JavaScript Form

Summary: in this tutorial, you will learn about JavaScript form API: accessing the form, getting values of the elements, validating form data, and submitting the form.

Form basics

To create a form in HTML, you use the `<form>` element:

```
<form action="/signup" method="post" id="signup">
</form>
```

The `<form>` element has two important attributes: `action` and `method`.

- The `action` attribute specifies a URL that will process the form submission. In this example, the action is the `/signup` URL.
- The `method` attribute specifies the HTTP method to submit the form with. Usually, the method is either `post` or `get`.

Generally, you use the `get` method when you want to retrieve data from the server and the `post` method when you want to change data on the server.

JavaScript uses the `HTMLFormElement` object to represent a form. The `HTMLFormElement` has the following properties that correspond to the HTML attributes:

- `action` – is the URL that processes the form data. It is equivalent to the `action` attribute of the `<form>` element.
- `method` – is the HTTP method which is equivalent to the `method` attribute of the `<form>` element.

The `HTMLFormElement` element also provides the following useful methods:

- `submit()` – submit the form.
- `reset()` – reset the form.

Referencing forms

To reference the `<form>` element, you can use DOM selecting methods such as `getElementById()`:

```
const form = document.getElementById('subscribe');
```

An HTML document can have multiple forms. The `document.forms` property returns a collection of forms (`HTMLFormControlsCollection`) on the document:

```
document.forms
```

To reference a form, you use an index. For example, the following statement returns the first form of the HTML document:

```
document.forms[0]
```

Submitting a form

Typically, a form has a submit button. When you click it, the browser sends the form data to the server. To create a submit button, you use `<input>` or `<button>` element with the type `submit`:

```
<input type="submit" value="Subscribe">
```

Or

```
<button type="submit">Subscribe</button>
```

If the submit button has focus and you press the `Enter` key, the browser also submits the form data.

When you submit the form, the `submit` event is fired before the request is sent to the server. This gives you a chance to validate the form data. If the form data is invalid, you can stop submitting the form.

To attach an event listener to the `submit` event, you use the `addEventListener()` method of the form element as follows:

```
const form  = document.getElementById('signup');

form.addEventListener('submit', (event) => {
    // handle the form data
});
```

To stop the form from being submitted, you call the `preventDefault()` method of the `event` object inside the `submit` event handler like this:

```
form.addEventListener('submit', (event) => {
    // stop form submission
    event.preventDefault();
});
```

Typically, you call the `event.preventDefault()` method if the form data is invalid. To submit the form in JavaScript, you call the `submit()` method of the form object:

```
form.submit();
```

Note that the `form.submit()` does not fire the `submit` event. Therefore, you should always validate the form before calling this method.

Accessing form fields

To access form fields, you can use DOM methods like `getElementsByName()`, `getElementById()`, `querySelector()`, etc.

Also, you can use the `elements` property of the `form` object. The `form.elements` property stores a collection of the form elements.

JavaScript allows you to access an element by index, id, or name. Suppose that you have the following signup form with two `<input>` elements:

```
<form action="signup.html" method="post" id="signup">
        <h1>Sign Up</h1>
        <div class="field">
                <label for="name">Name:</label>
                <input type="text" id="name" name="name" placeholder="Enter your fullname" /
                <small></small>
        </div>
        <div class="field">
                <label for="email">Email:</label>
                <input type="text" id="email" name="email" placeholder="Enter your email addr
                <small></small>
        </div>
        <button type="submit">Subscribe</button>
</form>
```

To access the elements of the form, you get the form element first:

```
const form = document.getElementById('signup');
```

And use index, id, or name to access the element. The following accesses the first form element:

```
form.elements[0]; // by index
form.elements['name']; // by name
form.elements['name']; // by id (name & id are the same in this case)
```

The following accesses the second input element:

```
form.elements[1]; // by index
form.elements['email']; //  by name
```

```
form.elements['email']; // by id
```

After accessing a form field, you can use the `value` property to access its value, for example:

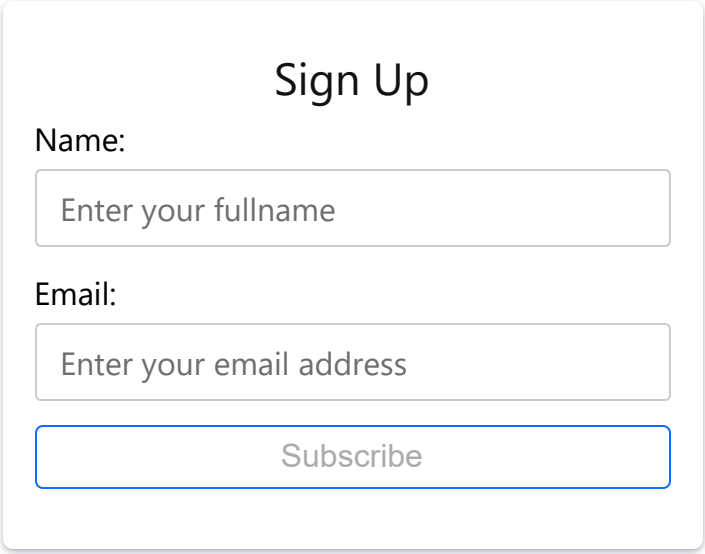
```
const form = document.getElementById('signup');
const name = form.elements['name'];
const email = form.elements['email'];

// getting the element's value
let fullName = name.value;
let emailAddress = email.value;
```

Put it all together: signup form

The following illustrates the HTML document that has a signup form. See the live demo here.

