BUILDING FAST WEB UI WITH REACT

Pratik Patel @prpatel

- UI ONLY LIBRARY
- DEVELOPED AT FACEBOOK
- POWERS INSTAGRAM.COM

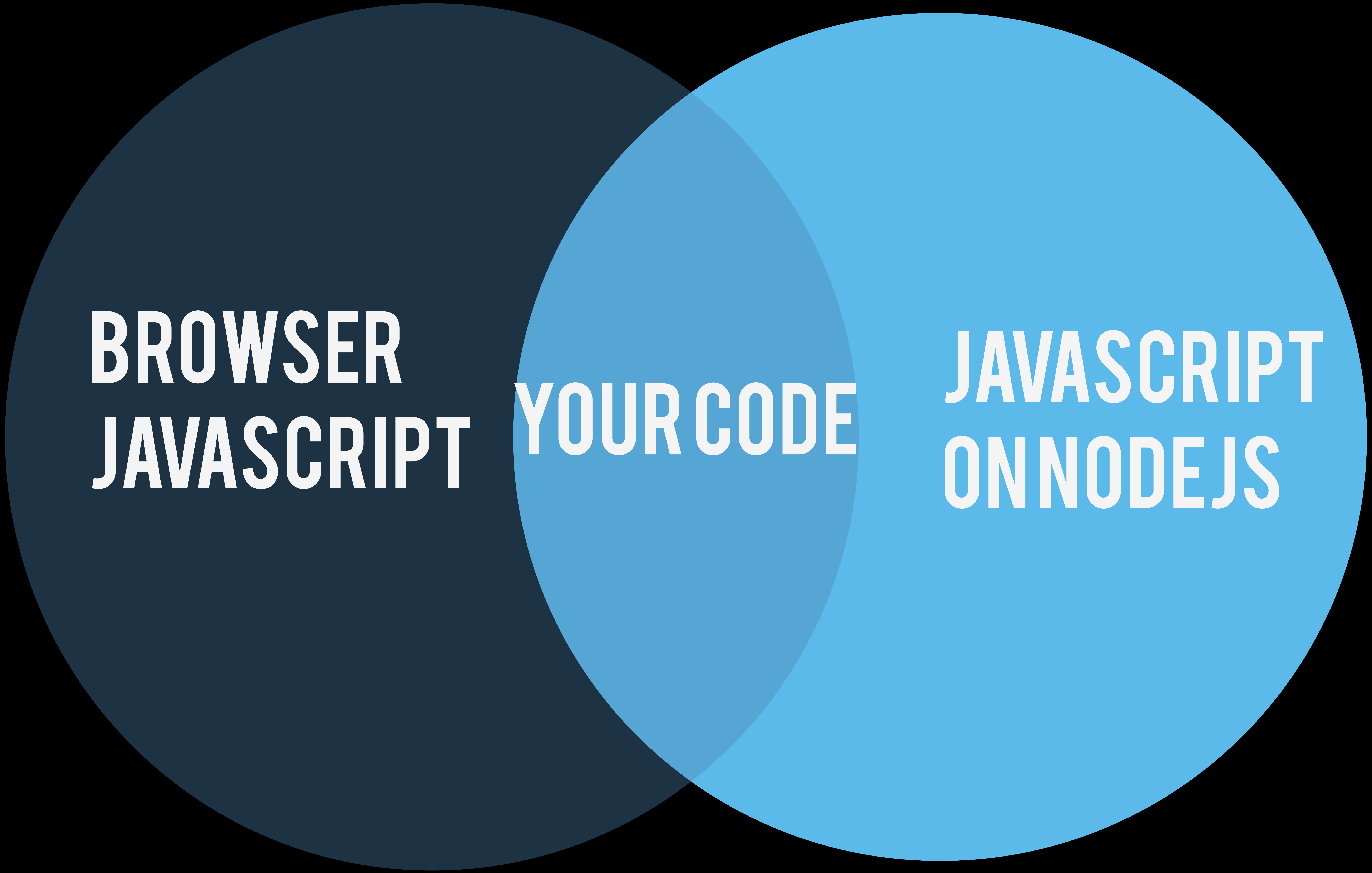
REACTJS CONCEPTS

CODE RUNS ON THE BROWSER

__OR__

THE SERVER

ISOMORPHIC


BROWSER JAVASCRIPT
YOUR CODE
JAVASCRIPT ON NODEJS

Allows great flexibility and performance management

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BUT THAT'S NOT THE MAIN REASON REACTJS IS FAST

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- VIRTUAL DOM
- SMART DIFF'ING OF DOM
- BATCHED DOM UPDATES

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TYPICAL BROWSER UPDATE

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PARSE
MARKUP
&
CSS

CREATE
RENDER
TREE

REFLOW
&
REPAINT

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REFLOW
&
REPAINT

DO THIS ALOT = SLOW

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ANY DOM UPDATE

MOVE / ANIMATE DOM

HIDE DOM NODE

STYLE CHANGES

MANAGE DOM STATE

VIRTUAL DOM

REDUCE NUMBER OF CHANGES TO BE APPLIED

SMART DIFF'ING OF DOM

REDUCE NUMBER OF REFLOWS / REPAINTS

BATCHED DOM UPDATES

REACT BASICS

COMPONENTS

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- BASIC BUILDING BLOCKS
- JSX
- JAVASCRIPT XML SYNTAX

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```
<script type="text/jsx">
/** @jsx React.DOM */
    React.renderComponent(
    <h1>Hello, world!</h1>,
    document.getElementById('myDiv')
    );
</script>
```

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- HTML-LIKE
- JSX DIFFERS FROM HTML
- [HTTP://FACEBOOK.GITHUB.IO/REACT/DOCS/JSX-GOTCHAS.HTML](http://facebook.github.io/react/docs/jsx-gotchas.html)

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WHY WRITE IN HTML-LIKE WHEN YOU CAN JUST WRITE CODE?

```
React.renderComponent(
  React.DOM.h1(null, 'Hello, world!'),
  document.getElementById('myDiv')
);
```

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REACT.RENDERCOMPONENT

