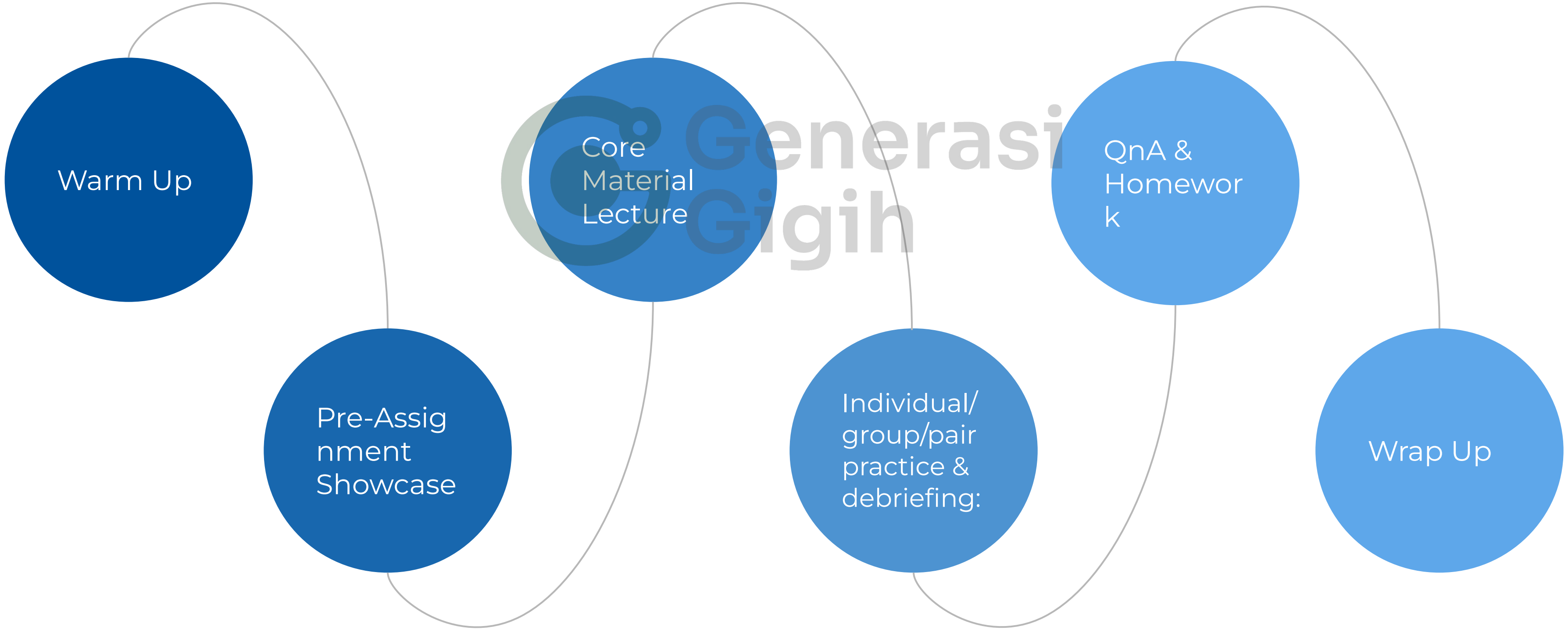
Full Stack Engineer

Module 4 Session 2: Component Part 2, Props, and Conditional Rendering

Our Agenda


Warm Up
Pre-Assig nment Showcase
Core Material Lecture
Individual/ group/pair practice & debriefing:
QnA & Homewor k
Wrap Up

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Let's Warm Up!

What is JSX and Component? How to write the code with component and JSX?

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Showcase Time!

Let's Discuss

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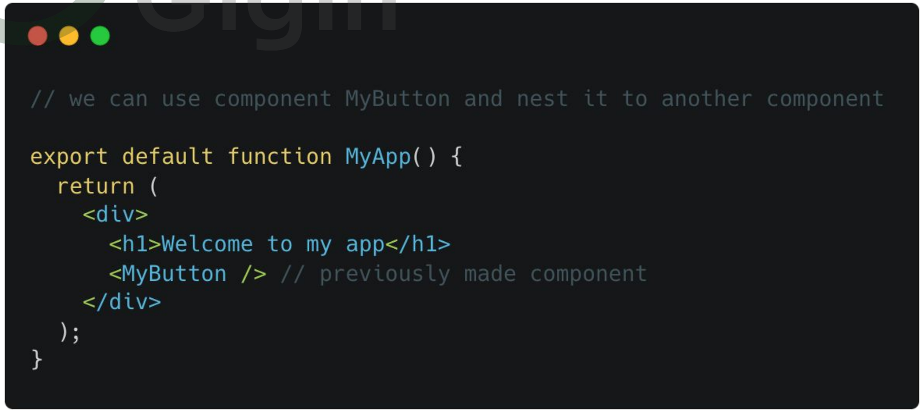
Props

Communicating between components

Intermezzo

Remember parent component and child component? (previously mentioned when learning how to nest component)

Please explain



```
// we can use component MyButton and nest it to another component

export default function MyApp() {
  return (
    <div>
      <h1>Welcome to my app</h1>
      <MyButton /> // previously made component
    </div>
  );
}
```

Part 1: Intro to Props

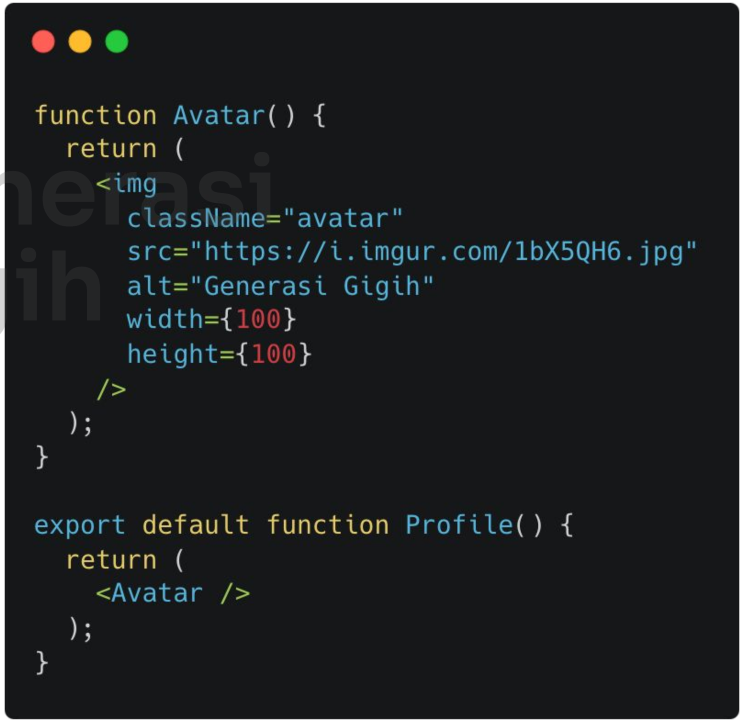
- React components use props to communicate with each other.
- Every parent component can **pass some information to its child** components by giving them props
- Props are **immutable**, meaning its values cannot be changed
- Props can be any Javascript values (objects, array, functions, etc)

