

Modules



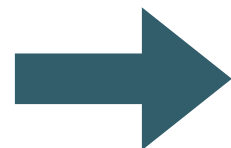
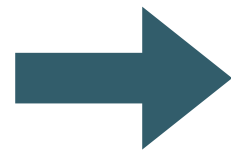
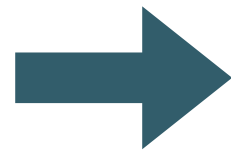
Javascript Modules

- To structure an application coherently, the backend consists of separate Javascript files.
- Objects declared in these files must be
 - exported by one file
 - imported by another
- In order to keep each module focused on a specific responsibility

Example

standalone.js

- 2 separate object defined in a single file
- Methods called on these objects at the end of the file

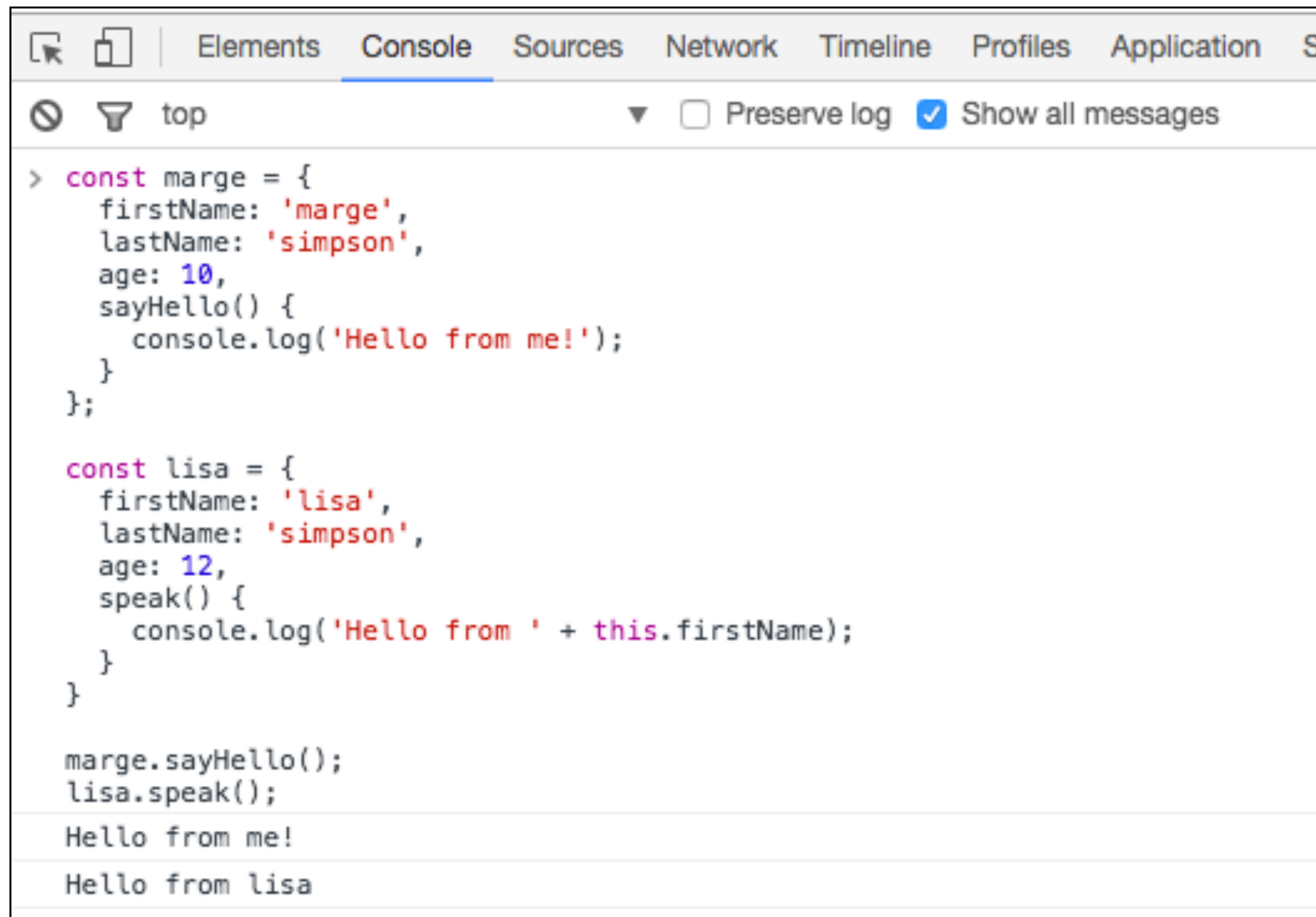


```
const marge = {
  firstName: 'marge',
  lastName: 'simpson',
  age: 10,
  sayHello() {
    console.log('Hello from me!');
  }
};

const lisa = {
  firstName: 'lisa',
  lastName: 'simpson',
  age: 12,
  speak() {
    console.log('Hello from ' + this.firstName);
  }
}

marge.sayHello();
lisa.speak();
```

