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AN EXAMPLE JAVASCRIPT PROJECT

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AFTER THIS PRESENTATION

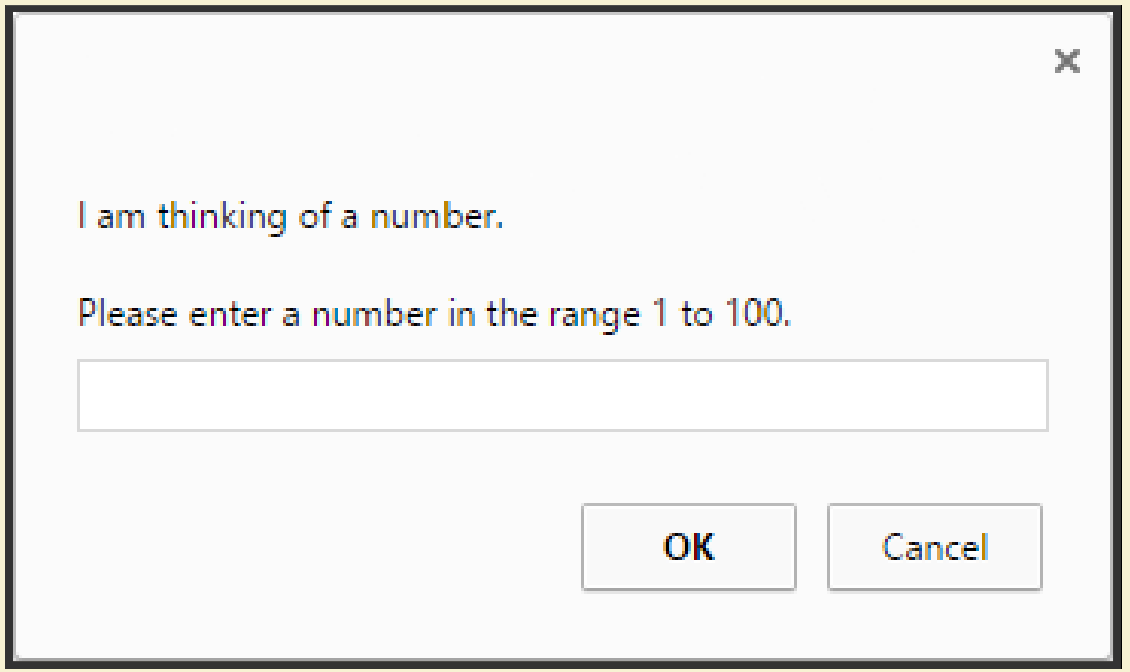
- You'll have stronger JavaScript skills!

THIS PROJECT USES

`function`	`while`	`alert()`	`Math.random()`
`return`	`if`	`prompt()`	`Math.floor()`
`onload()`			`parseInt()`
			`isNaN()`

