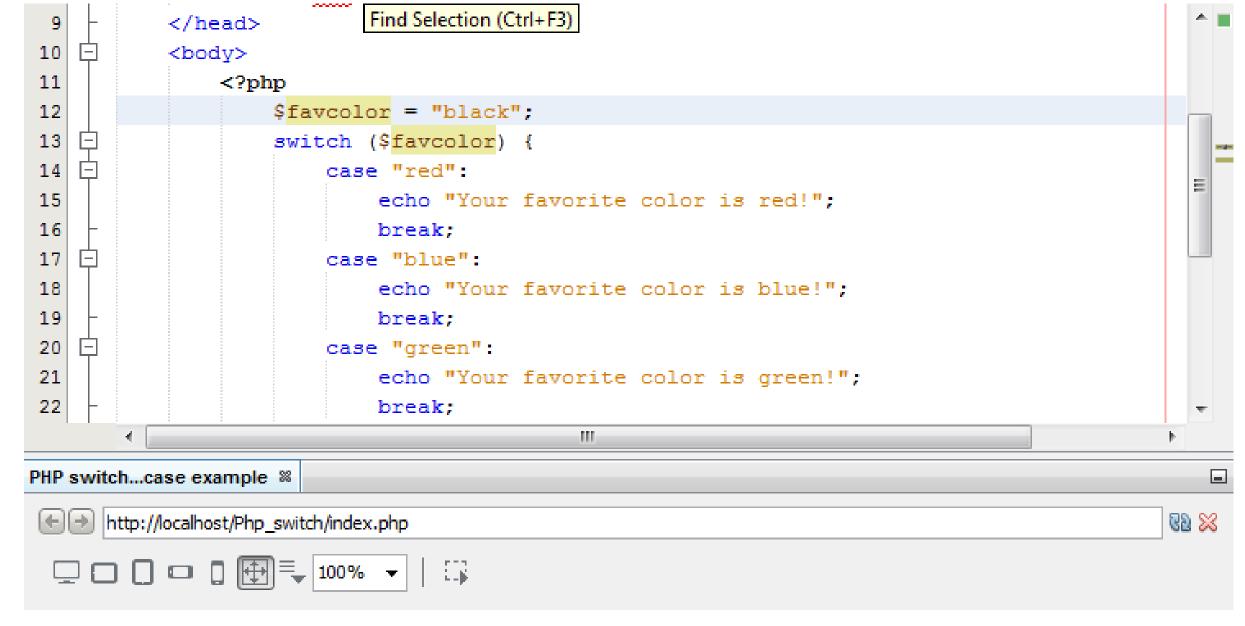
```
switch (n) {
    case label1:
        code to be executed if n=label1;
        break;
    case label2:
        code to be executed if n=label2;
        break;
    case label3:
        code to be executed if n=label3;
        break;
    • • •
    default:
        code to be executed if n is different from all
labels;
```

```
13
          <body>
14
              <script>
15
16
                  var day;
17
                  switch (new Date().getDay()) {
18
                      case 0:
19
                          day = "Sunday";
20
                          break;
21
                      case 1:
                          day = "Monday";
23
                          break;
                      case 2:
25
                          day = "Tuesday";
26
                          break;
                      case 3:
28
                          day = "Wednesday";
29
                          break;
30
                      case 4:
31
                          day = "Thursday";
                          break;
33
                      case 5:
34
                          day = "Friday";
35
                          break:
36
                      case 6:
                          day = "Saturday";
37
38
39
                  document.getElementById("demo").innerHTML = "Today is " + day;
              </script>
          </body>
      </html>
```



