理解JavaScript中的闭包

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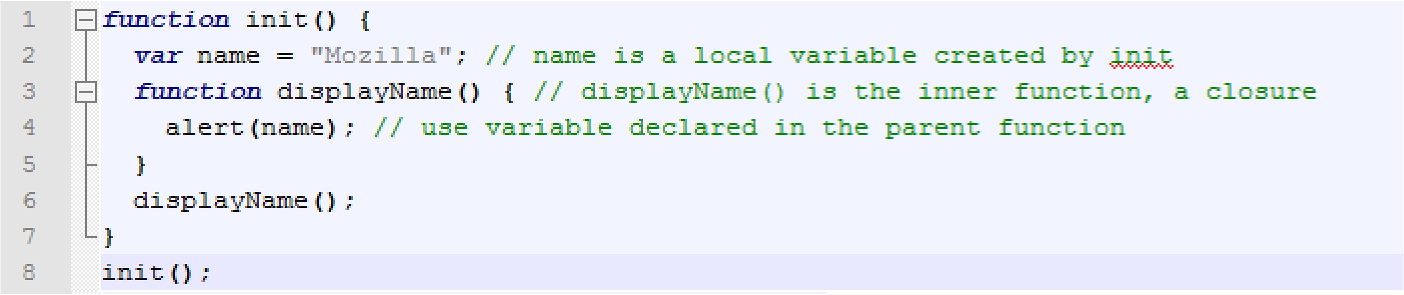
内容

- 变量的作用域
- 闭包的定义
- 闭包的例子
- 闭包的应用
- 性能考虑

变量的作用域

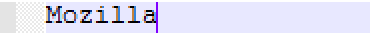
在JavaScript中，局部变量的作用域是由它定义的函数决定，嵌套函数可以访问它的外部作用域的变量。

代码： ex1



```
function init() {
  var name = "Mozilla"; // name is a local variable created by init
  function displayName() { // displayName() is the inner function, a closure
    alert(name); // use variable declared in the parent function
  }
  displayName();
}
init();
```

运行结果



```
Mozilla
```

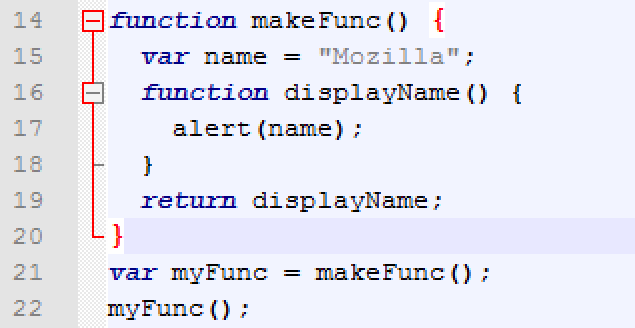
闭包的定义

Closures are functions that refer to independent (free) variables. In other words, the function defined in the closure 'remembers' the environment in which it was created.

-- From Mozilla Developer Network

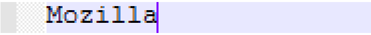
闭包是涉及独立变量的函数。换句话说，在闭包中定义的函数会记住它创建的环境。

代码： ex2



```
function makeFunc() {
  var name = "Mozilla";
  function displayName() {
    alert(name);
  }
  return displayName;
}
var myFunc = makeFunc();
myFunc();
```