1: COMPONENT TO RENDER

2: WHERE TO MOUNT

```
React.renderComponent(
 component, whereToAttachToDOM
);
```

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CUSTOM COMPONENTS: createClass

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```
var MyComponent =
React.createClass({
    render: function(){
        return (<h1>Hello, world!</h1>);
    }
});
```

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```
// use component
React.renderComponent(
   <MyComponent/>,
   document.getElementById('myDiv')
);
```

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DYNAMIC COMPONENTS: attributes

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```
var MyComponent = React.createClass({
    render: function(){
        return (<h1>Hello, {this.props.name}!</h1>);
    }
});

React.renderComponent(<MyComponent
name="Pratik" />,
document.getElementById('myDiv'));
```

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COMPONENT SPECIFICATIONS

- getInitalState
- getDefaultProps
- mixins

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MIXIN: sharing common lifecycle with cross-cutting concerns

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```
var LogMixin = {
  componentDidMount: function () {
    console.log("componentDidMount called!");    }
};

var ComponentTwo = React.createClass({
  mixins: [LogMixin],
..
```

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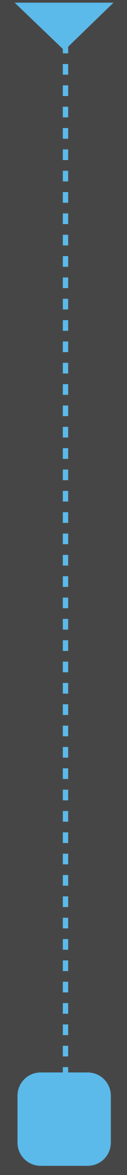
- componentWillRender
- componentDidMount
- componentWillUnmount



COMPONENTS HAVE STATE

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```
var MyComponent = React.createClass({
    getInitialState: function(){
        return {            count: 5        }
    },
    render: function(){
        return (
            <h1>{this.state.count}</h1>
        )
    }
});
```

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EVENTS ARE WRAPPED!