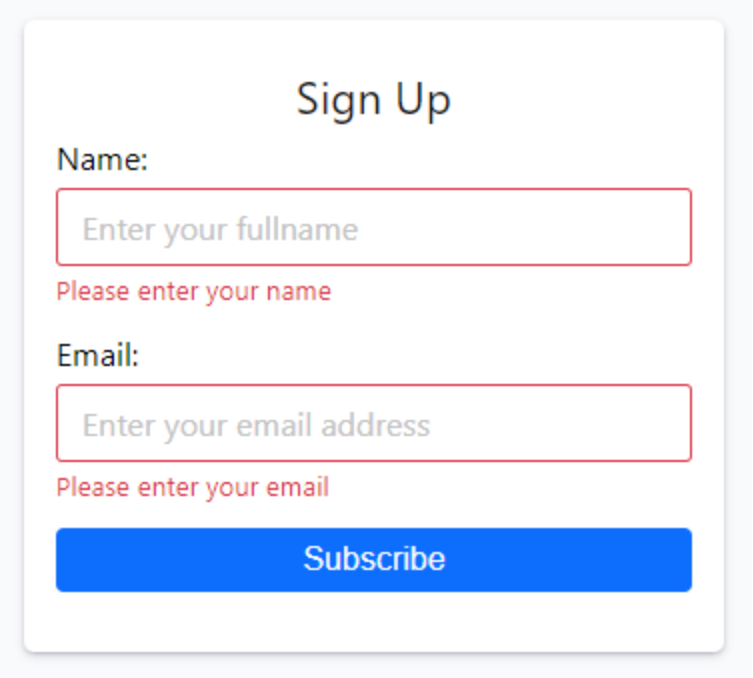
Output



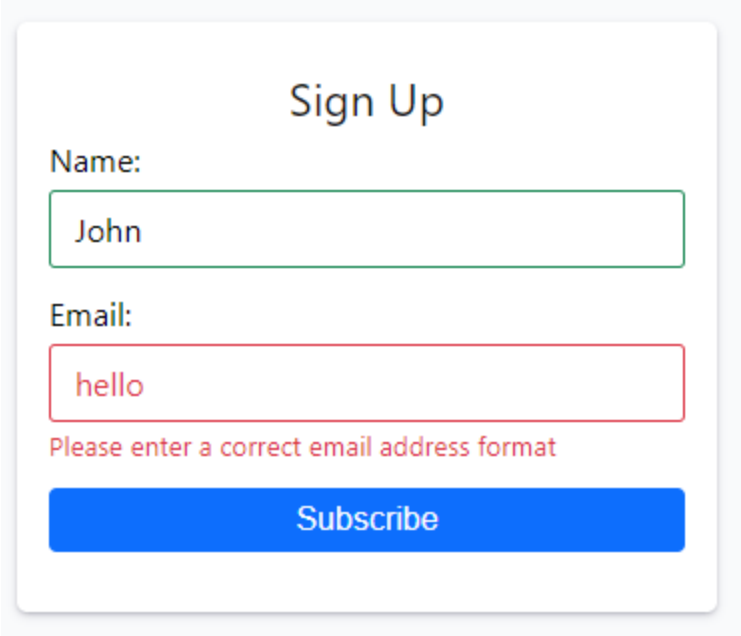
```
<!DOCTYPE html>
<html lang="en">
        <head>
                <title>JavaScript Form Demo</title>
                <meta name="viewport" content="width=device-width, initial-scale=1.0" />
                <link rel="stylesheet" href="css/style.css" />
        </head>
        <body>
                <div class="container">
                        <form action="signup.html" method="post" id="signup">
                                <h1>Sign Up</h1>
                                <div class="field">
                                        <label for="name">Name:</label>
                                        <input type="text" id="name" name="name" placeholder=
                                        <small></small>
                                </div>
                                <div class="field">
                                        <label for="email">Email:</label>
                                        <input type="text" id="email" name="email" placeholde
                                        <small></small>
                                </div>
                                <div class="field">
                                        <button type="submit" class="full">Subscribe</button>
                                </div>
                        </form>
                </div>
                <script src="js/app.js"></script>
        </body>
</html>
```

The HTML document references the `style.css` and `app.js` files. It uses the `<small>` element to display an error message in case the `<input>` element has invalid data.

Submitting the form without providing any information will result in the following error:



Submitting the form with the name but an invalid email address format will result in the following error:



The following shows the complete `app.js` file:

```
// show a message with a type of the input
function showMessage(input, message, type) {
        // get the small element and set the message
        const msg = input.parentNode.querySelector("small");
        msg.innerText = message;
```

```
        // update the class for the input
        input.className = type ? "success" : "error";
        return type;
}

function showError(input, message) {
        return showMessage(input, message, false);
}

function showSuccess(input) {
        return showMessage(input, "", true);
}

function hasValue(input, message) {
        if (input.value.trim() === "") {
                return showError(input, message);
        }
        return showSuccess(input);
}

function validateEmail(input, requiredMsg, invalidMsg) {
        // check if the value is not empty
        if (!hasValue(input, requiredMsg)) {
                return false;
        }
        // validate email format
        const emailRegex =
                /^(([^<>()\[\]\\.,;:\s@"]+(\.[^<>()\[\]\\.,;:\s@"]+)*)|(".+"))@((\[[0-9]{1,3}

        const email = input.value.trim();
        if (!emailRegex.test(email)) {
                return showError(input, invalidMsg);
        }
        return true;
}

const form = document.querySelector("#signup");

const NAME_REQUIRED = "Please enter your name";
const EMAIL_REQUIRED = "Please enter your email";
```

```
const EMAIL_INVALID = "Please enter a correct email address format";

form.addEventListener("submit", function (event) {
        // stop form submission
        event.preventDefault();

        // validate the form
        let nameValid = hasValue(form.elements["name"], NAME_REQUIRED);
        let emailValid = validateEmail(form.elements["email"], EMAIL_REQUIRED, EMAIL_INVALID)
        // if valid, submit the form.
        if (nameValid && emailValid) {
                alert("Demo only. No form was posted.");
        }
});
```

How it works.