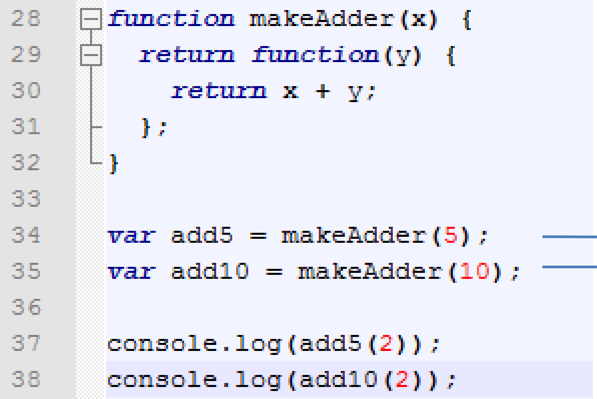
运行结果



```
Mozilla
```

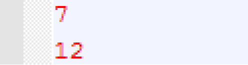
闭包的例子

代码： ex3

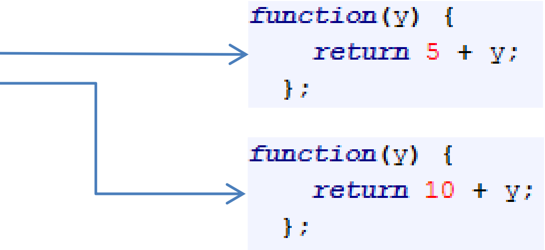


```
function makeAdder(x) {
  return function(y) {
    return x + y;
  };
}

var add5 = makeAdder(5);
var add10 = makeAdder(10);

console.log(add5(2));
console.log(add10(2));
```

运行结果



```
7
12
```



```
function(y) {
    return 5 + y;
  };
```

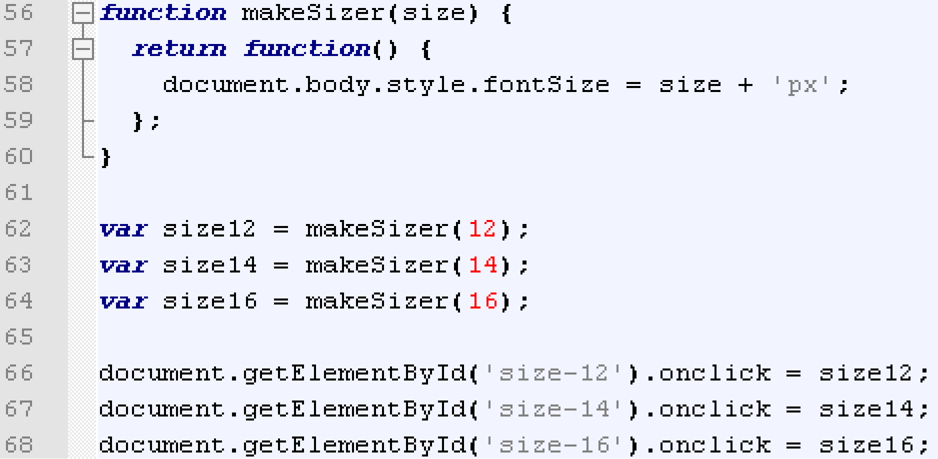
```
function(y) {
    return 10 + y;
  };
```

使用闭包

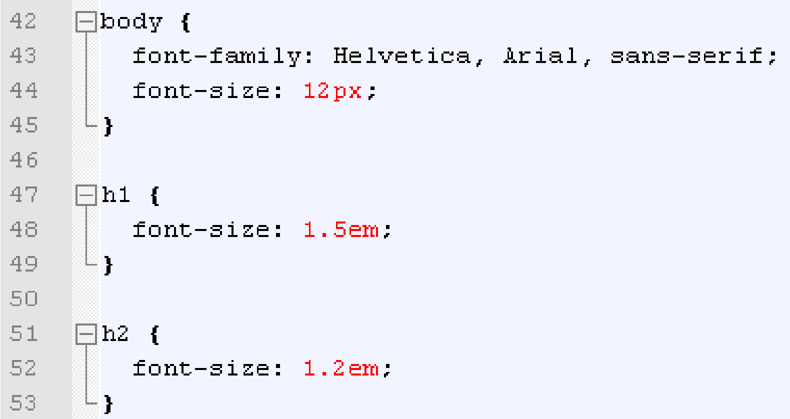
当希望某些对象只能被一个方法使用时，我们可以使用闭包。

代码： ex4

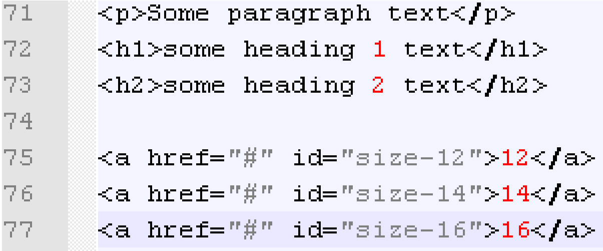
JavaScript



```
function makeSizer(size) {
  return function() {
    document.body.style.fontSize = size + 'px';
  };
}

var size12 = makeSizer(12);
var size14 = makeSizer(14);
var size16 = makeSizer(16);

document.getElementById('size-12').onclick = size12;
document.getElementById('size-14').onclick = size14;
document.getElementById('size-16').onclick = size16;
```



