Automating Code Changes for 100 Repositories

Getting Started With Codemods 👨‍💻

@mrkosima

About me

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Program Committee Member at GitNation

@mrkosima

klimashevich

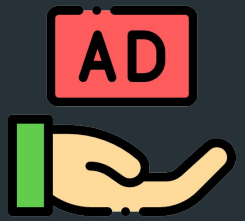
Marktplaats.nl - largest marketplace in NL

6.5M

visitors
per day

19M

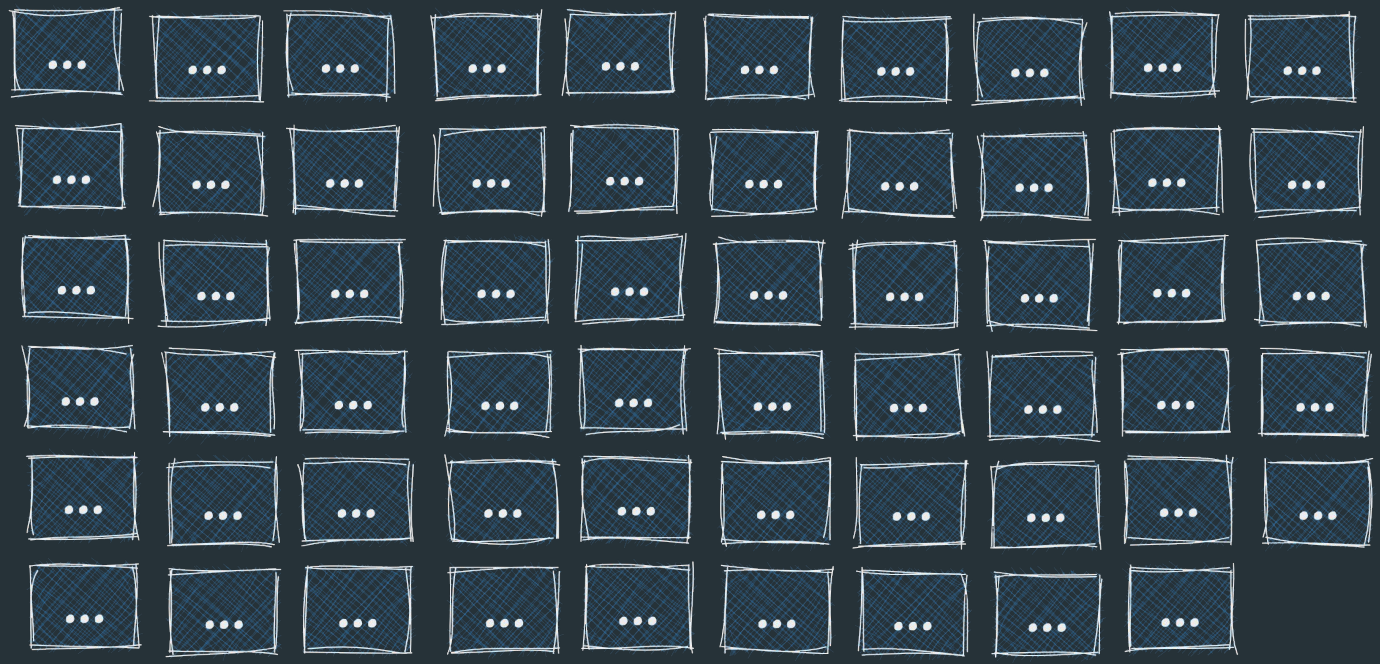
live ads
at any time



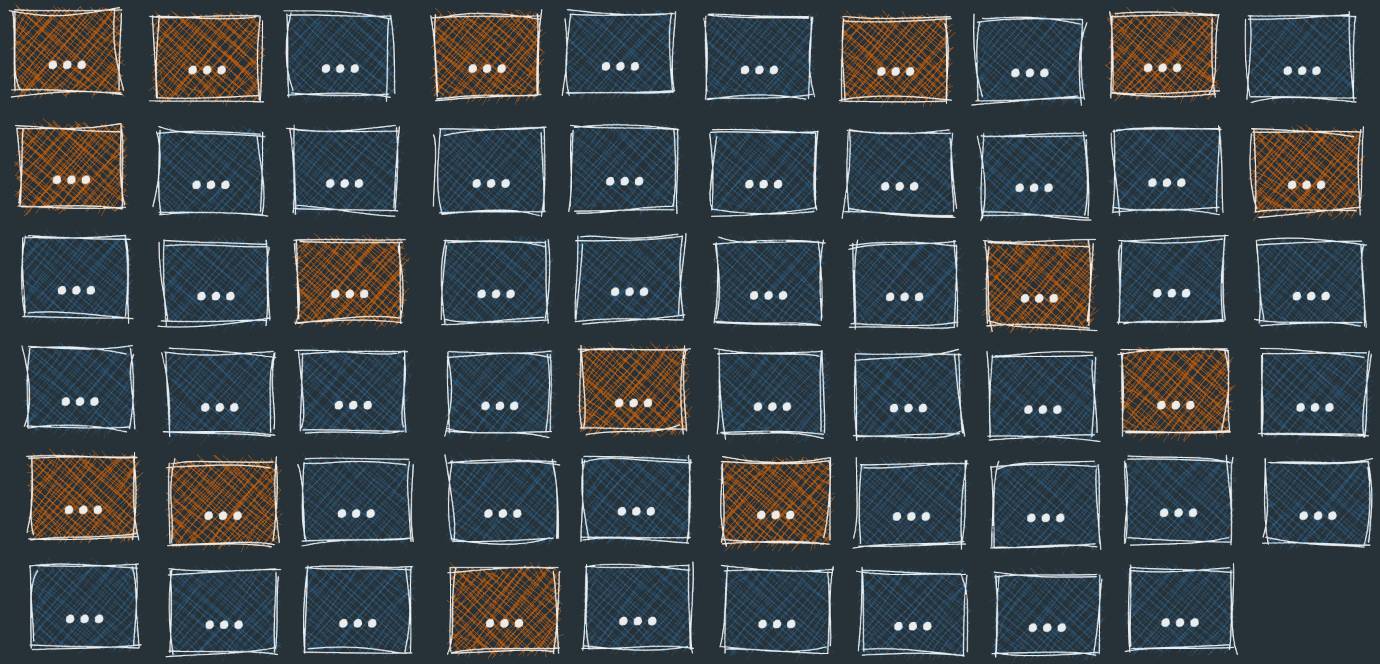
350K

new adv
per day

BFF services



BFF services - daily releases



59 Services in Production > 15 prod releases / day

JS/TS repositories

JS/TS repositories - code ownership

Domain FE Teams

FE Platform Team

FE Platform repositories

Change code

Frontend repositories

@mp/design-system@1.0.0

```
export const PrimaryButton = ({ onClose }) => {
    /*...*/
}
```

Toast.tsx

```
import { Card, PrimaryButton, Text } from '@mp/design-system';

export const Toast = ({ message, onClose }) => {
  return (
    <Card>
        <Text>{message}</Text>
        <PrimaryButton onClick={onClose}>
            Close
        </PrimaryButton>
    </Card>
  )
}
```

Toast.tsx

*@mp/design-system@**1.0.0***

```
import { Card, PrimaryButton, Text } from '@mp/design-system';

export const Toast = ({ message, onClose }) => {
  return (
    <Card>
        <Text>{message}</Text>
        <PrimaryButton onClick={onClose}>
            Close
        </PrimaryButton>
    </Card>
  )
}
```

@mp/design-system@2.0.0

```
export const Button = ({ kind, onClose }) => {
    /*...*/
}
```

Toast.tsx

*@mp/design-system@**2.0.0***

```
import { Card, Button, Text } from '@mp/design-system';

export const Toast = ({ message, onClose }) => {
  return (
    <Card>
        <Text>{message}</Text>
        <Button kind="primary" onClick={onClose}>
            Close
        </Button>
    </Card>
  )
}
```