Part 2: Parent and Child Components (no props)

read first

- Profile – parent component
- Avatar – child component of Profile component

- No props on Avatar component (only calling <Avatar and then close />)



```
function Avatar() {
  return (
    <img
      className="avatar"
      src="https://i.imgur.com/1bX5QH6.jpg"
      alt="Generasi Gigih"
      width={100}
      height={100}
    />
  );
}

export default function Profile() {
  return (
    <Avatar />
  );
}
```

Part 3: Parent and Child Components (with props)

Steps to use props:

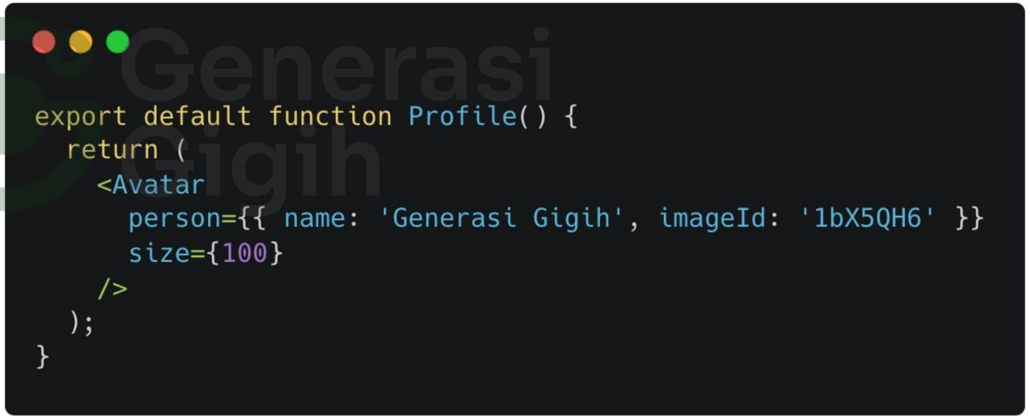
1. Pass props to child component
2. Read/ retrieve props inside the child component

We'll see one by one..

Part 3.1: Pass props to child component

Profile is passing 2 props to **Avatar**:

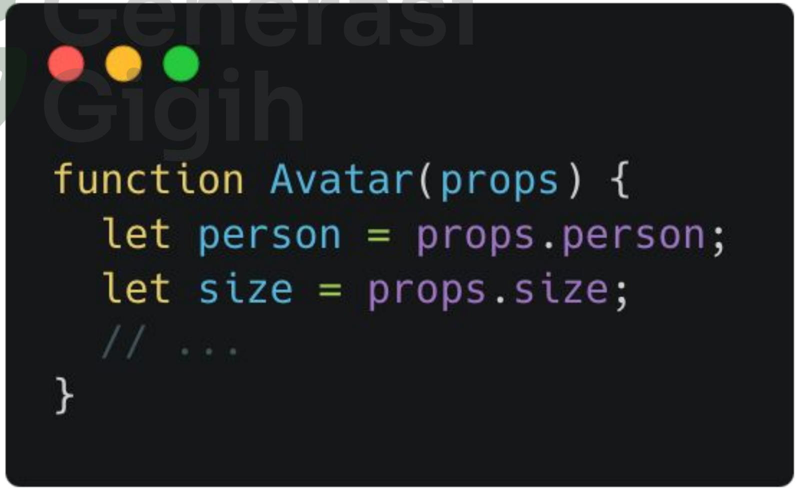
1. Person (object)
2. Size (number)



```
export default function Profile() {
  return (
    <Avatar
      person={{ name: 'Generasi Gigih', imageId: '1bX5QH6' }}
      size={100}
    />
  );
}
```

Part 3.2: Read props inside child component

Person and size can now be read inside Avatar component

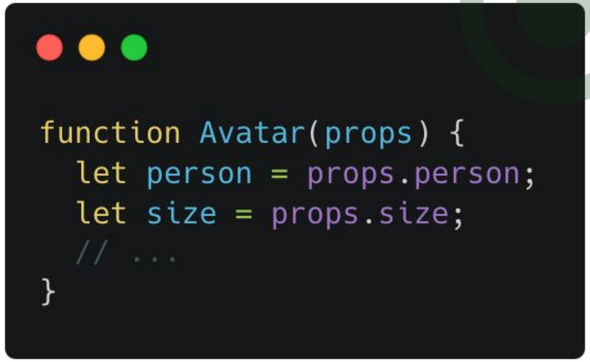


```
function Avatar(props) {
  let person = props.person;
  let size = props.size;
  // ...
}
```

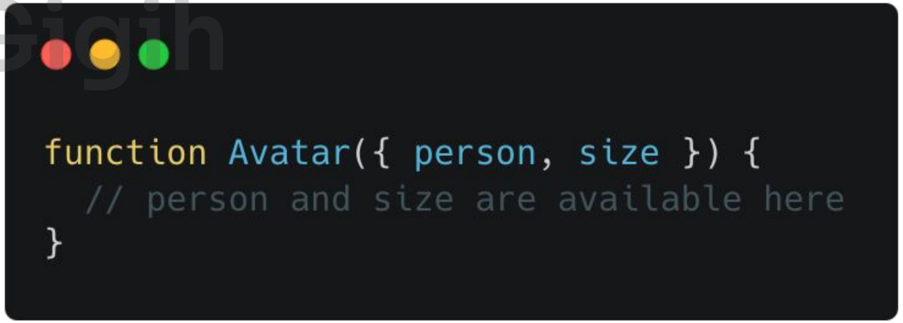
Intermezzo

Remember syntax to destructure an object? (lesson on module 1)

How if we want to destructure props right away?