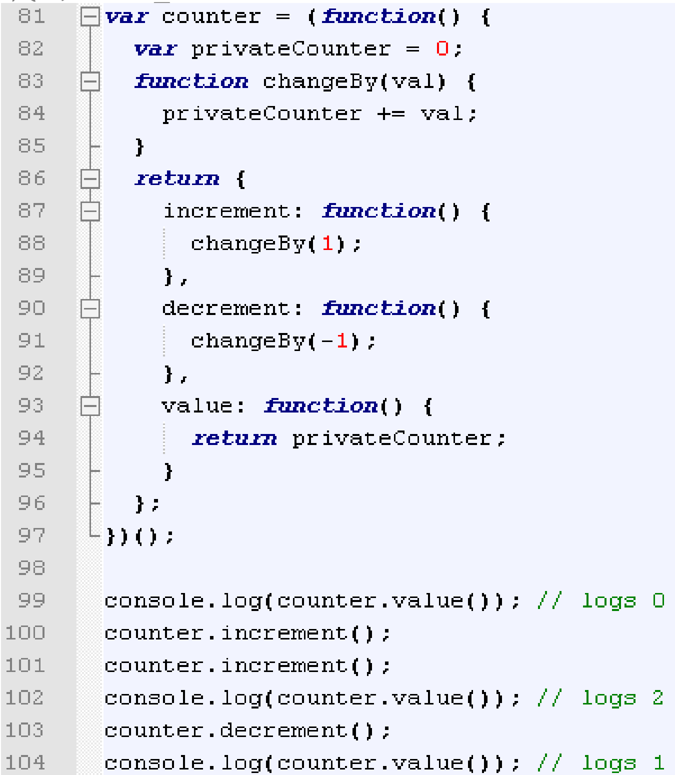
```
body {
   font-family: Helvetica, Arial, sans-serif;
   font-size: 12px;
}

h1 {
   font-size: 1.5em;
}

h2 {
   font-size: 1.2em;
}
```



```
<p>Some paragraph text</p>
<h1>some heading 1 text</h1>
<h2>some heading 2 text</h2>

<a href="#" id="size-12">12</a>
<a href="#" id="size-14">14</a>
<a href="#" id="size-16">16</a>
```