STRENGTHENING YOUR UNDERSTANDING

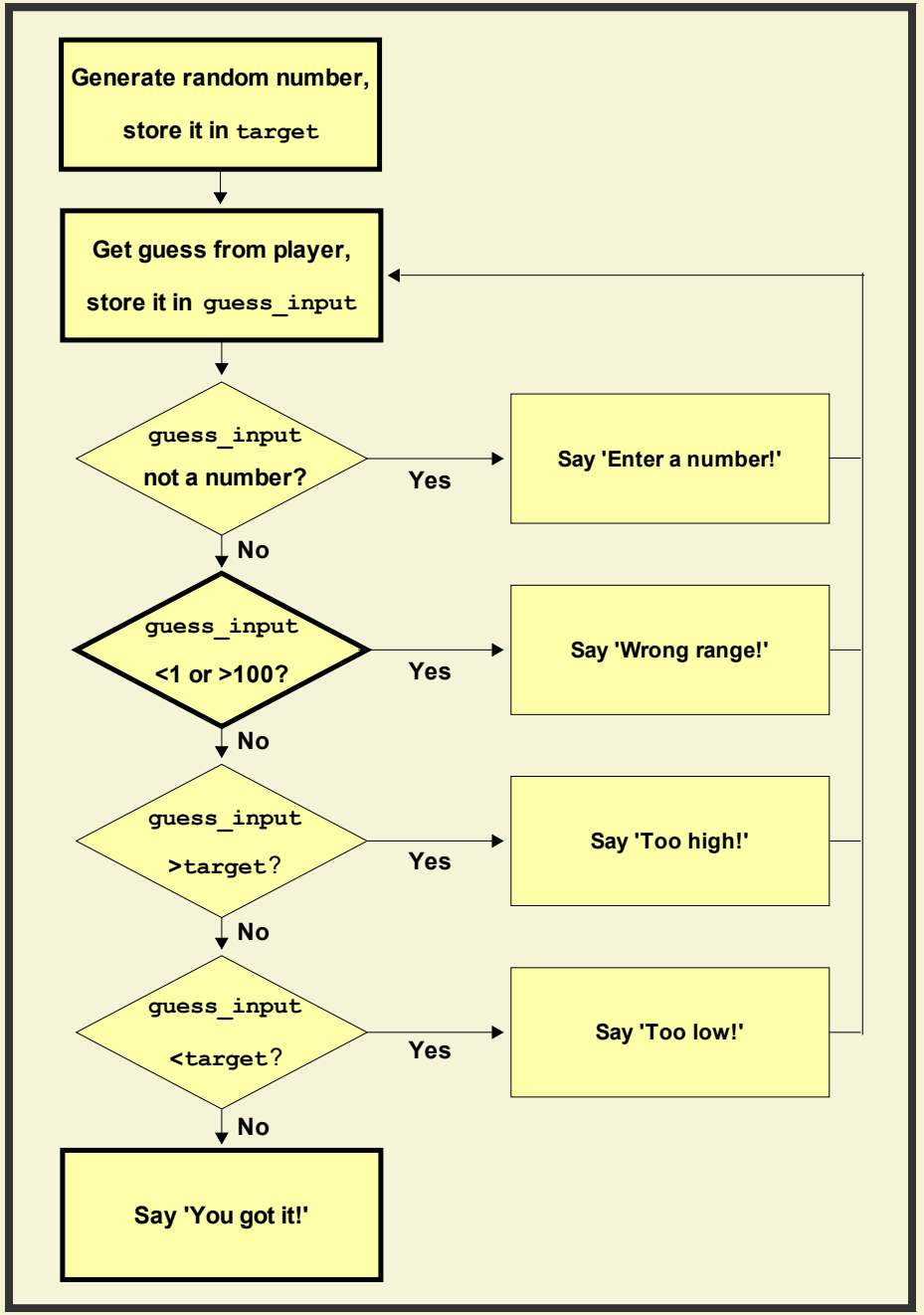
- Let's use some of the techniques you have learned
- We will make a simple guessing game



Click here to play the game

HOW IT WORKS

- The computer thinks of a number in the range [1, 100]
- The player has to guess what it is
- The computer tells the player if
  if answer is right or wrong
- When the game is over, the player is told how many times they guessed


Generate random number, store it in target
Get guess from player, store it in guess_input
guess_input not a number?
Yes
Say 'Enter a number!'
No
guess_input <1 or >100?
Yes
Say 'Wrong range!'
No
guess_input >target?
Yes
Say 'Too high!'
No
guess_input <target?
Yes
Say 'Too low!'
No
Say 'You got it!'

HTML PART

```
<html>
<head>
    <title>JavaScript Guessing Game</title>
</head>
    <body onload="do_game()">
        <script src="js_guessing_game.js">
        </script>
    </body>
</html>
```

- The main function is triggered when the web page is loaded:

```
<body onload="do_game()">
```

- The actual code is stored in another file:

```
<script src="js_guessing_game.js">
</script>
```

JAVASCRIPT COMPONENTS

- 1. The global variables
- 2. The main game function - `do_game( )`
  - 2.1. Generate a random number in the range [1,100]
  - 2.2. A `while` loop
- 3. Check the input function - check_guess()
  - To check whether the player's guess is:
    3.1. not a number, 3.2. out of range, 3.3. too large,
    3.4. too small, or 3.5. correct
  - 3.5. Give feedback to the user

1. THE GLOBAL VARIABLES

```
var target;
var guess_input_text;
var guess_input;
var finished = false;
var guesses = 0;
```