In Chrome JS Console



The screenshot shows the Chrome DevTools Console with the 'Console' tab selected. The interface includes a toolbar with a close button, a filter icon, and a 'top' link. There are also checkboxes for 'Preserve log' (unchecked) and 'Show all messages' (checked). The console contains two JavaScript code blocks. The first block defines a 'marge' object with properties 'firstName', 'lastName', 'age', and a 'sayHello' method that logs 'Hello from me!'. The second block defines a 'lisa' object with similar properties and a 'speak' method that logs 'Hello from ' followed by the first name. Below the code, the console shows the output of these methods: 'Hello from me!' and 'Hello from lisa'.

```
> const marge = {
  firstName: 'marge',
  lastName: 'simpson',
  age: 10,
  sayHello() {
    console.log('Hello from me!');
  }
};

const lisa = {
  firstName: 'lisa',
  lastName: 'simpson',
  age: 12,
  speak() {
    console.log('Hello from ' + this.firstName);
  }
}

marge.sayHello();
lisa.speak();
```

Hello from me!

Hello from lisa

Modularise the Program

standalone.js

```
const marge = {
  firstName: 'marge',
  lastName: 'simpson',
  age: 10,
  sayHello() {
    console.log('Hello from me!');
  }
};

const lisa = {
  firstName: 'lisa',
  lastName: 'simpson',
  age: 12,
  speak() {
    console.log('Hello from '
               + this.firstName);
  }
}

marge.sayHello();
lisa.speak();
```

marge.js

```
const marge = {
  firstName: 'marge',
  lastName: 'simpson',
  age: 10,
  sayHello() {
    console.log('Hello from me!');
  }
};
```

lisa.js

```
const lisa = {
  firstName: 'lisa',
  lastName: 'simpson',
  age: 12,
  speak() {
    console.log('Hello from '
               + this.firstName);
  }
}
```

main.js

```
marge.sayHello();
lisa.speak();
```

http://requirejs.org/



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Why Web Modules ?

Why AMD ?

Requirements 📊

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```
/* ---
```

RequireJS is a JavaScript file and module loader. It is optimized for in-browser use, but it can be used in other JavaScript environments, like Rhino and Node. Using a modular script loader like RequireJS will improve the speed and quality of your code.

IE 6+ compatible ✓

Firefox 2+ compatible ✓

Safari 3.2+ compatible ✓

Chrome 3+ compatible ✓

Opera 10+ compatible ✓

Get started then check out the API.