Toast.tsx

```
- import { Card, PrimaryButton, Text } from '@mp/design-system';
+ import { Card, Button, Text } from '@mp/design-system';

export const Toast = ({ message, onClick }) => {
  return (
    <Card>
        <Text>{message}</Text>
-       <PrimaryButton onClick={onClose}>
+       <Button kind="primary" onClick={onClose}>
            Close
 -      </PrimaryButton>
 +      </Button>
    </Card>
  )
}
```

*.tsx

```
- import { Card, PrimaryButton, Text } from '@mp/design-system';
+ import { Card, Button, Text } from '@mp/design-system';

export const Toast = ({
  return (
    <Card>
      <Text>
-       <Prima
+       <Butto
            Cl
      -     </Prima
      +     </Butto
    </Card>
  )
}
```

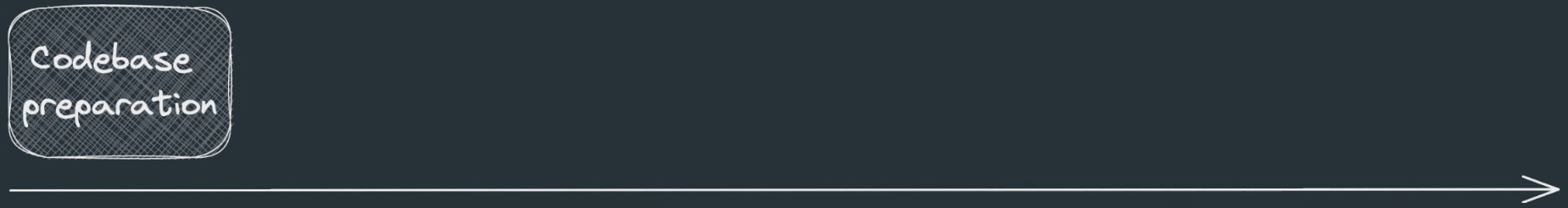
*.jsx

```
- import { Card, PrimaryButton, Text } from '@mp/design-system';
+ import { Car                  Text } from '@mp/design-system';

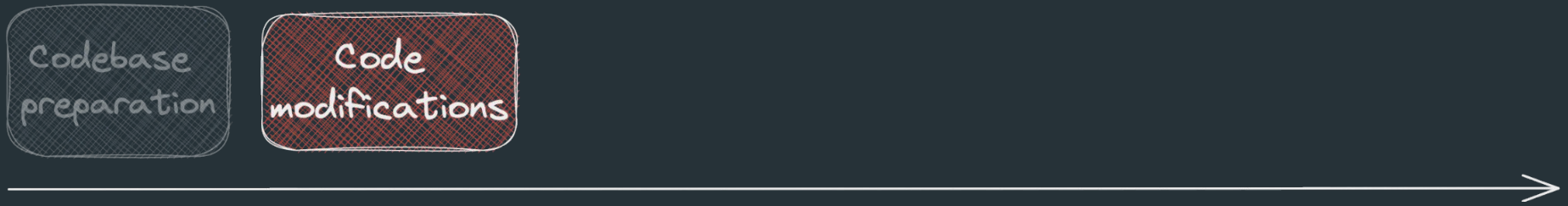
export const
  return (
    <Card>
      <Tex
-     <Pri
+     <But

 -    </Prima
 +    </Butto
    </Card>
  )
}
```