2. MAIN GAME FUNCTION

- 2.1. Generate a random number in the range 1 to 100

```
var random_number = Math.random() * 100;
var random_number_integer = Math.floor(random_number);
target = random_number_integer + 1;
```

- 2.2. Use a `while` loop

```
while (!finished) {
```

. . . code goes here . . .

```
};
```

2.2. INSIDE THE WHILE LOOP

1. Get the player's input

```
guess_input_text = prompt("Please enter a number " +
                          "in the range 1 to 100.");
```

2. Convert the input to an integer

```
guess_input = parseInt(guess_input_text);
```

3. Increment the number of guesses

```
guesses += 1
```

4. Check the player's answer

```
finished = check_guess();
```

3. CHECK_GUESS()

- Checks whether the player's guess is:
  - 3.1. Not a number
  - 3.2. Out of range
  - 3.3. Too large
  - 3.4. Too small
  - 3.5. Correct

ISNAN() FUNCTION

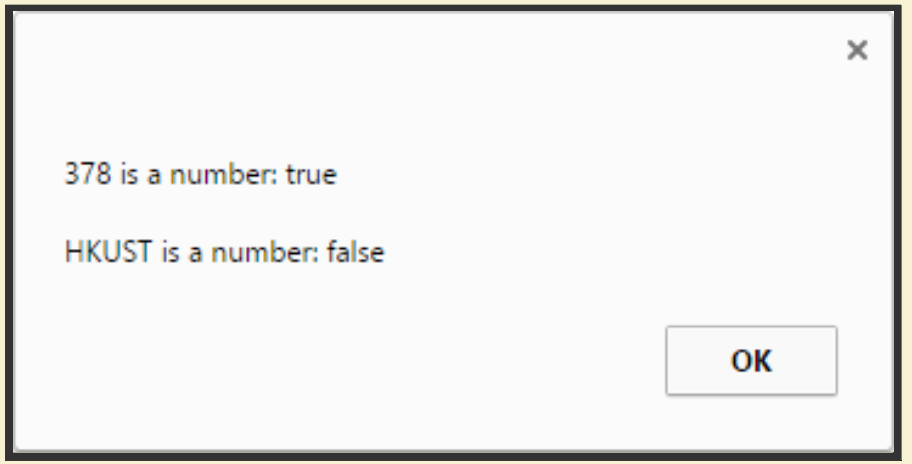
- Returns true if the input parameter
  is NOT a number and vice versa
- We will make use of this function
  to check whether the player has entered a number

ISNAN() EXAMPLE

```
<html>
<head>
    <title>isNaN() Example</title>
</head>
<body><script>
    alert("378 is a number: " + !isNaN(378) +"\n\n" +
          "HKUST is a number: " + !isNaN("HKUST"));
</script></body>
</html>
```

Click here to see the example

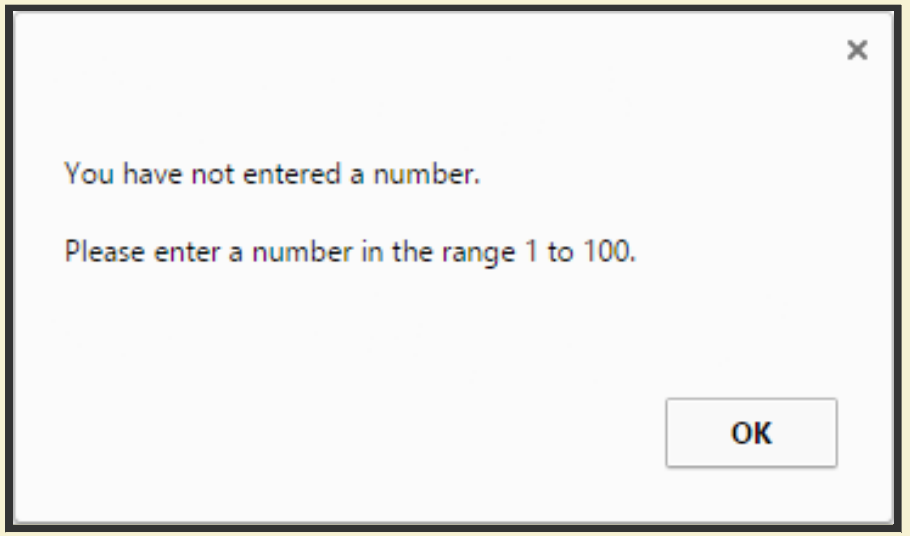
ISNAN() EXAMPLE



IF THE PLAYER'S GUESS IS :