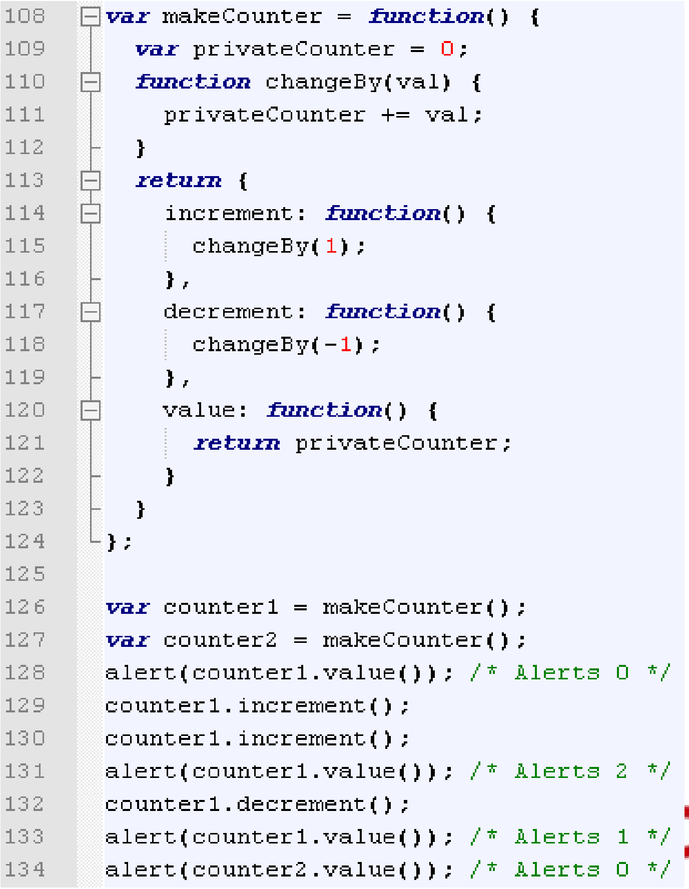
使用闭包 模拟私有方法

代码： ex5_1



```javascript
var counter = (function() {
  var privateCounter = 0;
  function changeBy(val) {
    privateCounter += val;
  }
  return {
    increment: function() {
      changeBy(1);
    },
    decrement: function() {
      changeBy(-1);
    },
    value: function() {
      return privateCounter;
    }
  };
})();

console.log(counter.value()); // logs 0
counter.increment();
counter.increment();
console.log(counter.value()); // logs 2
counter.decrement();
console.log(counter.value()); // logs 1
```

代码： ex5_2



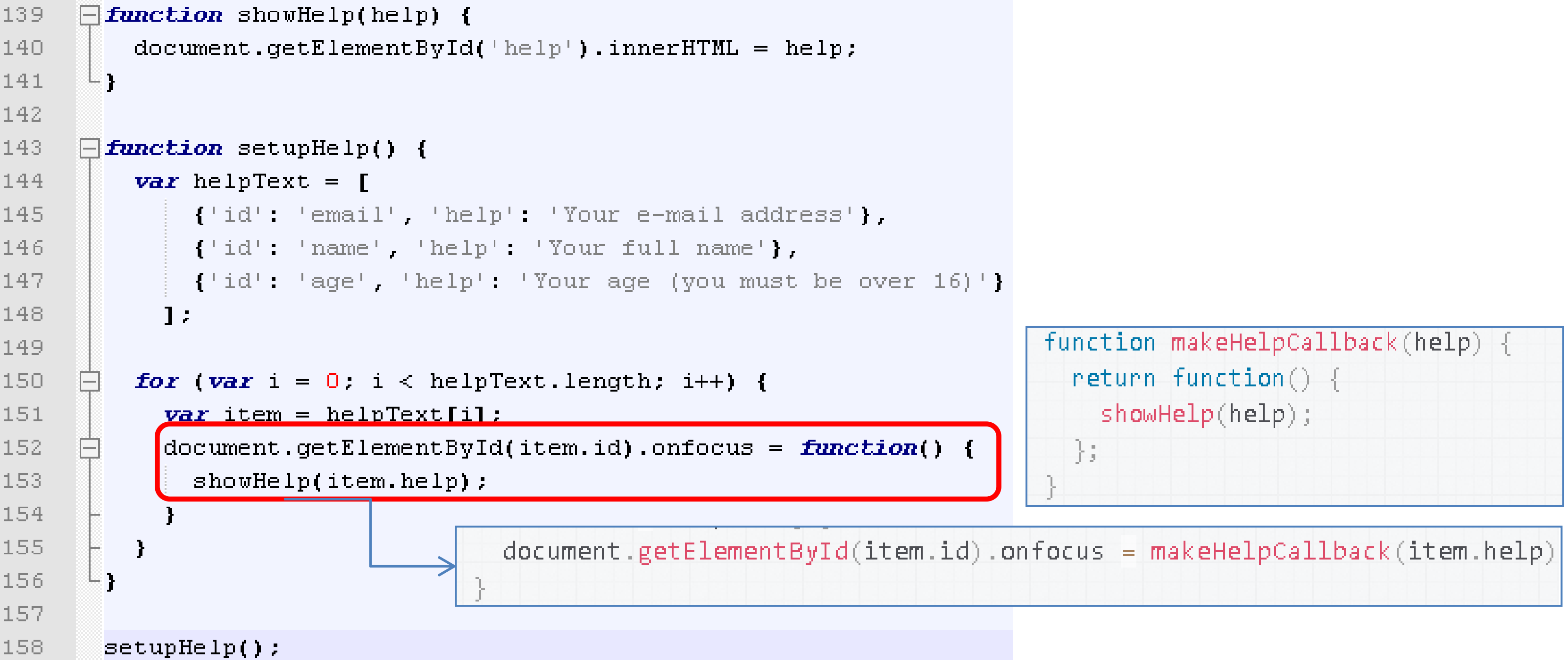
```javascript
var makeCounter = function() {
  var privateCounter = 0;
  function changeBy(val) {
    privateCounter += val;
  }
  return {
    increment: function() {
      changeBy(1);
    },
    decrement: function() {
      changeBy(-1);
    },
    value: function() {
      return privateCounter;
    }
  }
};

var counter1 = makeCounter();
var counter2 = makeCounter();
alert(counter1.value()); /* Alerts 0 */
counter1.increment();
counter1.increment();
alert(counter1.value()); /* Alerts 2 */
counter1.decrement();
alert(counter1.value()); /* Alerts 1 */
alert(counter2.value()); /* Alerts 0 */
```