The showMessage() function

The `showMessage()` function accepts an input element, a message, and a type:

```
// show a message with a type of the input
function showMessage(input, message, type) {
        // get the <small> element and set the message
        const msg = input.parentNode.querySelector("small");
        msg.innerText = message;
        // update the class for the input
        input.className = type ? "success" : "error";
        return type;
}
```

The following shows the name input field on the form:

```
<div class="field">
        <label for="name">Name:</label>
        <input type="text" id="name" name="name" placeholder="Enter your fullname" />
```

```
        <small></small>
</div>
```

If the name's value is blank, you need to get its parent first which is the `<div>` with the class "field".

```
input.parentNode
```

Next, you need to select the `<small>` element:

```
const msg = input.parentNode.querySelector("small");
```

Then, update the message:

```
msg.innerText = message;
```

After that, we change the CSS class of the input field based on the value of the type parameter. If the type is true, we change the class of the input to success. Otherwise, we change the class to error.

```
input.className = type ? "success" : "error";
```

Finally, return the value of the type:

```
return type;
```

The showError() and showSuccess() functions

The the `showError()` and `showSuccess()` functions call the `showMessage()` function. The `showError()` function always returns `false` whereas the `showSuccess()` function always returns `true` . Also, the `showSuccess()` function sets the error message to an empty string.

```
function showError(input, message) {
        return showMessage(input, message, false);
}
```

```
function showSuccess(input) {
        return showMessage(input, "", true);
}
```

The hasValue() function

The `hasValue()` function checks if an input element has a value or not and shows an error message using the `showError()` or `showSuccess()` function accordingly:

```
function hasValue(input, message) {
        if (input.value.trim() === "") {
                return showError(input, message);
        }
        return showSuccess(input);
}
```

The validateEmail() function

The `validateEmail()` function validates if an email field contains a valid email address:

```
function validateEmail(input, requiredMsg, invalidMsg) {
        // check if the value is not empty
        if (!hasValue(input, requiredMsg)) {
                return false;
        }
        // validate email format
        const emailRegex =
                /^(([^<>()\[\]\\.,;:\s@"]+(\.[^<>()\[\]\\.,;:\s@"]+)*)|(".+"))@((\[[0-9]{1,3}

        const email = input.value.trim();
        if (!emailRegex.test(email)) {
                return showError(input, invalidMsg);
        }
        return true;
}
```

The `validateEmail()` function calls the `hasValue()` function to check if the field value is empty. If the input field is empty, it shows the `requiredMsg` .

To validate the email, it uses a regular expression. If the email is invalid, the `validateEmail()` function shows the `invalidMsg` .

The submit event handler

First, select the signup form by its id using the `querySelector()` method:

```
const form = document.querySelector("#signup");
```

Second, define some constants to store the error messages:

```
const NAME_REQUIRED = "Please enter your name";
const EMAIL_REQUIRED = "Please enter your email";
const EMAIL_INVALID = "Please enter a correct email address format";
```

Third, add the `submit` event listener of the signup form using the `addEventListener()` method:

```
form.addEventListener("submit", function (event) {
        // stop form submission
        event.preventDefault();

        // validate the form
        let nameValid = hasValue(form.elements["name"], NAME_REQUIRED);
        let emailValid = validateEmail(form.elements["email"], EMAIL_REQUIRED, EMAIL_INVALID)
        // if valid, submit the form.
        if (nameValid && emailValid) {
                alert("Demo only. No form was posted.");
        }
});
```

In the submit event handler:

1. Stop the form submission by calling the `event.preventDefault()` method.
2. Validate the name and email fields using the `hasValue()` and `validateEmail()` functions.

3. If both name and email are valid, show an alert. In a real-world application, you need to call the `form.submit()` method to submit the form.

Summary

- Use the `<form>` element to create an HTML form.
- Use DOM methods such as `getElementById()` and `querySelector()` to select a `<form>` element. The `document.forms[index]` also returns the form element by a numerical index.
- Use `form.elements` to access form elements.
- The `submit` event fires when users click the submit button on the form.