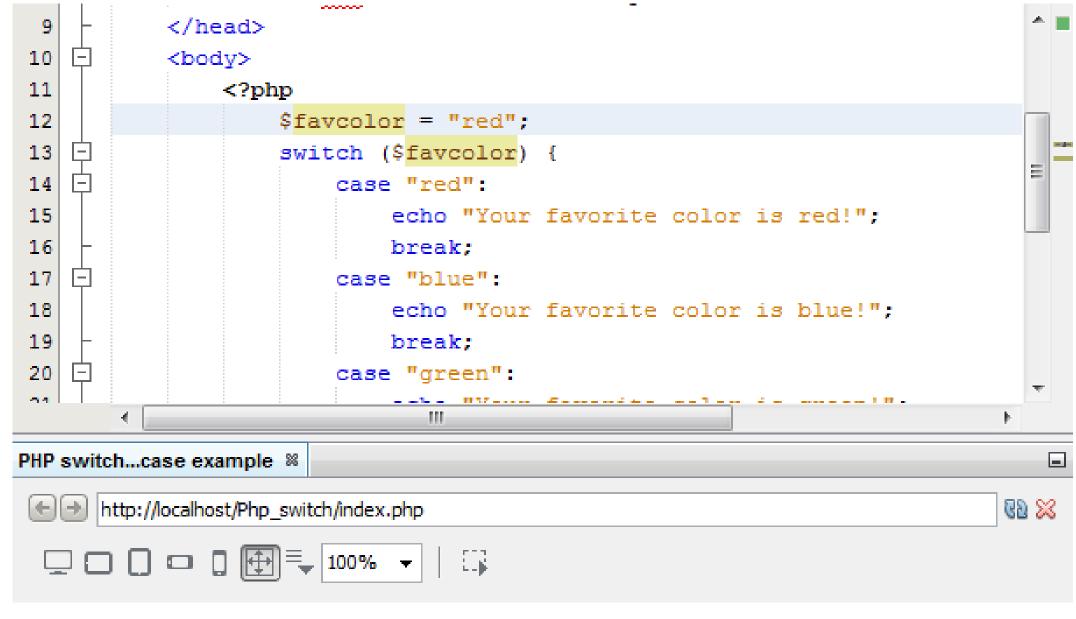
```
<!DOCTYPE html>
   □ <!--
 3
      PHP switch...case example
    ___>
     <html>
 6
          <head>
 7
             <meta charset="UTF-8">
 8
              <title>PHP switch...case example</title>
          </head>
          <body>
11
              <?php
                  $favcolor = "red";
12
13 🖹
                  switch ($favcolor) {
   阜
14
                      case "red":
15
                          echo "Your favorite color is red!";
16
                          break:
17
   阜
                      case "blue":
18
                          echo "Your favorite color is blue!";
19
                          break;
20
                      case "green":
21
                          echo "Your favorite color is green!";
22
                          break;
23
                      default:
24
                          echo "Your favorite color is neither red, blue, nor green!";
25
26
              ?>
27
          </body>
     </html>
29
```