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- SyntheticEvent
- cross-browser wrapper
- wrap native event

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```
var Counter = React.createClass({
  incrementCount: function(){
    this.setState({
      count: this.state.count + 1
    });
  },
  getInitialState: function(){
    return {     count: 0     }
  },
```

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```
  render: function(){
    return (
      <div class="my-component">
        <h1>Count: {this.state.count}</h1>
        <button type="button"
onClick={this.incrementCount}>
Increment</button></div>    );  }
});
React.renderComponent(<Counter/>,
document.getElementById('mount-point'));
```

onClick={this.incrementCount}

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Changing the state causes a refresh: this.setState(...)

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TWITTER STREAM EXAMPLE

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- Browserify
- Socket.io
- Combo browser/server render

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```
module.exports = TweetsApp = React.createClass({
 render: function(){
   return (
     <div className="tweets-app">
       <Tweets tweets={this.state.tweets} />
       <Loader paging={this.state.paging}/>
       <NotificationBar count={this.state.count}
onShowNewTweets={this.showNewTweets}/>
     </div>
   )  }});
```

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```
/** @jsx React.DOM */
var React = require('react');
var Tweet = require('./Tweet.react.js');
module.exports = Tweets = React.createClass({
 render: function(){
    var content =
this.props.tweets.map(function(tweet){
   return (<Tweet key={tweet.twid} tweet={tweet} />)
  });
  return (<ul className="tweets">{content}</ul>)
}});
```

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```
module.exports = Tweet = React.createClass({
  render: function(){
    var tweet = this.props.tweet;
    return (
<li className={"tweet" + (tweet.active ? ' active' : '')}>
        <img src={tweet.avatar} className="avatar"/>
        <blockquote>
          <cite>
            <a href={"http://www.twitter.com/" +
tweet.screenname}>{tweet.author}</a>
```

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ISOMORPHIC

```
var JSX = require('node-jsx').install(),
  React = require('react'),
  TweetsApp = require('./components/
TweetsApp.react'),
  Tweet = require('./models/Tweet');
```

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```
var markup = React.renderComponentToString(
    TweetsApp({        tweets: tweets        })
  );
  // Render our 'home' template
  res.render('home', {
    markup: markup,  // Pass rendered react markup
    state: JSON.stringify(tweets)
  });
```

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- Generate initial page on server
- New data rendered in browser
- “infinite scroll” on browser

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BROWSER

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```
// TweetApps.react.js (main component)
 showNewTweets: function(){
  var updated = this.state.tweets;
  updated.forEach(function(tweet){
    tweet.active = true;
  });
  // Forces render!
  this.setState({tweets: updated, count: 0});
 },
```

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setState(...) invokes render for component and all sub components!

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WON'T THAT BE SUPER SLOW?

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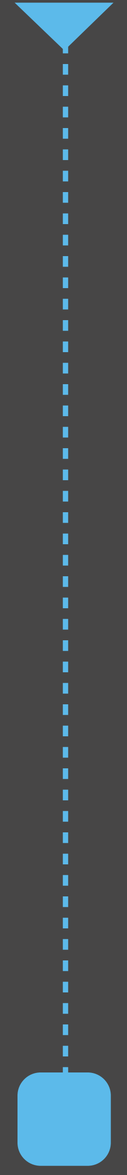
NO,
NOT IN
REACT

REMEMBER THE VIRTUAL DOM AND THE COOL STUFF IT DOES!

- VIRTUAL DOM
- SMART DIFF'ING OF DOM
- BATCHED DOM UPDATES



SERVER