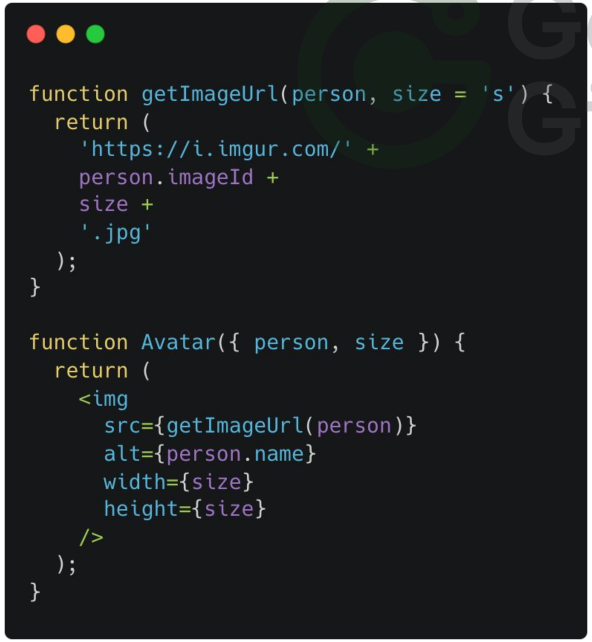
```
function Avatar(props) {
  let person = props.person;
  let size = props.size;
  // ...
}
```



```
function Avatar({ person, size }) {
  // person and size are available here
}
```

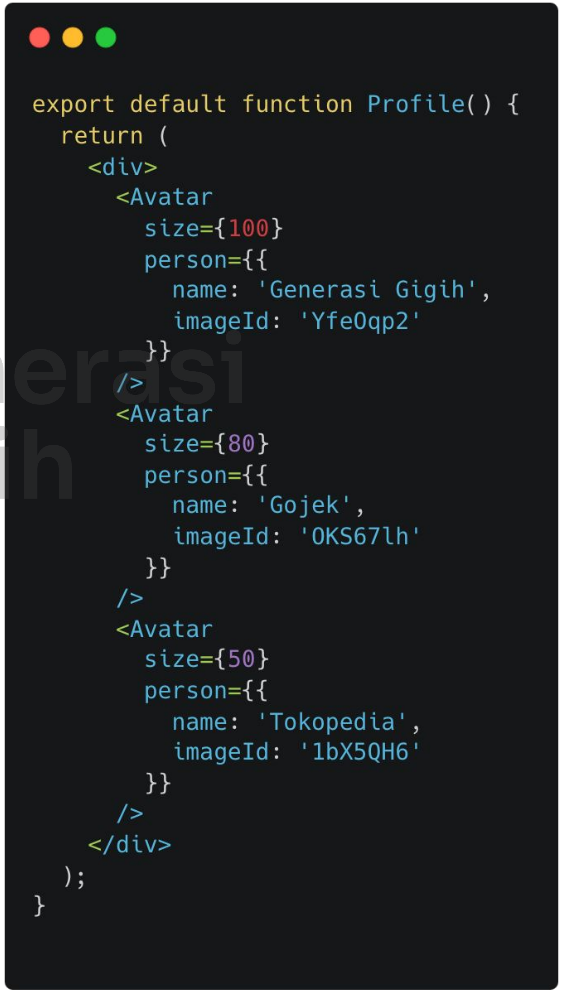
If you forget please read again:
https://developer.mozilla.org/en-US/docs/Web/JavaScript/Reference/Operators/Destructuring_assignment#Unpacking_fields_from_objects_passed_as_a_function_parameter

Part 3.3: Display multiple child component with different props (read first)



```
function getImageUrl(person, size = 's') {
  return (
    'https://i.imgur.com/' +
    person.imageId +
    size +
    '.jpg'
  );
}

function Avatar({ person, size }) {
  return (
    <img
      src={getImageUrl(person)}
      alt={person.name}
      width={size}
      height={size}
    />
  );
}
```

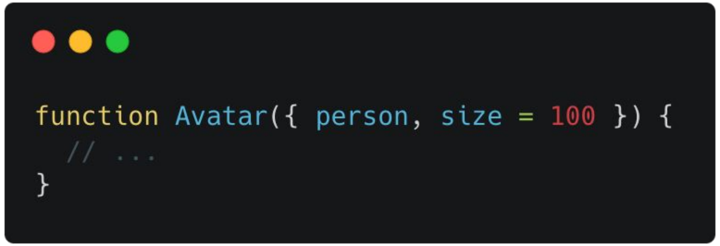


```
export default function Profile() {
  return (
    <div>
      <Avatar
        size={100}
        person={{
          name: 'Generasi Gigih',
          imageId: 'YfeOqp2'
        }}
      />
      <Avatar
        size={80}
        person={{
          name: 'Gojek',
          imageId: 'OKS67lh'
        }}
      />
      <Avatar
        size={50}
        person={{
          name: 'Tokopedia',
          imageId: '1bX5QH6'
        }}
      />
    </div>
  );
}
```

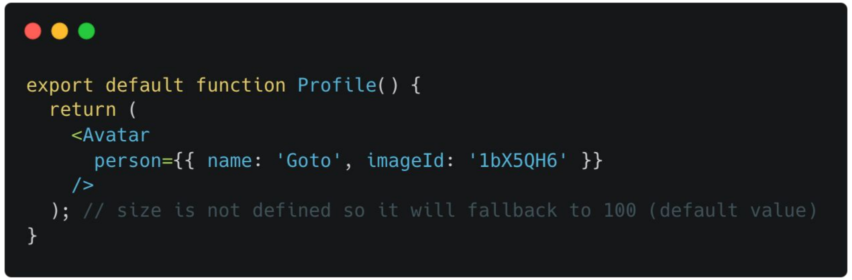
Part 3.4: Default value for props

If you want to give a prop a default value to fall back on **when no value is specified**:

1. Destructure
2. Put = and the default value



```
function Avatar({ person, size = 100 }) {
  // ...
}
```



```
export default function Profile() {
  return (
    <Avatar
      person={{ name: 'Goto', imageId: '1bX5QH6' }}
    />
  ); // size is not defined so it will fallback to 100 (default value)
}
```

Part 3.5: Props Recap

- To pass props, add them to the JSX, just like you would with HTML attributes.
- To read props, use the function Avatar({ person, size }) destructuring syntax.
- You can specify a default value like size = 100, which is used for missing and undefined props.
- Props are **read-only snapshots** in time: every render receives a new version of props.
- **You can’t change props**. When you need interactivity, you’ll need to set state (will learn later)

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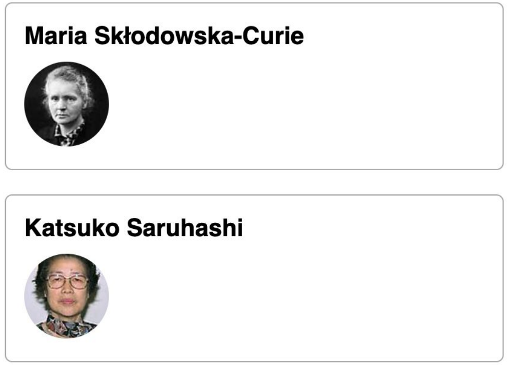
Hands on

Continue from session 1 exercise, **bold is new on session 2**:

1. Create several objects that contains name and image url for avatar
2. Create a **child** component that contains header and image called Avatar
3. **Create a parent component that call child components and pass objects as props to the child components** (child 1 object 1, child 2 object 2 and so on)
4. **Try to have one empty name and use *default props***
5. **Output: child components will be rendered x times based on how many objects previously made**


Maria Skłodowska-Curie

Katsuko Saruhashi

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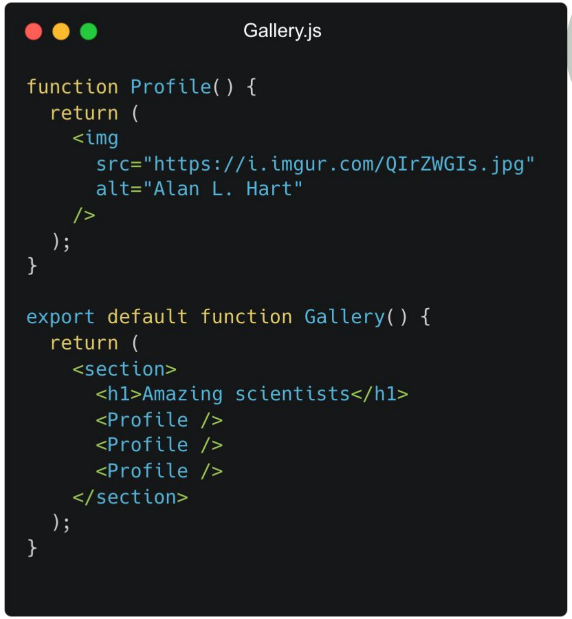
Default and Named Exports

More about exporting and importing components

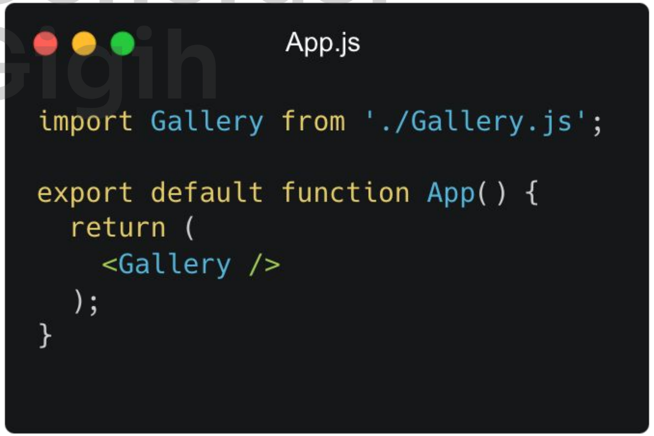
Intermezzo

Remember how to import and export component? Explain the code below


Gallery.js

```
function Profile() {
  return (
    <img
      src="https://i.imgur.com/QIrZWGIs.jpg"
      alt="Alan L. Hart"
    />
  );
}

export default function Gallery() {
  return (
    <section>
      <h1>Amazing scientists</h1>
      <Profile />
      <Profile />
      <Profile />
    </section>
  );
}
```