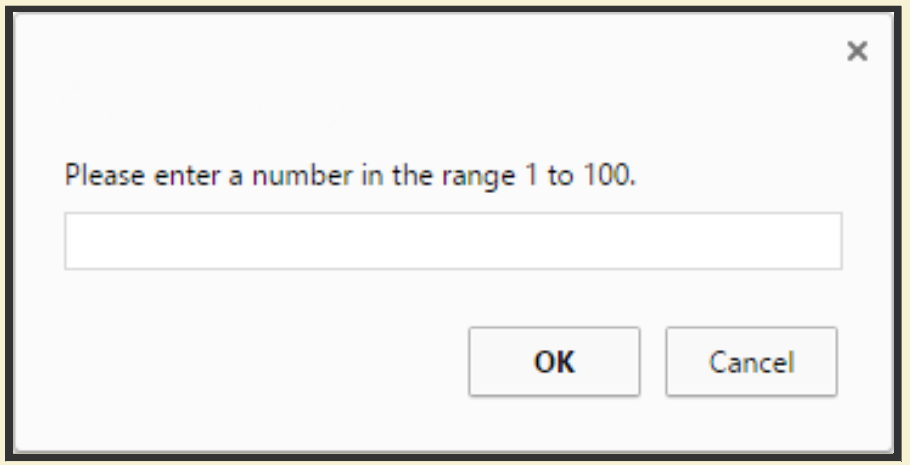
3.1. NOT A NUMBER

```
if (isNaN(guess_input)) {
    alert("You have not entered a number.\n\n" +
          "Please enter a number in the range 1 to 100.");
    return false;
}
```



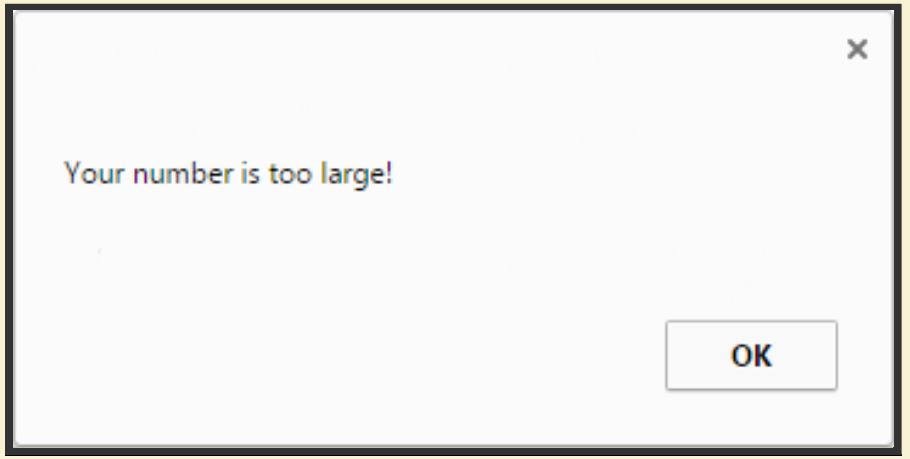
3.2. OUT OF RANGE

```
if ((guess_input < 1) || (guess_input > 100)) {
    alert("Please enter an integer number" +
          "in the range 1 to 100.");
    return false;
}
```