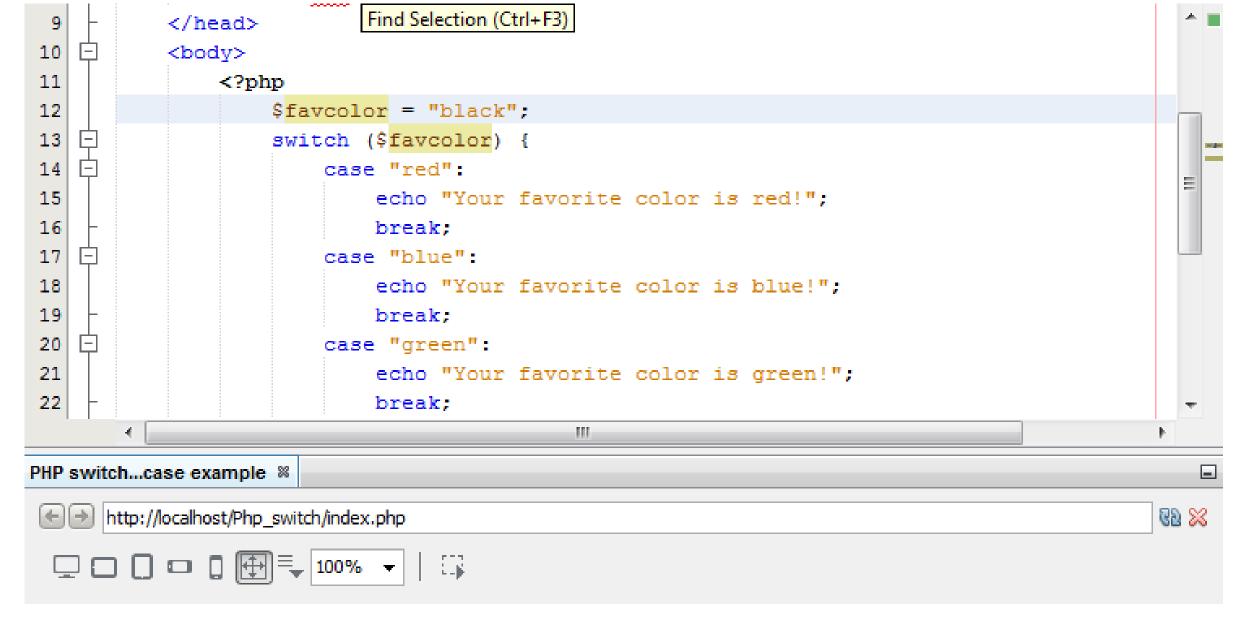


Your favorite color is neither red, blue, nor green!

```
<!DOCTYPE html>
   □ <!--
      PHP switch...case example
    L -->
     <html>
          <head>
              <meta charset="UTF-8">
              <title>PHP switch...case example</title>
          </head>
          <body>
              <?php
                  $favcolor = "red";
12
13
   皇皇
                  switch ($favcolor) {
14
                      case "red":
15
                          echo "Your favorite color is red!";
16
                          break;
17
   case "blue":
18
                          echo "Your favorite color is blue!";
19
                          break;
20
                      case "green":
21
                          echo "Your favorite color is green!";
                          break:
22
                      default:
24
                          echo "Your favorite color is neither red, blue, nor green!";
25
26
              ?>
          </body>
      </html>
```



Your favorite color is red!



Your favorite color is neither red, blue, nor green!

Runtime Errors

Catching Runtime Errors

- When executing JavaScript or PHP program code different runtime errors can occur
 - errors include
 - Fail to connect to the database
 - Fail to run the SQL statement
 - Invalid input by a user (including criminal attempts to access a database)
 - Runtime errors (network issues of server down)
- To catch errors use:
 - The try statement tests a block of code for runtime errors
 - The catch statement handles the runtime error
 - The **throw** statement creates custom errors
 - The finally statement execute JavaScript program code after the try and catch methods regardless of the result

Try...catch block

- The try statement defines a block of code to be tested for errors while it is being executed (at runtime)
- The catch statement defines a block of code to be executed if an error occurs in the try block.
- The statements try and catch come in pairs

```
try {
    Block of code to try
}
catch(err) {
    Block of code to handle errors
}
```

JavaScript try...catch...finally block

• The syntax for a try...catch..finally block try { statements catch (arguments) { finally { statements

```
9
             <meta name="viewport" content="width=device-width, initial-scale=1.0">
10
         </head>
11
        <body>
   12
            Please input a number between 5 and 10:
13
            <input id="demo" type="text">
            <button type="button" onclick="myFunction()">Test Input
14
15
            16
            <script>
17
                function myFunction() {
18
                    var message, x;
19
                    message = document.getElementById("p01");
20
                    message.innerHTML = "";
                    x = document.getElementById("demo").value;
22
                    try {
                        if (x == "") throw "is empty";
                        if(isNaN(x)) throw "is not a number";
25
                        x = Number(x);
26
                        if (x > 10) throw "is too high";
27
                        if (x < 5) throw "is too low";
28
                                                                                   The value is set to
29
                    catch(err) {
                                                                                   an empty string
30
                        message.innerHTML = "Input " + err;
31
32
                    finally {
                        document.getElementById("demo").value = 4";
33
34
35
36
             </script>
37
         </body>
38
     </html>
```