App.js

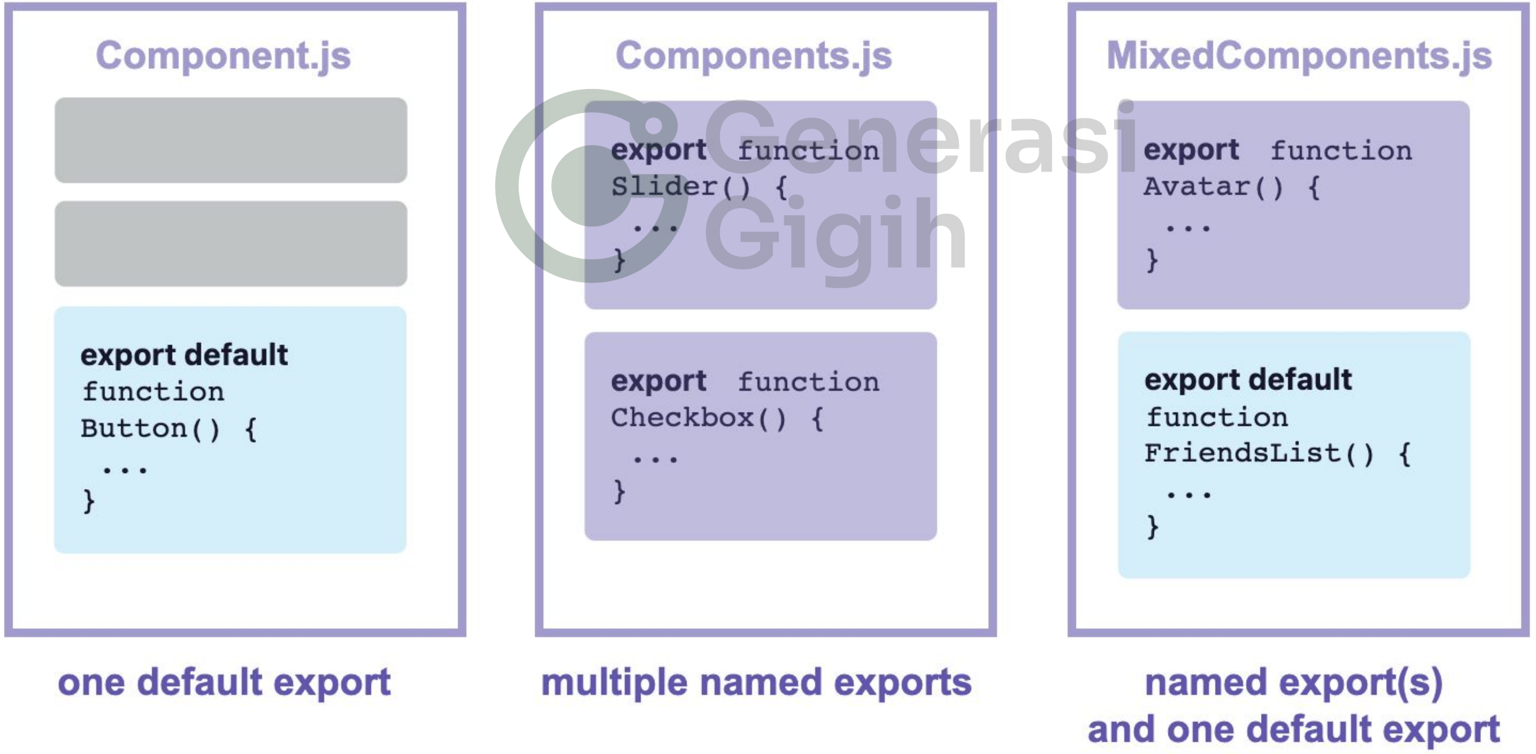
```
import Gallery from './Gallery.js';

export default function App() {
  return (
    <Gallery />
  );
}
```

Part 1: Default vs named export (1)

- Two primary ways to export values with JavaScript: **default exports** and **named exports** (our examples have only used default exports)
- A file can have **no more than one default export**, but it can have as many named exports as you like.
- People often use **default exports if the file exports only one component**, and use named exports if it exports multiple components and values.

Part 2: Default vs named export (2)



```
export default
function
Button() {
  ...
}
```

```
export  function
Slider() {
  ...
}
```

```
export  function
Checkbox() {
  ...
}
```

```
export  function
Avatar() {
  ...
}
```

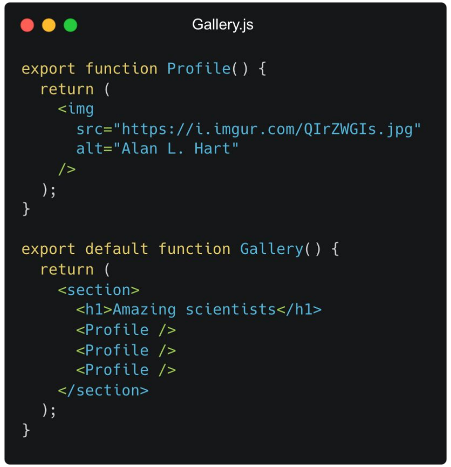
```
export default
function
FriendsList() {
  ...
}
```

Part 2: Default vs named export (3)

How to import components depends on how you export it

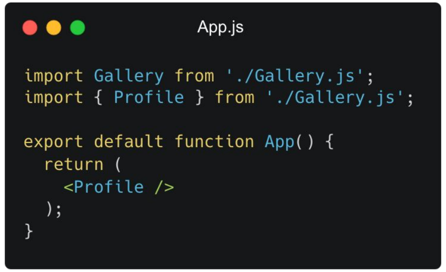
Syntax	Export statement	Import statement
Default	`export default function Button() {}`	`import Button from './Button.js';`
Named	`export function Button() {}`	`import { Button } from './Button.js';`

Part 5: Export and import multiple files (read first)


Gallery.js

```
export function Profile() {
  return (
    <img
      src="https://i.imgur.com/QIrZWGIs.jpg"
      alt="Alan L. Hart"
    />
  );
}

export default function Gallery() {
  return (
    <section>
      <h1>Amazing scientists</h1>
      <Profile />
      <Profile />
      <Profile />
    </section>
  );
}
```

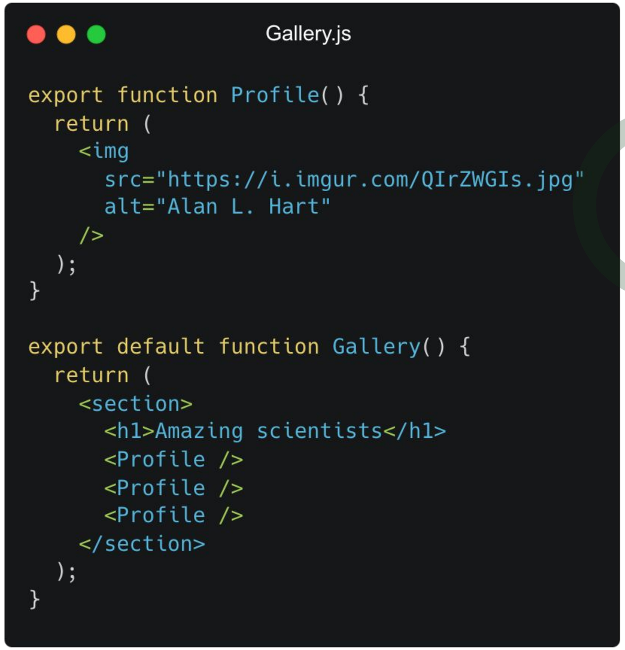

App.js

```
import Gallery from './Gallery.js';
import { Profile } from './Gallery.js';

export default function App() {
  return (
    <Profile />
  );
}
```

- Gallery.js:
  - **Exports** the Profile component as a named export called Profile.
  - **Exports** the Gallery component as a default export.
- App.js:
  - **Imports** Profile as a named import called Profile from Gallery.js.
  - **Imports** Gallery as a default import from Gallery.js.
  - **Exports** the root App component as a default export.