Automation

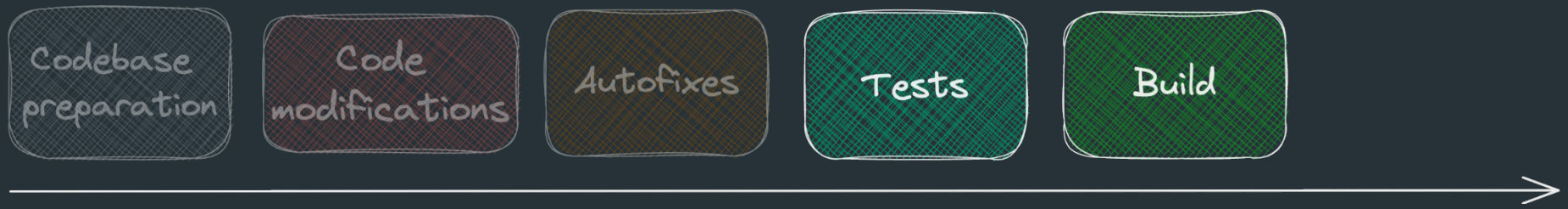


Automation



Automation

Automation


Codebase preparation
Code modifications
Autofixes
Tests
Build

Automation


Codebase preparation
Code modifications
Autofixes
Tests
Build
Commit changes

Automation


Codebase preparation
Code modifications
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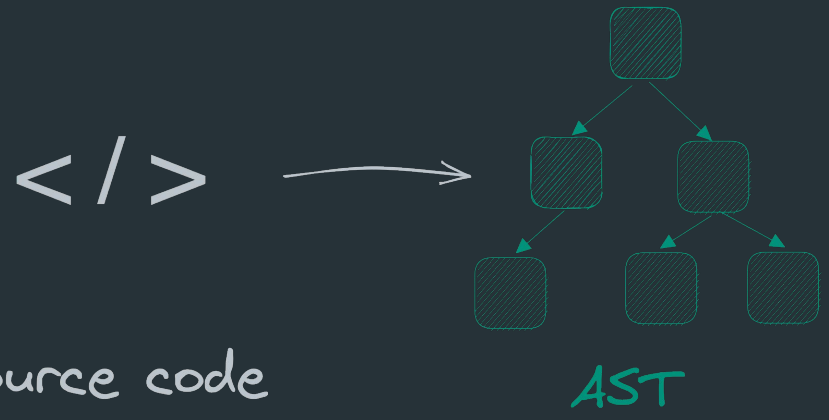
Build
Commit changes

Abstract Syntax Tree (AST)



```
function greet() {
    return "Hi Berlin 👋!"
}
```

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function greet() {
    return "Hi Berlin 👋!"
}
```

```
Program {
  - body: [
    - FunctionDeclaration {
      - id: Identifier {
          name: "greet"
        }
        params: [ ]
        body: BlockStatement {
          - body: [
            - ReturnStatement {
                - argument: Literal {
                    value: "Hi Berlin 👋!"
                  }
              }
            ]
        }
        expression: false
        generator: false
        async: false
      }
  ]
  sourceType: "module"
}
```

```
function greet() {
    return "Hi Berlin 👋!"
}
```

```
Program {
  - body: [
    - FunctionDeclaration {
      - id: Identifier {
          name: "greet"
        }
        params: [ ]
        body: BlockStatement {
          - body: [
            - ReturnStatement {
                - argument: Literal {
                    value: "Hi Berlin 👋!"
                  }
              }
            ]
        }
        expression: false
        generator: false
        async: false
      }
  ]
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```