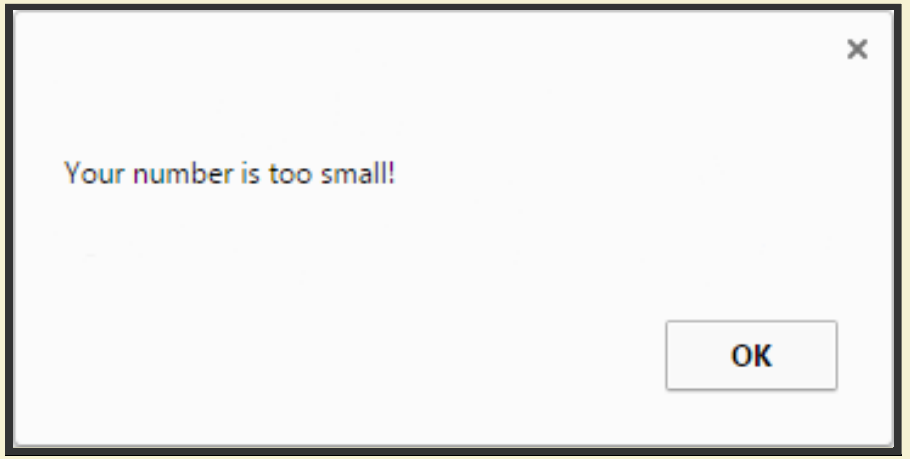
3.3. TOO LARGE

```
if (guess_input > target) {
    alert("Your number is too large!");
    return false;
}
```



3.4. TOO SMALL

```
if (guess_input < target) {
    alert("Your number is too small!");
    return false;
}
```



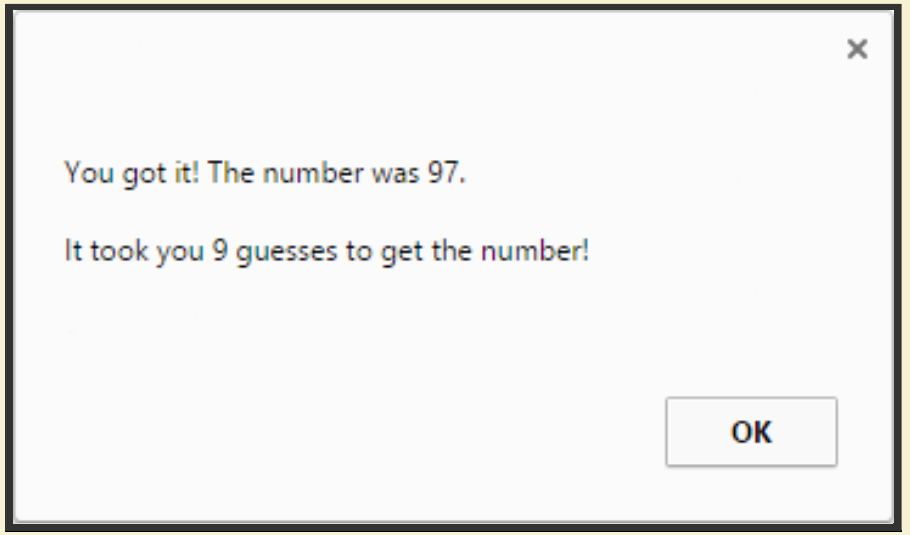
3.5. CORRECT

1. Congratulate the player and show the number of guesses

```
alert("You got it! The number was " + target +
      ". \n It took you " + guesses +
      "guesses to get the number!");
```

2. Return a `true` value to the main function

```
return true;
```


You got it! The number was 97.
It took you 9 guesses to get the number!
OK

```
var target;
var guess_input_text;
var guess_input;
var finished = false;
var guesses = 0;

function do_game(){
    var random_number = Math.random() * 100;
    var random_number_integer = Math.floor(random_number);
    target = random_number_integer + 1;

    while (!finished) {
        guess_input_text = prompt("I am thinking of a number "+
                                  "in the range 1 to 100.\n\n"+
                                  "What is the number? ");
        guess_input = parseInt(guess_input_text);
        guesses += 1;
        finished = check_guess();
    }
}
```

```
function check_guess() {
    if (isNaN(guess_input)) {
        alert("You have not entered a number.\n\n" +
              "Please enter a number in the range 1 to 100.");
        return false;
    }
    if ((guess_input < 1) || (guess_input > 100)) {
        alert("Please enter an integer number in the range 1 to 100.");
        return false;
    }
    if (guess_input > target) {
        alert("Your number is too large!");
        return false;
    }
    if (guess_input < target) {
        alert("Your number is too small!");
        return false;
    }
    alert("You got it! The number was " + target +
          ".\n\nIt took you " + guesses +
          " guesses to get the number!");
    return true;
}
```