使用闭包

常见错误：在循环中创建闭包

代码： ex6

JavaScript

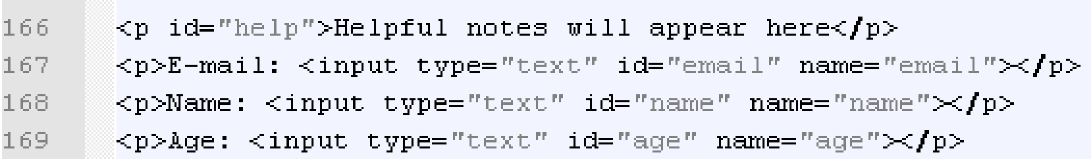


```javascript
function showHelp(help) {
  document.getElementById('help').innerHTML = help;
}

function setupHelp() {
  var helpText = [
      {'id': 'email', 'help': 'Your e-mail address'},
      {'id': 'name', 'help': 'Your full name'},
      {'id': 'age', 'help': 'Your age (you must be over 16)'}
    ];

  for (var i = 0; i < helpText.length; i++) {
    var item = helpText[i];
    document.getElementById(item.id).onfocus = function() {
      showHelp(item.help);
    }
  }
}

setupHelp();
```

```javascript
function makeHelpCallback(help) {
  return function() {
    showHelp(help);
  };
}
```

```javascript
  document.getElementById(item.id).onfocus = makeHelpCallback(item.help)
}
```

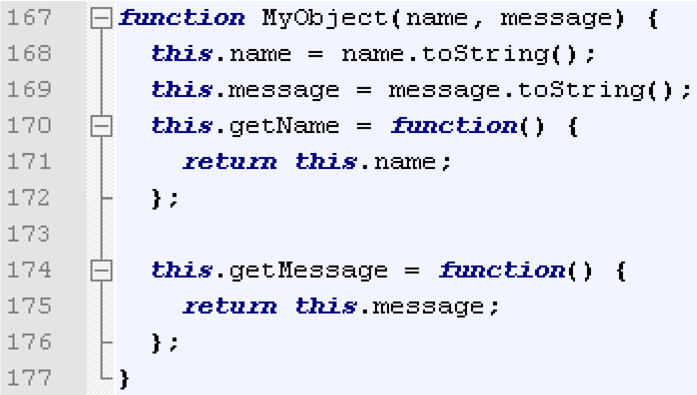
HTML



```html
<p id="help">Helpful notes will appear here</p>
<p>E-mail: <input type="text" id="email" name="email"></p>
<p>Name: <input type="text" id="name" name="name"></p>
<p>Age: <input type="text" id="age" name="age"></p>
```