PHP try...catch...finally block

```
<?php
     //try block
     try {
          //code that can throw exception
     //catch block
     catch (Exception $e) {
          //code to print exception caught in the block
     //finally block
     finally {
          //any code that will always execute
?>
```

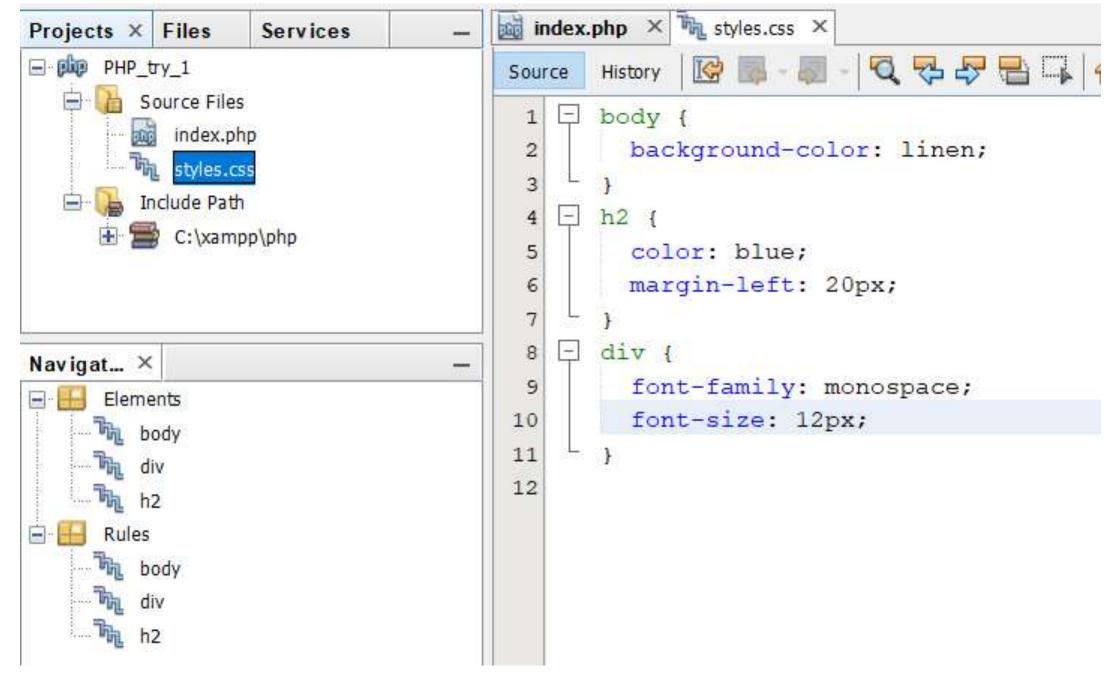
PHP try...catch...finally block

- In the following slide consider the PHP script:
 - Lines: 22 25
 - Here we are trying to connect to a MySQL database
 - We may use a try...catch...finally block to attempt to make a connection
 - Test for any errors (e.g., fail to connect to the database)
 - Output an error message if the connection failed
 - A successful connection would result in the PHP code in line 26 (confirm connection)
 - Lines 30 40
 - Here we are trying to retrieve data from a MySQL database
 - We may use a try...catch...finally block to attempt access the database and retrieve the data specified in the SQL structured query
 - Test for any errors (e.g., fail to retrieve the data)
 - Output an error message if the data request failed
 - Successful retrieval would result in the PHP code in lines 41-43 (the retrieval achieved)

```
15
              <?php
16
              $dbhost = 'localhost:3306'; $dbuser = 'philip';
17
              $dbpass = 'philip'; $db = 'test';
                                                                               The test database
              //SQL statements: $sql and $sqla_
18
                                                                               used in the example
19
              $sql = 'SELECT id, f name, s name, email FROM contacts';
              $sqla = 'SELECT * FROM contacts';
20
                                                                               PHP script
              //connect MySQL database
22
              $conn = mysqli connect($dbhost, $dbuser, $dbpass);
                                                                               SQL statements
23
   if(!$conn) {
                                                                               $sql / $sqla
24
                  Die error('Connection failed!: '.mysqli errno());
25
              echo 'Database connected <br>';
26
27
             mysqli_select db($conn, $db);
28
              echo 'database selected: ' .$db.'<br>';
                                                                               SQL statement
              echo ($sqla.'<br>'.'-----<br>');
29
              $retval = mysqli query($conn, $sqla);
30
                                                                               used $sqla
   31
              if(!$retval) {
32
                  die('Could not get data');
33
34
              while($row = mysqli fetch assoc($retval)) {
                  echo "id: {$row['id']}<br>".
35
                        "f name: {$row['f name']}<br>".
36
                        "s name: {$row['s name']}<br>".
37
                        "email: {$row['email']}<br>".
38
39
40
41
              mysqli free result($retval);
              echo "fetched data successfully\n";
42
43
             mysqli close($conn);
44
              ?>
```