Exercise


Gallery.js

```
export function Profile() {
  return (
    <img
      src="https://i.imgur.com/QIrZWGIs.jpg"
      alt="Alan L. Hart"
    />
  );
}

export default function Gallery() {
  return (
    <section>
      <h1>Amazing scientists</h1>
      <Profile />
      <Profile />
      <Profile />
    </section>
  );
}
```

Raise your hand and type on chat:

- Syntax to import Profile from Gallery.js
- Syntax to import default export from Gallery.js

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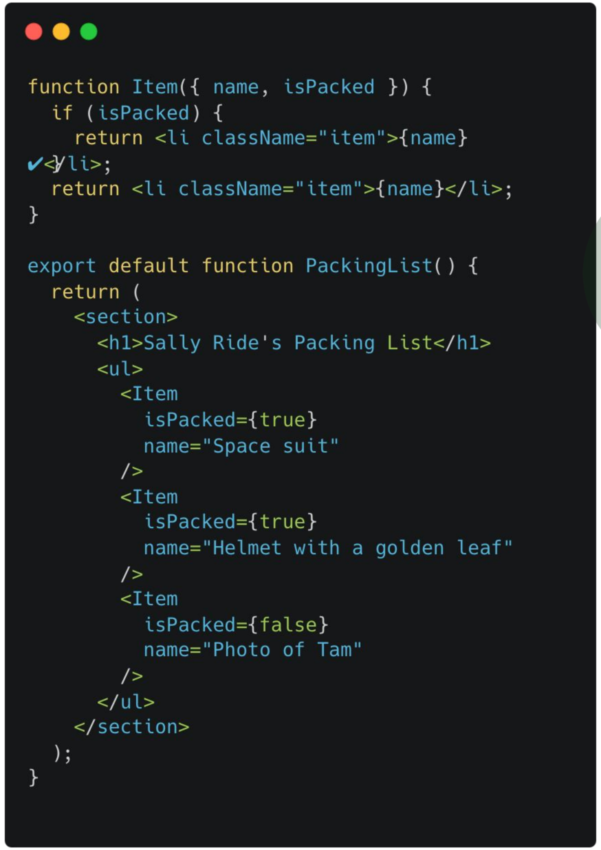
Conditional Rendering

Displaying components with conditions

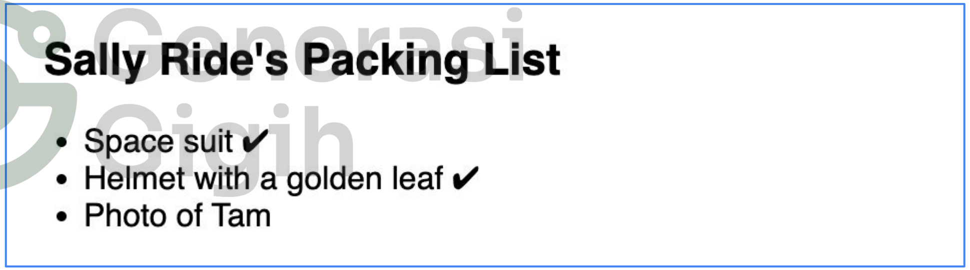
Conditional Rendering (read first)



```
function Item({ name, isPacked }) {
  if (isPacked) {
    return <li className="item">{name}
✔</li>;
  return <li className="item">{name}</li>;
}

export default function PackingList() {
  return (
    <section>
      <h1>Sally Ride's Packing List</h1>
      <ul>
        <Item
          isPacked={true}
          name="Space suit"
        />
        <Item
          isPacked={true}
          name="Helmet with a golden leaf"
        />
        <Item
          isPacked={false}
          name="Photo of Tam"
        />
      </ul>
    </section>
  );
}
```

This code will render:

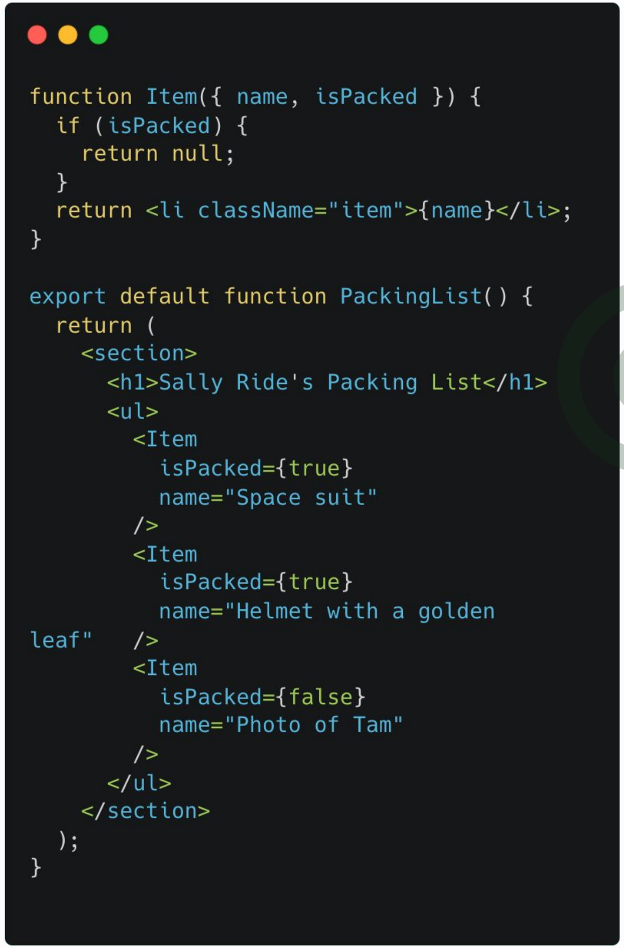


Sally Ride's Packing List

- Space suit ✔
- Helmet with a golden leaf ✔
- Photo of Tam

Please take a look at this code

✔ is an example for conditional rendering. If the condition is true it will be rendered.

