# software studio

# prototypes

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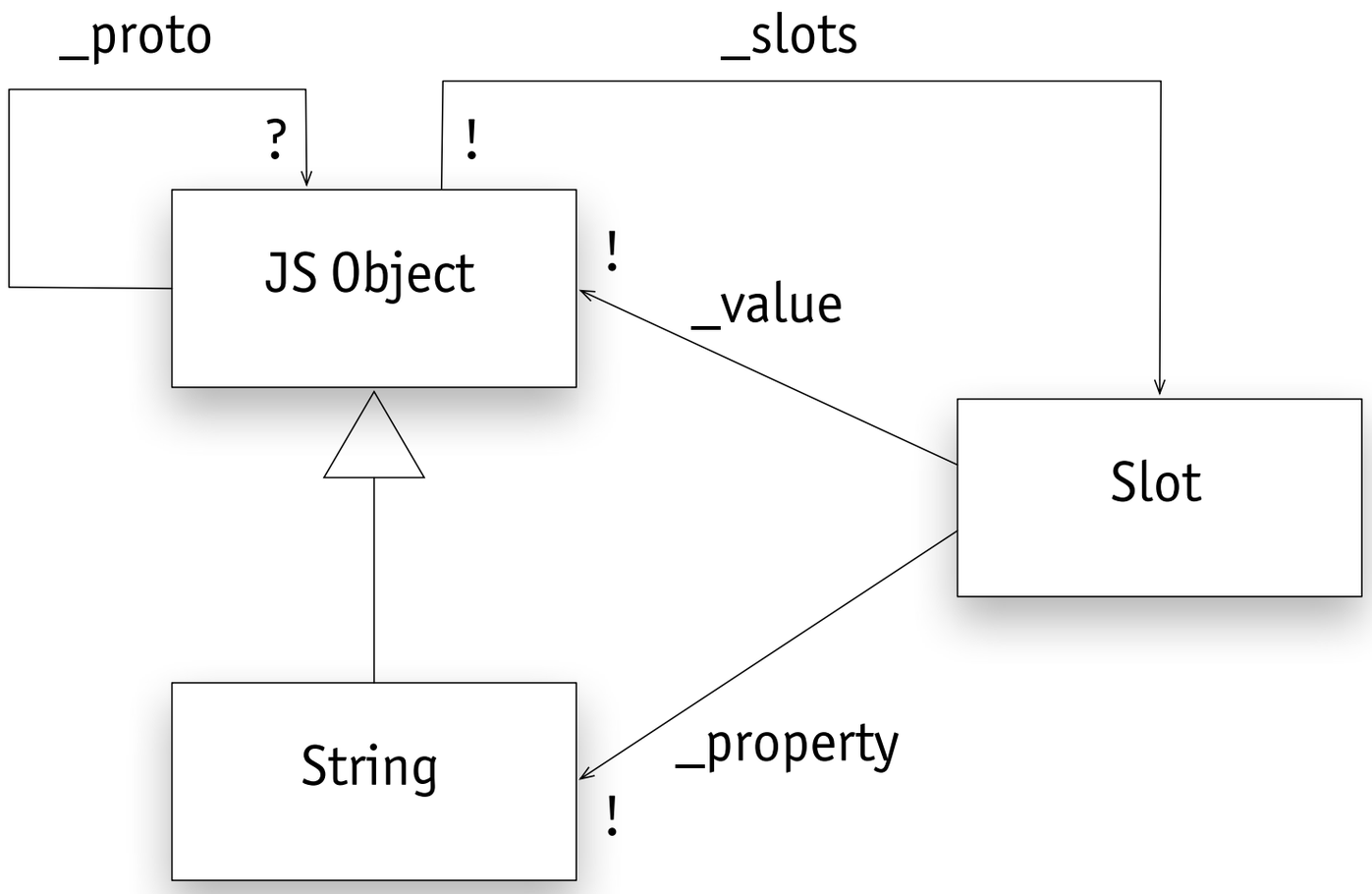
# object with prototype

```
> yellow = {red: 255, green: 255, blue: 0};
Object
 1.blue: 0
 2.green: 255
 3.red: 255
 4.__proto__: Object
    ...
    1.hasOwnProperty: function hasOwnProperty() { [native
      code] }
    ...
    2.toString: function toString() { [native code] }
    3.valueOf: function valueOf() { [native code] }
> yellow.hasOwnProperty("red")
true
> yellow.hasOwnProperty("reddish")
false
```