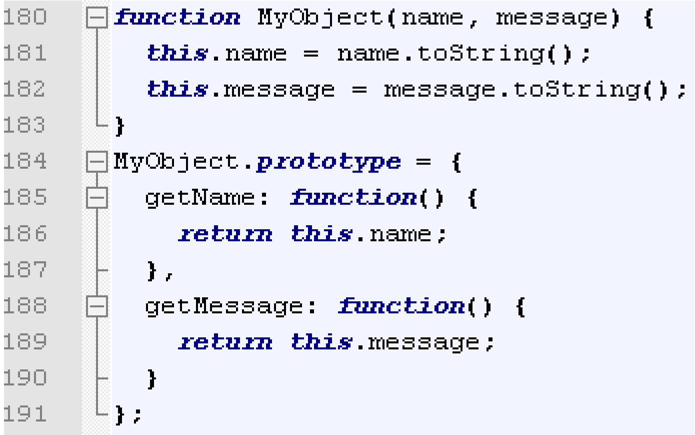
性能考虑

代码：ex7_1



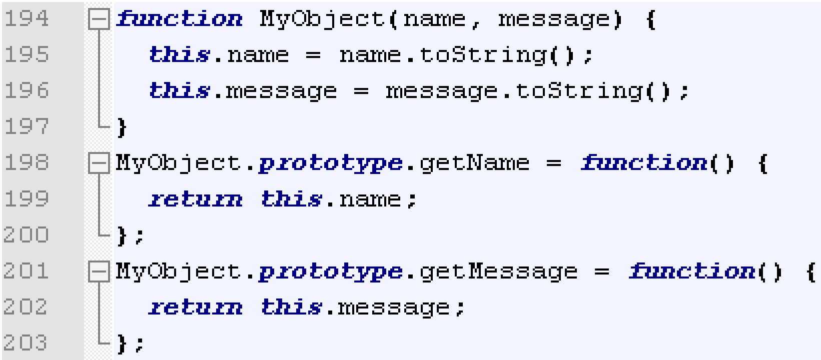
```
function MyObject(name, message) {
  this.name = name.toString();
  this.message = message.toString();
  this.getName = function() {
    return this.name;
  };

  this.getMessage = function() {
    return this.message;
  };
}
```

ex7_2



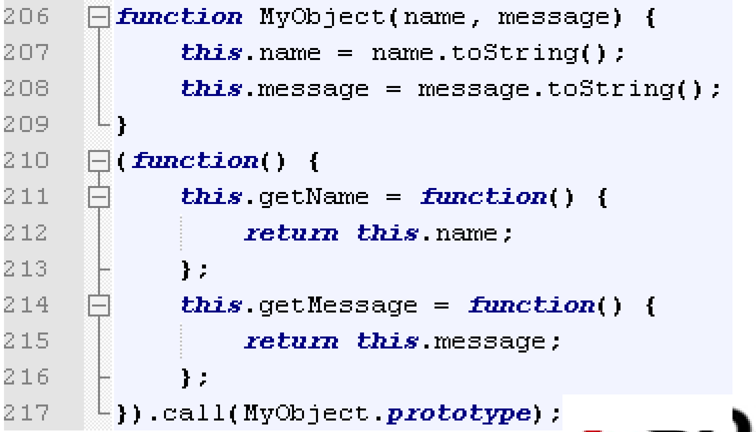
```
function MyObject(name, message) {
  this.name = name.toString();
  this.message = message.toString();
}
MyObject.prototype = {
  getName: function() {
    return this.name;
  },
  getMessage: function() {
    return this.message;
  }
};
```

ex7_3



```
function MyObject(name, message) {
  this.name = name.toString();
  this.message = message.toString();
}
MyObject.prototype.getName = function() {
  return this.name;
};
MyObject.prototype.getMessage = function() {
  return this.message;
};
```

ex7_4



```
function MyObject(name, message) {
    this.name = name.toString();
    this.message = message.toString();
}
(function() {
    this.getName = function() {
      return this.name;
    };
    this.getMessage = function() {
      return this.message;
    };
}).call(MyObject.prototype);
```

相关资料

参考资料	https://developer.mozilla.org/en-US/docs/Web/JavaScript/Closures
幻灯片	http://delphi.zijinshi.org/downloads/courses/1/Understanding_Closures_in_JavaScript.pdf
源代码	http://delphi.zijinshi.org/downloads/courses/1/code.txt

CSDN学院

THANKS

本课程由 Frank Zhang 提供

http://delphi.zijinshi.org

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