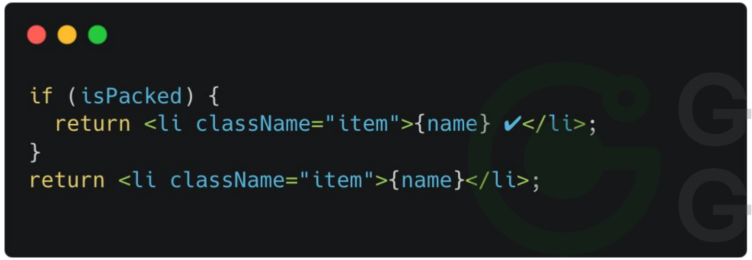


```
function Item({ name, isPacked }) {
  if (isPacked) {
    return null;
  }
  return <li className="item">{name}</li>;
}

export default function PackingList() {
  return (
    <section>
      <h1>Sally Ride's Packing List</h1>
      <ul>
        <Item
          isPacked={true}
          name="Space suit"
        />
        <Item
          isPacked={true}
          name="Helmet with a golden
leaf"    />
        <Item
          isPacked={false}
          name="Photo of Tam"
        />
      </ul>
    </section>
  );
}
```

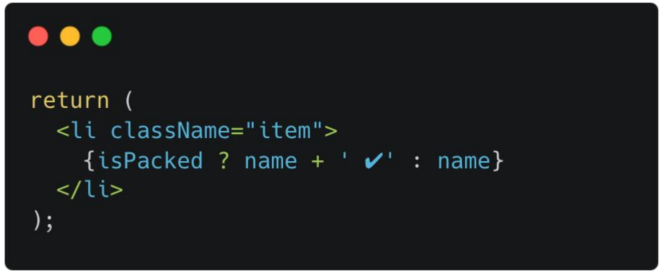
What will be the output of this code?

Conditional ternary operator (:)



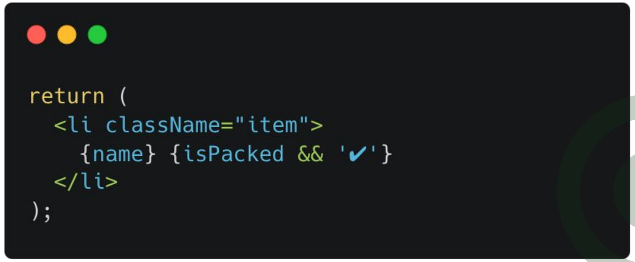
```
if (isPacked) {
  return <li className="item">{name} ✔</li>;
}
return <li className="item">{name}</li>;
```

Both are completely equivalent



```
return (
  <li className="item">
    {isPacked ? name + ' ✔' : name}
  </li>
);
```

Logical AND operator (&&)



```
return (
  <li className="item">
    {name} {isPacked && '✔'}
  </li>
);
```

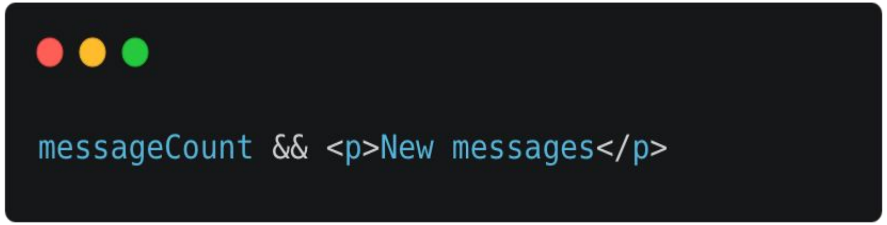
You can read this as "if isPacked, then (&&) render the checkmark, otherwise, render nothing".

- A JavaScript && expression returns the value of its right side (the checkmark) if the left side (our condition) **is true**.

- If the condition is false, the whole expression becomes false. React considers false as a "hole" in the JSX tree, just like null or undefined, and **doesn't render anything in its place**.

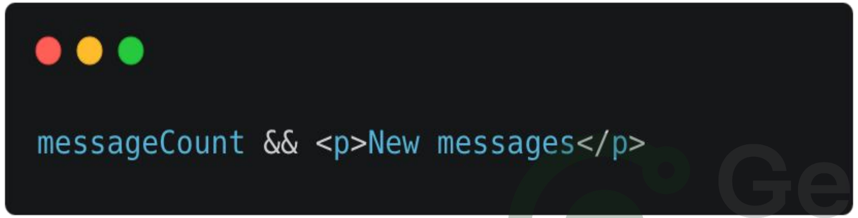
IMPORTANT NOTES

- Don’t put numbers on the left side of &&.
- To test the condition, JavaScript converts the left side to a boolean automatically.
- If the left side is 0, then the whole expression gets that value (0), and
- React will happily **render 0** rather than nothing.



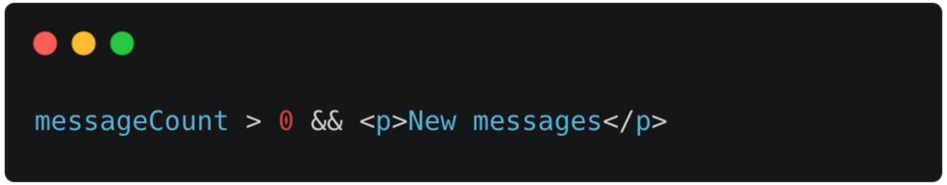
```
messageCount && <p>New messages</p>
```

What is a more correct way to write this expression? Answer on next slide



```
messageCount && <p>New messages</p>
```

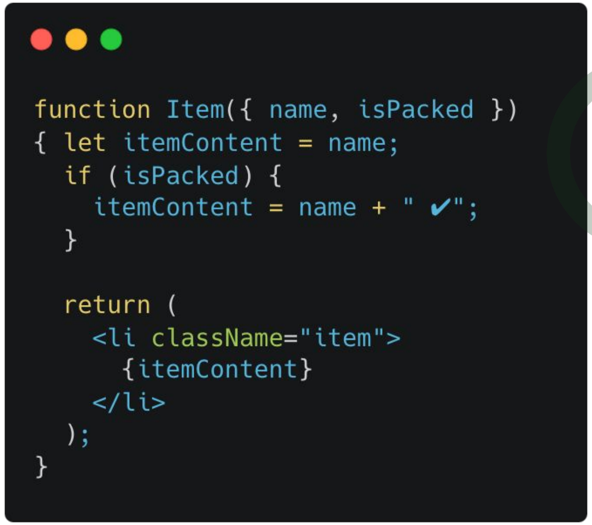
Wrong



```
messageCount > 0 && <p>New messages</p>
```

Right

Using variable



```
function Item({ name, isPacked })
{ let itemContent = name;
  if (isPacked) {
    itemContent = name + " ✔";
  }

  return (
    <li className="item">
      {itemContent}
    </li>
  );
}
```

Please take a look at this code and try to understand it.