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Program {
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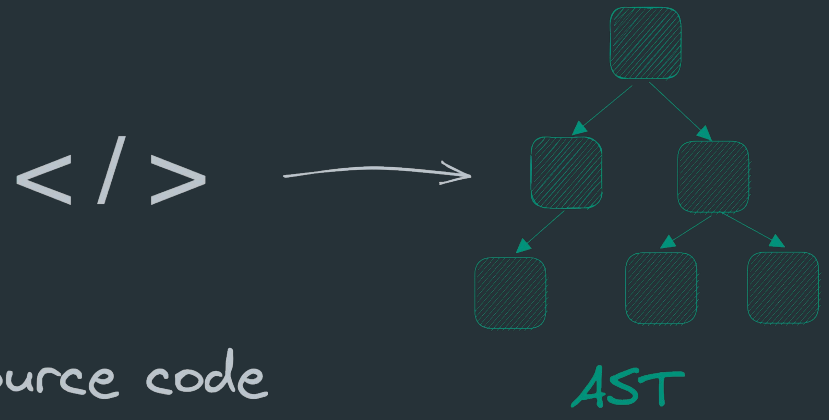
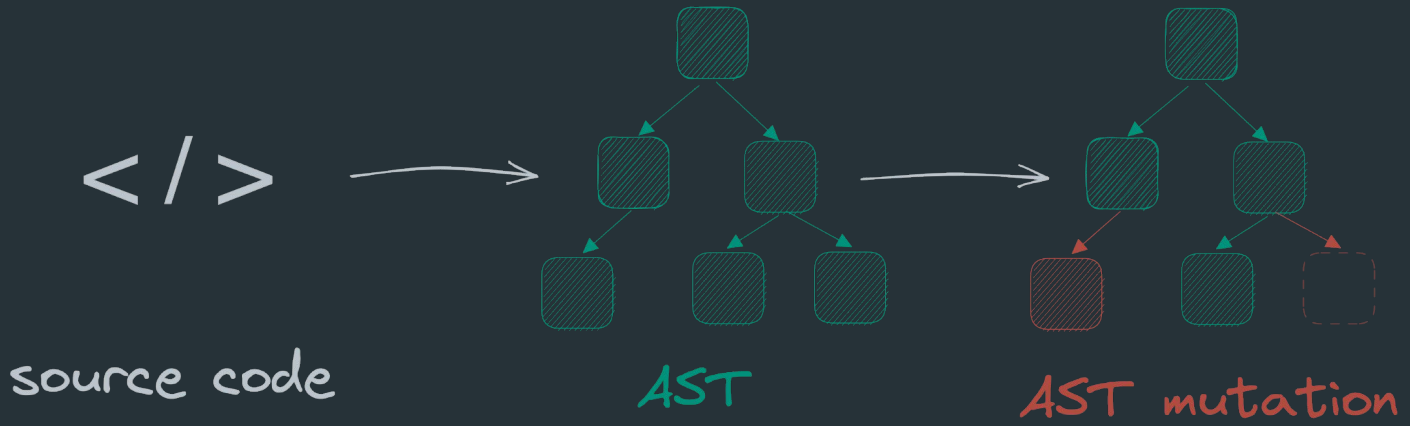
          name: "greet"
        }
        params: [ ]
        body: BlockStatement {
          - body: [
            - ReturnStatement {
                - argument: Literal {
                    value: "Hi Berlin 👋!"
                  }
              }
            ]
        }
        expression: false
        generator: false
        async: false
      }
  ]
  sourceType: "module"
}
```

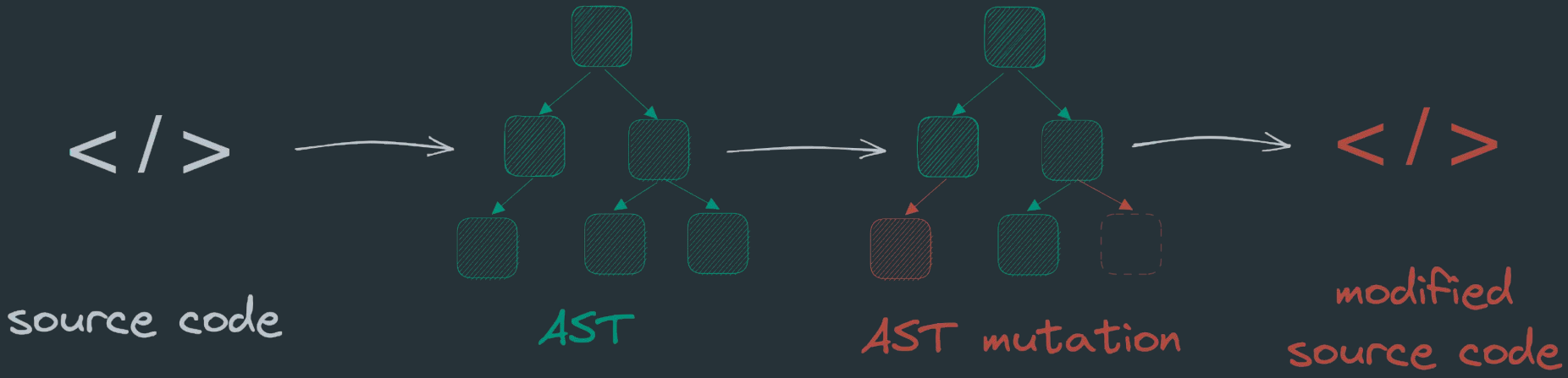
Abstract Syntax Tree (AST)



AST mutation



AST to source code



Toast.jsx