```
var markup = React.renderComponentToString(
    TweetsApp({        tweets: tweets        })
  );
  // Render our 'home' template
  res.render('home', {
    markup: markup,  // Pass rendered react markup
    state: JSON.stringify(tweets)
  });
```

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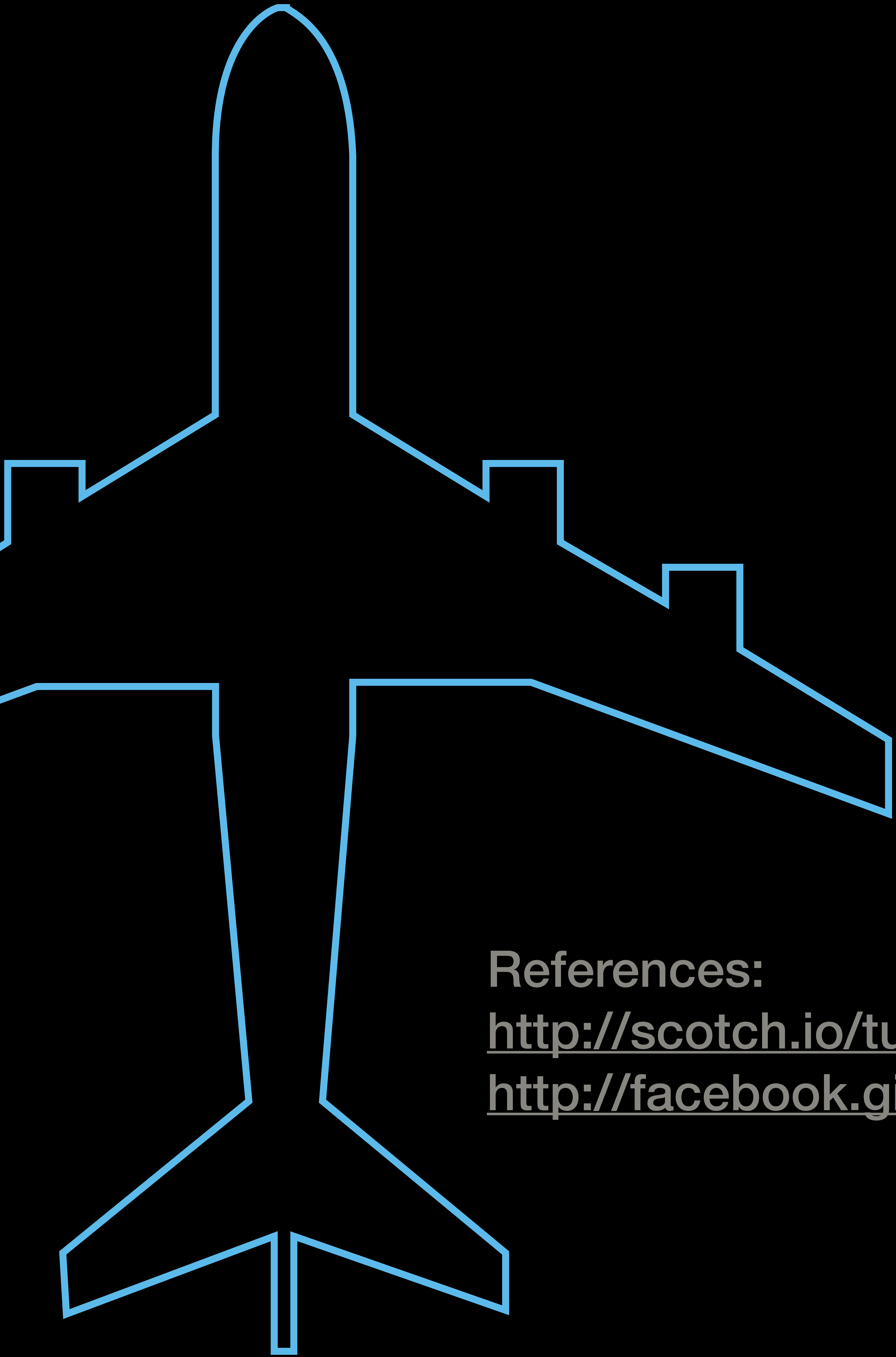

THANK YOU

References:
http://scotch.io/tutorials/javascript/learning-react-getting-started-and-concepts
http://facebook.github.io/react/index.html

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