We can also conditionally assign a variable with JSX, then escape to JS and render the variable.

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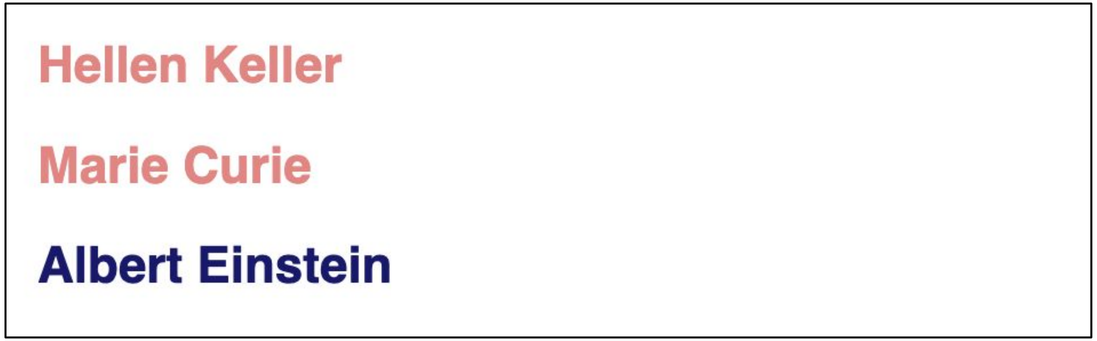
Hands on

Conditional rendering

1. Create several objects that contain name and gender (female or male)
2. Return **all the objects' name in h1**
3. If gender is female h1 will be in lightcoral color
4. If gender is male h1 will be in midnight blue color



Hellen Keller

Marie Curie

Albert Einstein

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What we learned

1. Props
2. Export and import component
3. Conditional rendering

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Q&A!

Homework

Create anything you like using what you’ve learned so far!

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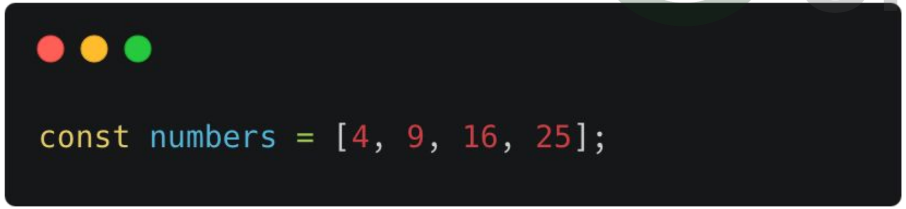
Warm up for session 3

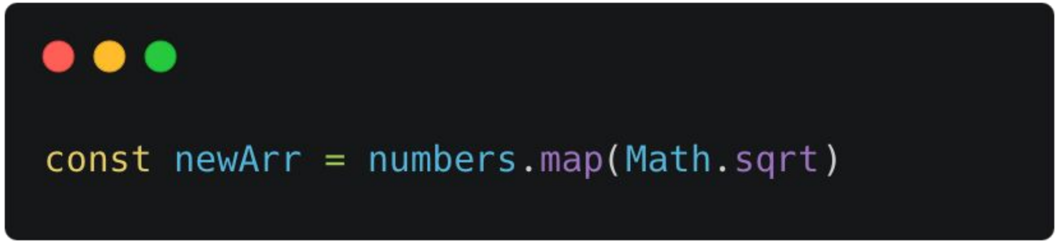
Part 1: JS map function

Remember how to display array of object using map?

Who can return a new array with the square root of all element values?
(you may google first what javascript function can return square root)



```
const numbers = [4, 9, 16, 25];
```

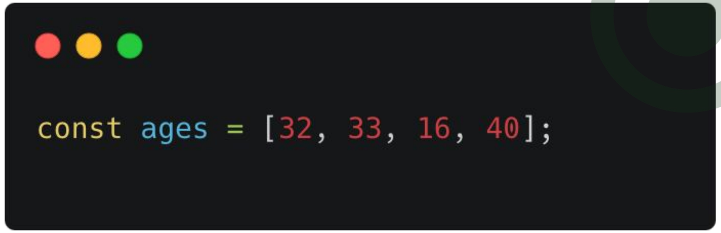


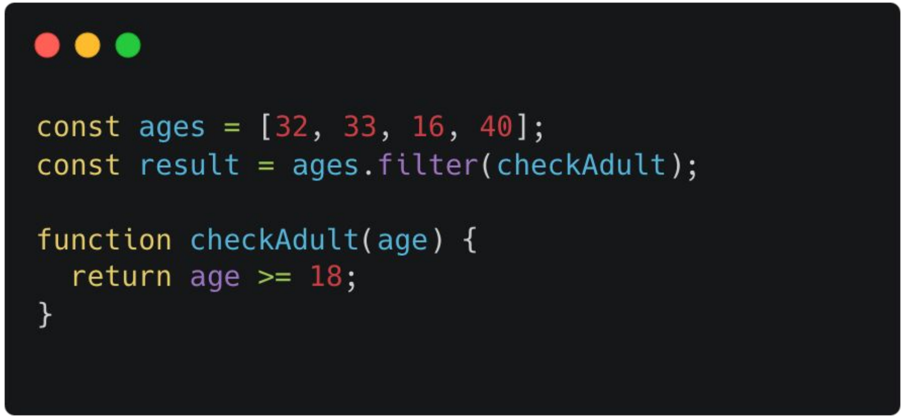
```
const newArr = numbers.map(Math.sqrt)
```

Part 2: JS filter function

Remember how to filter array?

Return an array of all values in ages[] that are 18 or over:


```javascript
const ages = [32, 33, 16, 40];
```


```javascript
const ages = [32, 33, 16, 40];
const result = ages.filter(checkAdult);

function checkAdult(age) {
  return age >= 18;
}
```

See you in the next session!