

# LOGICAL OPERATORS

# AFTER THIS PRESENTATION

- You'll appreciate Boolean values
- You'll know more about logical operators and how to use them

# WE WILL LOOK AT

|                |      |
|----------------|------|
| Boolean values | true |
|----------------|------|

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|  |       |
|--|-------|
|  | false |
|--|-------|

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|                   |    |
|-------------------|----|
| Logical operators | && |
|-------------------|----|

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|  |  |
|--|--|
|  |  |
|--|--|

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|  |   |
|--|---|
|  | ! |
|--|---|

# BOOLEAN

- A *Boolean* value is either true or false
- A variable which has a Boolean value is called a Boolean variable

# LOGICAL OPERATORS

- Logical operators work with Boolean values
- JavaScript has these logical operators:
  - Logical And - the && operator
  - Logical Or - the || operator
  - Logical Not - the ! operator

# AND - &&

- && - the result is true if both inputs are true, otherwise the result is false

# AND - &&

| a     | b     | a && b |
|-------|-------|--------|
| false | false | false  |
| false | true  | false  |
| true  | false | false  |
| true  | true  | true   |

```
<html><body><script>
  var you_are_rich = false;
  var you_have_partner = true;
  var you_have_flat = true;
  var life_is_fantastic = you_are_rich
    && you_have_partner && you_have_flat;
  alert("life is fantastic is " +
        life_is_fantastic);
  you_are_rich = true;
  life_is_fantastic = you_are_rich
    && you_have_partner && you_have_flat;
  alert("life is fantastic is now " +
        life_is_fantastic);
</script></body></html>
```



# SHORT-CIRCUIT IN AND

- JavaScript is clever
- When it evaluates an And it checks the first input
- If the value is `false` it knows the result must be `false`
- So it doesn't bother checking the next input

```
<!doctype html>
<html>
  <body><script>
    function first_function() {
      alert("first_function() is running!");
      return true;
    }
    function second_function() {
      alert("second_function() is running!");
      return false;
    }
    var test_function =
      first_function() && second_function();
  </script></body>
</html>
```

# AFTER SWAPPING THE FUNCTIONS

```
<html><body><script>
  function first_function() {
    alert("first_function() is running!");
    return true;
  }
  function second_function() {
    alert("second_function() is running!");
    return false;
  }
  var test_function_swapped =
    second_function() && first_function();
</script></body></html>
```

# OR - ||

- || - the result is false if both inputs are false, otherwise the result is true

# OR - ||

| a     | b     | a    b |
|-------|-------|--------|
| false | false | false  |
| false | true  | true   |
| true  | false | true   |
| true  | true  | true   |

```
<!doctype html>
<html>
  <body><script>
    var you_are_rich = false;
    var you_have_partner = true;
    var you_have_flat = false;
    var life_is_good = you_are_rich
      || you_have_partner || you_have_flat;
    alert("life is good is " + life_is_good);
    you_have_partner = false;
    life_is_good = you_are_rich
      || you_have_partner || you_have_flat;
    alert("life is good is now " + life_is_good);
  </script></body>
</html>
```

# SHORT-CIRCUIT IN OR

- If JavaScript is evaluating Or and the first input is true, it knows the result must be true
- So it doesn't bother checking the second input

```
<!doctype html>
<html>
  <body><script>
    function first_function() {
      alert("first_function() is running!");
      return true;
    }
    function second_function() {
      alert("second_function() is running!");
      return false;
    }
    var test_function =
      first_function() || second_function();
  </script></body>
</html>
```



# NOT - !

- ! - the result is the opposite of the input

# NOT - !

| a     | !a    |
|-------|-------|
| false | true  |
| true  | false |

```
<!doctype html>
<html>
  <head>
    <title>Not Operator Example</title>
  </head>
  <body>
    <script>
      var you_are_male = true;
      var you_are_female = !you_are_male;
      alert("you_are_male is " + you_are_male);
      alert("you_are_female is " + you_are_female);
    </script>
  </body>
</html>
```