

ToiletPaper #117

What is JSX/TSX?

Author: Santo Pfungsten / Software Engineer / jambit Office Leipzig

✘ Problem

Anyone who has ever worked with React will know the file extension JSX (TSX for TypeScript) and the HTML-related syntax. But what lies under the hood?

```
const profile = <div>
  <img src={u.avatar} className="profile" alt={`Pic of ${u.firstName}`} />
  <h3>[[u.firstName, u.lastName].join(' ')]</h3>
</div>;
```

✓ Solution

A transpiler (e.g. `babel` or `tsc`) converts JSX/TSX into pure JavaScript code. The example shown above would be compiled to the following JS:

```
const profile = React.createElement("div", null,
  React.createElement("img", { src: u.avatar, className: "profile", alt: `Pic
of ${u.firstName}` }),
  React.createElement("h3", null, [u.firstName, u.lastName].join(" "))
);
```

- The function `React.createElement` gets as first parameter either a tag name or a component (function or class component).
 - If the tag name in the JSX is lowercase, e.g. `<button>`, the parameter is a string, otherwise (e.g. `<Button>`) it is a function or a class (which must be present in the scope with the same name).
- The second parameter is an object with all properties assigned to the tag. If no properties have been assigned, this parameter is null.
- The remaining parameters are the children that have been inserted into the tag.

➔ Example

You can easily write a replacement for `React` which, instead of a Virtual DOM, creates real HTML elements with `document.createElement`:

```
function h(tag, props, ...children) {
  if (typeof tag === "function") return tag({ ...props, children });
  const element = document.createElement(tag);
  if (props) setAllAttributes(element, props);
  applyChildren(element, children);
  return element;
}
```

This function can be called instead of calling `React.createElement`. This very simple example even supports function components.

+ Further Aspects

- Babel: <https://babeljs.io/docs/en/6.26.3/babel-plugin-transform-react-jsx>
- TypeScript: <https://www.typescriptlang.org/docs/handbook/jsx.html>
- The last example in TypeScript a bit more in detail: <https://github.com/Lusito/tsx-dom>
- React without JSX: <https://reactjs.org/docs/react-without-jsx.html>
- Why JSX in React: <https://reactjs.org/docs/introducing-jsx.html>