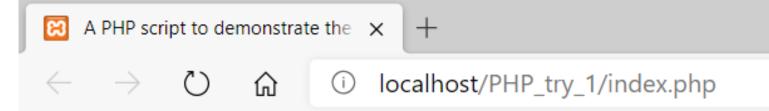
Two worked Examples of try...catch...finally blocks in PHP

Example One



```
<!DOCTYPE html>
     <!--
 3
      PHP program: PHP try 1
      A PHP script to demonstrate the try...catch...finally block
      The program tests a number and outputs a correct result or an error message
      Author: Philip Moore
      -->
      <html>
          <head>
              <meta charset="UTF-8">
10
              <title>A PHP script to demonstrate the try...catch...finally bloc</title>
11
             <link rel="stylesheet" href="styles.css">
12
          </head>
13
14
          <body>
15
              <div>
                  <h2>
16
                      A PHP script to demonstrate the try...catch...finally block <br>
17
                      The program tests a number and outputs a correct result or an error message
18
19
                  </h2>
              </div>
20
21
              <?php
```

```
<?php
                  //user-defined function with an exception
22
                  function checkNumber ($num) {
23
24
                      if($num>=2) {
25
                           //throw an exception
26
                           throw new Exception ("<br>Value must be less than 2");
27
                       return true;
28
29
                  //trigger an exception in a "try" block
30
31
                  try {
                      $n1 = 1; //the integer number being tested
32
                      $n2 = 12; //the integer number being tested
33
                      $checkNumber = checkNumber($n1);
34
35
                      //If the exception throws, below text will not be display
                      echo 'If you see this text, the passed value is less than 2';
36
37
                  //catch exception
38
                  catch (Exception $e) {
39
                      echo 'Exception Message: ' .$e->getMessage();
40
41
42
                  finally {
43
                      echo '</br> The finally block always executes.';
44
45
              ?>
46
          </body>
47
      </html>
```



A PHP script to demonstrate the try...catch...finally block
The program tests a number and outputs a correct result or an error message

If you see this text, the passed value is less than 2. The finally block always executes.

```
<?php
                  //user-defined function with an exception
22
                  function checkNumber ($num) {
23
24
                      if(\text{num}=2) {
25
                           //throw an exception
26
                           throw new Exception ("<br>Value must be less than 2");
27
28
                      return true;
29
                  //trigger an exception in a "try" block
30
31
                  try {
32
                      $n1 = 1; //the integer number being tested
33
                      $n2 = 12; //the integer number being tested
                      $checkNumber = checkNumber($n2);
34
35
                      //If the exception throws, below text will not be display
36
                      echo 'If you see this text, the passed value is less than 2';
37
                  //catch exception
38
39
                  catch (Exception $e) {
                      echo 'Exception Message: ' .$e->getMessage();
40
41
42
                  finally {
43
                      echo '</br> The finally block always executes.';
44
45
              ?>
46
          </body>
47
      </html>
```