```
- import { Card, Button, Text } from '@mp/design-system';
+ import { Card, Button, Text } from '@mp/design-system';

export const Toast = ({ message, onClick }) => {
  return (
    <Card>
        <Text>{message}</Text>
-       <PrimaryButton onClick={onClick}>
+       <Button kind="primary" onClick={onClose}>
            Close
 -      </PrimaryButton>
 +      </Button>
    </Card>
  )
}
```

JScodeshift

```
npx jscodeshift -t transform.js Toast.jsx
```

JScodeshift

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JScodeshift

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npx jscodeshift -t transform.js Toast.jsx
```

transform.js

```
export default function transform(fileInfo, api, options) {
  const j = api.jscodeshift;
  const ast = j(fileInfo.source);

  ast
    .find(j.ImportDeclaration, { source: { value: "@mp/design-system" } })
    .find(j.ImportSpecifier)
    .filter((path) => path.node.imported.name === "PrimaryButton")
    .replaceWith(j.importSpecifier(j.identifier("Button")));

  ast
    .find(j.JSXElement)
    .filter(path => path.value.openingElement.name.name === "PrimaryButton")
    .forEach(element => {
      const newEl = j.jsxElement(
        j.jsxOpeningElement(j.jsxIdentifier("Button"), [
          j.jsxAttribute(j.jsxIdentifier("kind"), j.stringLiteral("primary")),
          ...element.node.openingElement.attributes
        ]),
        j.jsxClosingElement(j.jsxIdentifier("Button")),
        element.node.children
      );

      j(element).replaceWith(newEl);
    });

  return ast.toSource();
}
```

transform.js - API

```
export default function transform(fileInfo, api, options) {



}
```

transform.js - to AST and back

```
export default function transform(fileInfo, api, options) {
  const j = api.jscodeshift;
  const ast = j(fileInfo.source); // source code to AST

  /* AST mutations here */

  return ast.toSource();  // AST to source code
}
```

transform.js - mutations

```
export default function transform(fileInfo, api, options) {
  const j = api.jscodeshift;
  const ast = j(fileInfo.source); // source code to AST

  /* AST mutations here */

  return ast.toSource();  // AST to source code
}
```

Toast.tsx

```
import { Card, PrimaryButton, Text } from '@mp/design-system';
```

Toast.tsx

```
import { Card, PrimaryButton, Text } from '@mp/design-system';
```

```
...
- ImportDeclaration {
  - source: {
      value: "@mp/design-system"
    }
  - specifiers: [
      + ImportSpecifier {...}
      - ImportSpecifier {
        - imported {
            name: "PrimaryButton"
          }
        }
      + ImportSpecifier {...}
    ]
  }
```

transform.js - update import

```
import { Card, PrimaryButton, Text } from '@mp/design-system';

export default function transform(fileInfo, api, options) {
  /*...*/




  /*...*/
}
```

transform.js

```
import { Card, PrimaryButton, Text } from '@mp/design-system';
```

```
export default function transform(fileInfo, api, options) {
  /*...*/

  ast
    .find(j.ImportDeclaration, { source: { value: "@mp/design-system" }})
    .find(j.ImportSpecifier)
    .filter((path) => path.node.imported.name === "PrimaryButton")
    .replaceWith(j.importSpecifier(j.identifier("Button")));


  /*...*/
}
```

transform.js

```
import { Card, PrimaryButton, Text } from '@mp/design-system';
```