```
--- */
```

Modularise the Program

- These three modules:
 - marge.js
 - lisa.js
 - main.js
- Are completely separate.
- main.js cannot use marge or lisa objects

marge.js

```
const marge = {  
  firstName: 'marge',  
  lastName: 'simpson',  
  age: 10,  
  sayHello() {  
    console.log('Hello from me!');  
  }  
};
```

lisa.js

```
const lisa = {  
  firstName: 'lisa',  
  lastName: 'simpson',  
  age: 12,  
  speak() {  
    console.log('Hello from ' + this.firstName);  
  }  
}
```

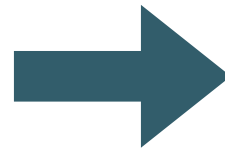
main.js



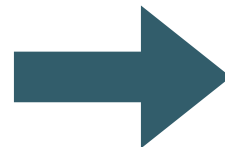
```
marge.sayHello();  
lisa.speak();
```

module.exports

module.exports makes
the listed object available
to other modules



```
marge.js
const marge = {
  firstName: 'marge',
  lastName: 'simpson',
  age: 10,
  sayHello() {
    console.log('Hello from me!');
  }
};
module.exports = marge;
```



```
lisa.js
const lisa = {
  firstName: 'lisa',
  lastName: 'simpson',
  age: 12,
  speak() {
    console.log('Hello from ' + this.firstName);
  }
};
module.exports = lisa;
```


require

marge.js

```
const marge = {  
  firstName: 'marge',  
  lastName: 'simpson',  
  age: 10,  
  sayHello() {  
    console.log('Hello from me!');  
  }  
};  
  
module.exports = marge;
```

lisa.js

```
const lisa = {  
  firstName: 'lisa',  
  lastName: 'simpson',  
  age: 12,  
  speak() {  
    console.log('Hello from '  
      + this.firstName);  
  }  
}  
  
module.exports = lisa;
```

main.js

```
const marge = require('./marge.js');  
const lisa = require('./lisa.js');  
  
marge.sayHello();  
lisa.speak();
```

require identifies and
imports objects defined
in other modules



Multiple Exports

export specific
objects

```
const marge = {  
  firstName: 'marge',  
  lastName: 'simpson',  
  age: 40,  
  sayHello() {  
    console.log('Hello from me!');  
  },  
};  
  
const homer = {  
  firstName: 'homer',  
  lastName: 'simpson',  
  age: 45,  
  sayHello() {  
    console.log('Hello from me!');  
  },  
};  
  
exports.marge = marge;  
exports.homer = homer;
```

simpsons.js

require identifies
specific object

```
const homer = require('./simpsons.js').homer;  
const marge = require('./simpsons.js').marge;  
  
homer.sayHello();  
marge.sayHello();
```

test.js

Multiple Exports

Alternative **exports**
syntax

```
exports.marge = {  
  firstName: 'marge',  
  lastName: 'simpson',  
  age: 40,  
  sayHello() {  
    console.log('Hello from me!');  
  },  
};  
  
exports.homer = {  
  firstName: 'homer',  
  lastName: 'simpson',  
  age: 45,  
  sayHello() {  
    console.log('Hello from me!');  
  },  
};
```

simpsons.js

require identifies
specific object

```
const homer = require('./simpsons.js').homer;  
const marge = require('./simpsons.js').marge;  
  
homer.sayHello();  
marge.sayHello();
```

test.js

Default Export

Single export - an array of objects

```
const Assets = require('./app/controllers/assets');
const Report = require('./app/controllers/report');
const Plot = require('./app/controllers/plot');

module.exports = [
  { method: 'GET', path: '/', config: Report.report },
  { method: 'GET', path: '/report', config: Report.report },
  { method: 'GET', path: '/clear', config: Report.clear },

  { method: 'GET', path: '/plot', config: Plot.plotview },
  { method: 'POST', path: '/plot', config: Plot.plot },
  {
    method: 'GET',
    path: '/{param*}',
    config: { auth: false },
    handler: Assets.servePublicDirectory,
  },
];
```

routes.js

Import single object (array)

```
const allRoutes = require('./routes')
```

test.js