localhost/PHP_try_1/index.php

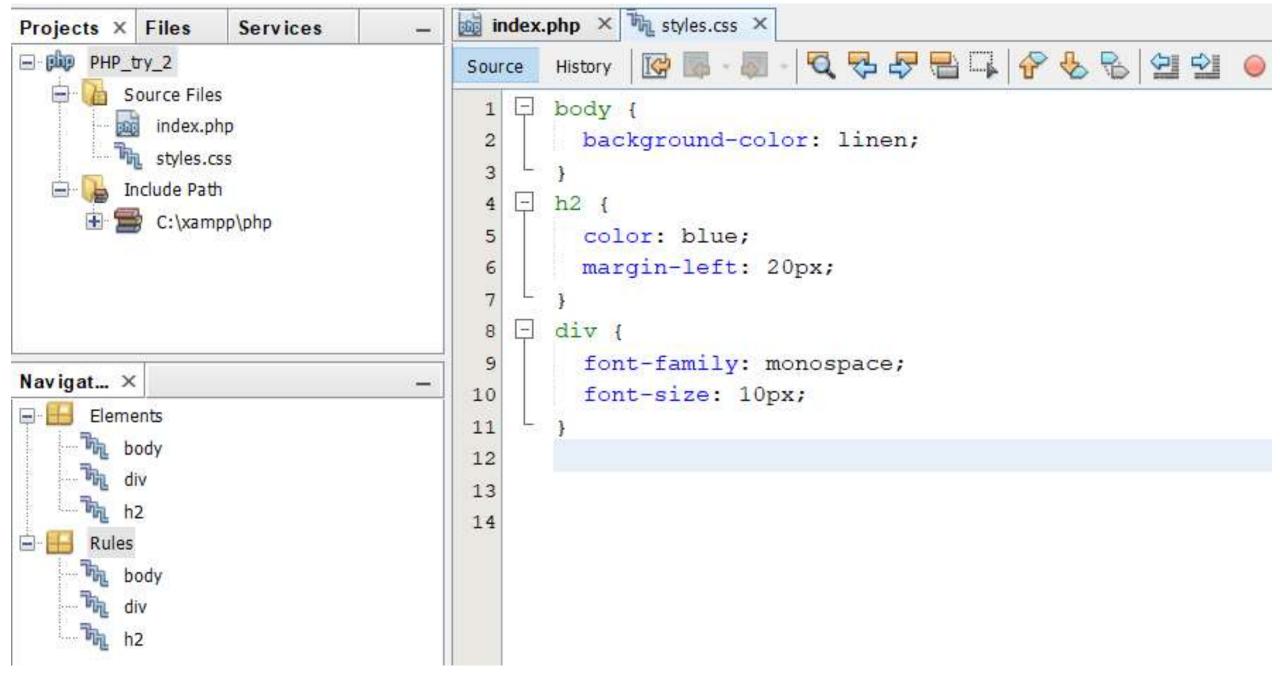
A PHP script to demonstrate the try...catch...finally block
The program tests a number and outputs a correct result or an error message

Exception Message:

Value must be less than 2

The finally block always executes.

Example Two



```
<!DOCTYPE html>
      <!--
 3
      PHP program: PHP try 2
      A second PHP script to test the try...catch...finally block
      A script to test for even and odd numbers using the modulus operator
      Author: Philip Moore
      -->
      <html>
          <head>
              <meta charset="UTF-8">
10
              <title>PHP try 2</title>
11
              <link rel="stylesheet" href="styles.css">
12
13
          </head>
14
          <body>
15
              <div>
                  \langle h2 \rangle
16
17
                       A PHP script to test the try...catch...finally block <br>
18
                       A script to test for even and odd numbers using the modulus operator
                   </h2>
19
              </div>
20
              <?php
```

```
21 😑
              <?php
                  //user-defined function with an exception
22
                  function testEven($num) {
23
                  //trigger throw an exception in a "try" block
24
25
                       try {
                           //the if statement uses the modulus operator
26
27
                           if(\sum_{x \in A} 1)  {
                          //throw an exception if the number is an ODD number
28
                           throw new Exception ("The passed number is an ODD Number");
30
                          //if the number is an EVEN number the following message will be printed
31
                           echo '</br> If you see this text, the passed value is an EVEN Number </b>';
32
33
                      //catch the exception and send an error message to the output
34
                       catch (Exception $e) {
35 =
                           echo '</br> Exception Message: ' .$e->getMessage() .'</b>';
36
37
                      finally {
38
                           echo '</br> The code or message in the finally block always executes.';
39
40
41
                  echo 'The output for an ODD Number';
                  //calls to the testEven() function with parameners
43
                  $n1 = 19;
44
                  $n2 = 12;
45
                  testEven($n1);
46
                  echo '</br></br>';
47
                  echo 'The output for an EVEN Number';
48
                  testEven($n2);
49
50
              ?>
          </body>
51
      </html>
52
53
```