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export default function transform(fileInfo, api, options) {
  /*...*/

  ast
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  /*...*/
}
```

transform.js

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    .replaceWith(j.importSpecifier(j.identifier("Button")));


  /*...*/
}
```

transform.js

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export default function transform(fileInfo, api, options) {
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    .find(j.ImportSpecifier)
    .filter((path) => path.node.imported.name === "PrimaryButton")
    .replaceWith(j.importSpecifier(j.identifier("Button")));


  /*...*/
}
```

transform.js

```
<PrimaryButton onClick={onClose}>Close<PrimaryButton>
```

```
export default function transform(fileInfo, api, options) {
  /*...*/









  /*...*/
}
```

transform.js

```
<PrimaryButton onClick={onClose}>Close<PrimaryButton>
```

```
export default function transform(fileInfo, api, options) {
  /*...*/

  ast
    .find(j.JSXElement)
    .filter(p => p.value.openingElement.name.name ==="PrimaryButton")
    .forEach(element => {

    });


  /*...*/
}
```

transform.js

```
<PrimaryButton onClick={onClose}>Close<PrimaryButton>
```

```
export default function transform(fileInfo, api, options) {
  /*...*/

  ast
    .find(j.JSXElement)
    .filter(p => p.value.openingElement.name.name ==="PrimaryButton")
    .forEach(element => {

    });


  /*...*/
}
```

transform.js

</>

```
export default function transform(fileInfo, api, options) {
  /*...*/
  const newEl = j.jsxElement(
    j.jsxOpeningElement(j.jsxIdentifier("Button"), [
      j.jsxAttribute(j.jsxIdentifier("kind"), j.stringLiteral("primary")),
      ...element.node.openingElement.attributes
    ]),
    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
  );
  j(element).replaceWith(newEl);
  /*...*/
}
```

transform.js

```
<Button />
```

```
export default function transform(fileInfo, api, options) {
  /*...*/
  const newEl = j.jsxElement(
    j.jsxOpeningElement(j.jsxIdentifier("Button"), [
      j.jsxAttribute(j.jsxIdentifier("kind"), j.stringLiteral("primary")),
      ...element.node.openingElement.attributes
    ]),
    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
  );
  j(element).replaceWith(newEl);
  /*...*/
}
```

transform.js

```
<Button kind="primary" />
```

```
export default function transform(fileInfo, api, options) {
  /*...*/
  const newEl = j.jsxElement(
    j.jsxOpeningElement(j.jsxIdentifier("Button"), [
      j.jsxAttribute(j.jsxIdentifier("kind"), j.stringLiteral("primary")),
      ...element.node.openingElement.attributes
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    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
  );
  j(element).replaceWith(newEl);
  /*...*/
}
```

transform.js

```
<Button kind="primary" onClick={onClose} />
```

```
export default function transform(fileInfo, api, options) {
  /*...*/
  const newEl = j.jsxElement(
    j.jsxOpeningElement(j.jsxIdentifier("Button"), [
      j.jsxAttribute(j.jsxIdentifier("kind"), j.stringLiteral("primary")),
      ...element.node.openingElement.attributes
    ]),
    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
  );
  j(element).replaceWith(newEl);
  /*...*/
}
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transform.js

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<Button kind="primary" onClick={onClose}></Button>
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      ...element.node.openingElement.attributes
    ]),
    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
  );
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transform.js

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<Button kind="primary" onClick={onClose}>Close</Button>
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    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
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}
```

transform.js

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<Button kind="primary" onClick={onClose}>Close</Button>
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    j.jsxOpeningElement(j.jsxIdentifier("Button"), [
      j.jsxAttribute(j.jsxIdentifier("kind"), j.stringLiteral("primary")),
      ...element.node.openingElement.attributes
    ]),
    j.jsxClosingElement(j.jsxIdentifier("Button")),
    element.node.children
  );
  j(element).replaceWith(newEl);
  /*...*/
}
```

JScodeshift

```
npx jscodeshift -t transform.js src/**/*
```

Automation + codemod

Automation + codemod

Takeways

Automate repetitive tasks

Use power of AST for code changes

Come home and write your first codemod*

*if haven't done it yet

Thank you!

@mrkosima