http://localhost/PHP_try_2/index.php





- A PHP script to test the try...catch...finally block
- A script to test for even and odd numbers using the modulus operator

The output for an ODD Number

Exception Message: The passed number is an ODD Number

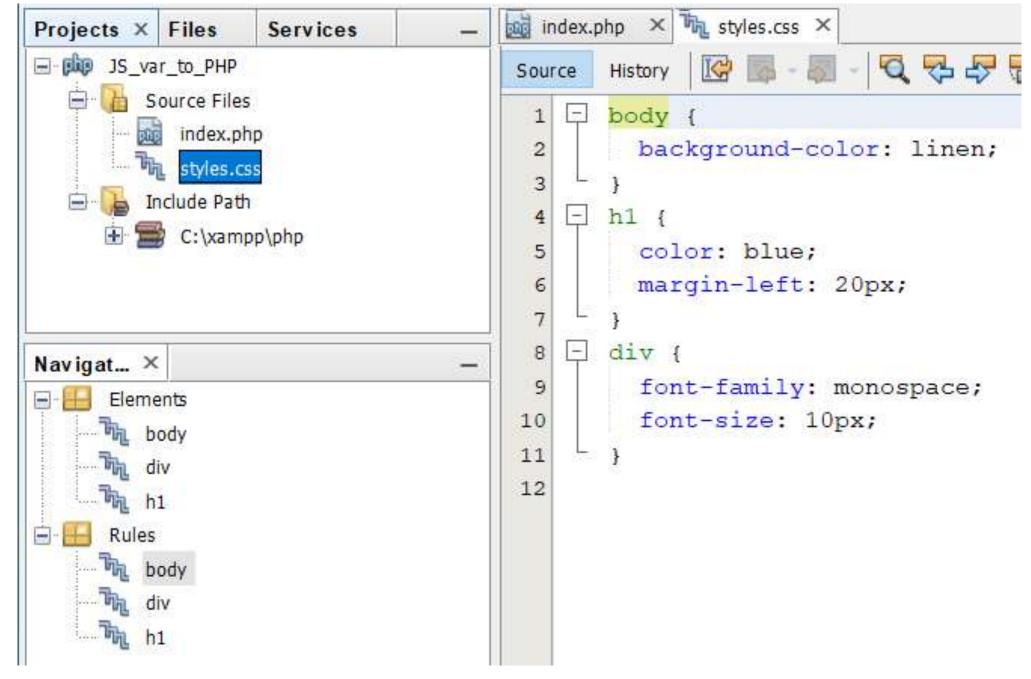
The code or message in the finally block always executes.

The output for an EVEN Number

If you see this text, the passed value is an EVEN Number

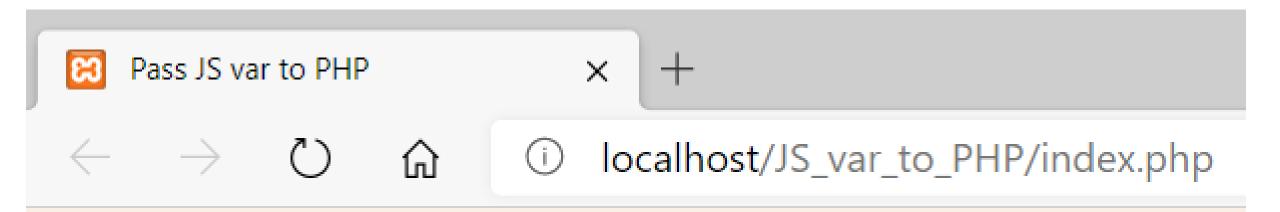
The code or message in the finally block always executes.

A worked Example Pass Data from JavaScript to PHP



```
<!DOCTYPE html>
     <!--
      PHP program: JS var to PHP
      A simple demonstration showing how to pass a JavaScript variable to PHP script
      The JavaScript variable passed to the PHP script is available to the PHP script
      There are alternative methods implemented with form input where required
      -->
      <html>
          <head>
              <meta charset="UTF-8">
10
              <title>Pass JS var to PHP</title>
11
              <script>
12
13
                  function passJS () {
14
                      var js var = 100;
                      //var js var = 10;
15
                      return js var;
16
17
```

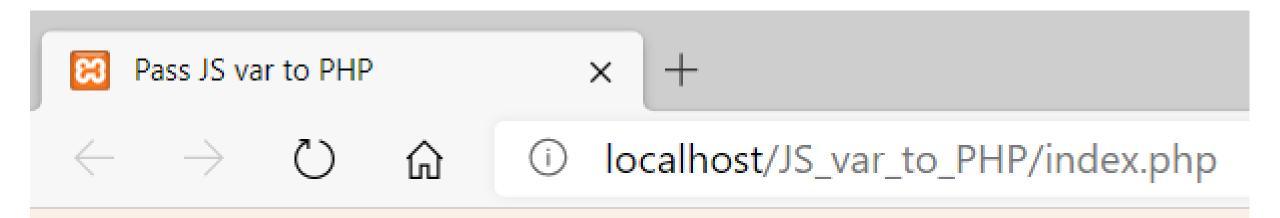
```
<html>
          <head>
 9
              <meta charset="UTF-8">
10
11
              <title>Pass JS var to PHP</title>
12
              <script>
13
                  function passJS () {
                       var js var = 100;
14
                       //var js var = 10;
15
16
                       return js var;
17
              </script>
18
19
              <link rel="stylesheet" href="styles.css">
          </head>
20
          <body>
              <div> <!-- note the use of style with an external CSS file -->
                  <h1>
23
                       Passing JavaScript variables to PHP
24
25
                  </h1>
              </div>
26
              <?php
                   $passVar = "<script>document.write(passJS());</script> <br/>br>";
28
29
                   echo 'The value of the passed JavaScript variable is: '.$passVar;
30
              ?>
31
          </body>
32
      </html>
```



Passing JavaScript variables to PHP

The value of the passed JavaScript variable is: 100

```
<html>
 8
          <head>
 9
               <meta charset="UTF-8">
10
11
               <title>Pass JS var to PHP</title>
12
               <script>
13
                   function passJS () {
                       //var js var = 100;
14
15
                       var js var = 10;
16
                       return js_var;
17
               </script>
18
19
               <link rel="stylesheet" href="styles.css">
          </head>
20
          <body>
21
               <div> <!-- note the use of style with an external CSS file -->
                   \langle h1 \rangle
23
24
                       Passing JavaScript variables to PHP
                   </h1>
25
               </div>
26
               <?php
28
                   $passVar = "<script>document.write(passJS());</script> <br/>br>";
                    echo 'The value of the passed JavaScript variable is: '.$passVar;
29
               ?>
30
          </body>
32
      </html>
```



Passing JavaScript variables to PHP

The value of the passed JavaScript variable is: 10

Review

- In this session introduced:
 - The PHP syntax with the similarities and differences between JavaScript and PHP
 - Selection (conditional statements)
 - Catching runtime errors with worked example programs
 - Passing data between JavaScript and PHP
- There are similarities and differences between JavaScript and PHP
 - The differences are mainly in the language syntax
 - Using the incorrect syntax will produce errors which are hard to find
- In the following tutorials we extend our introduction of PHP