# object model for prototypes

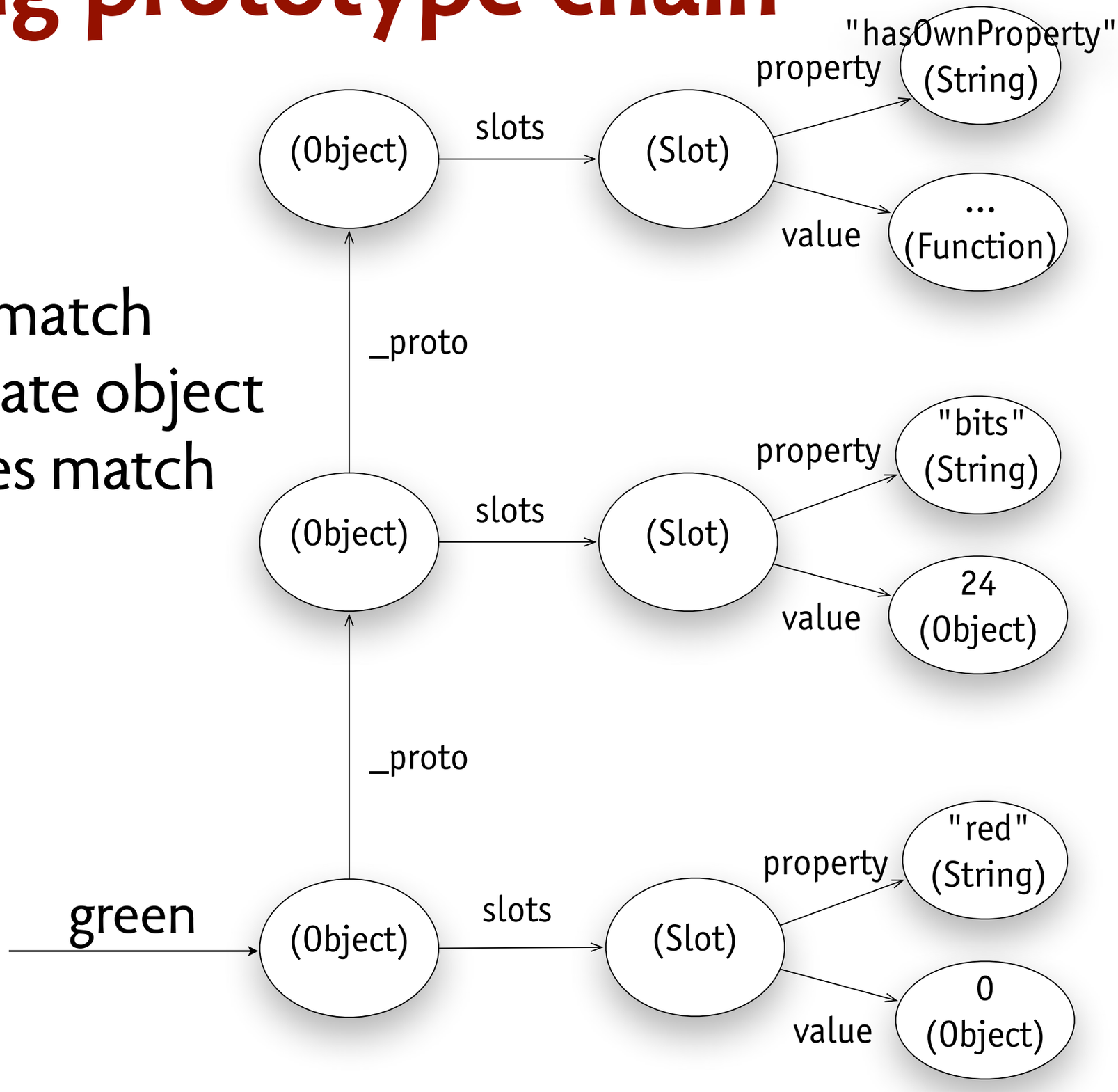



› _proto is not directly accessible!

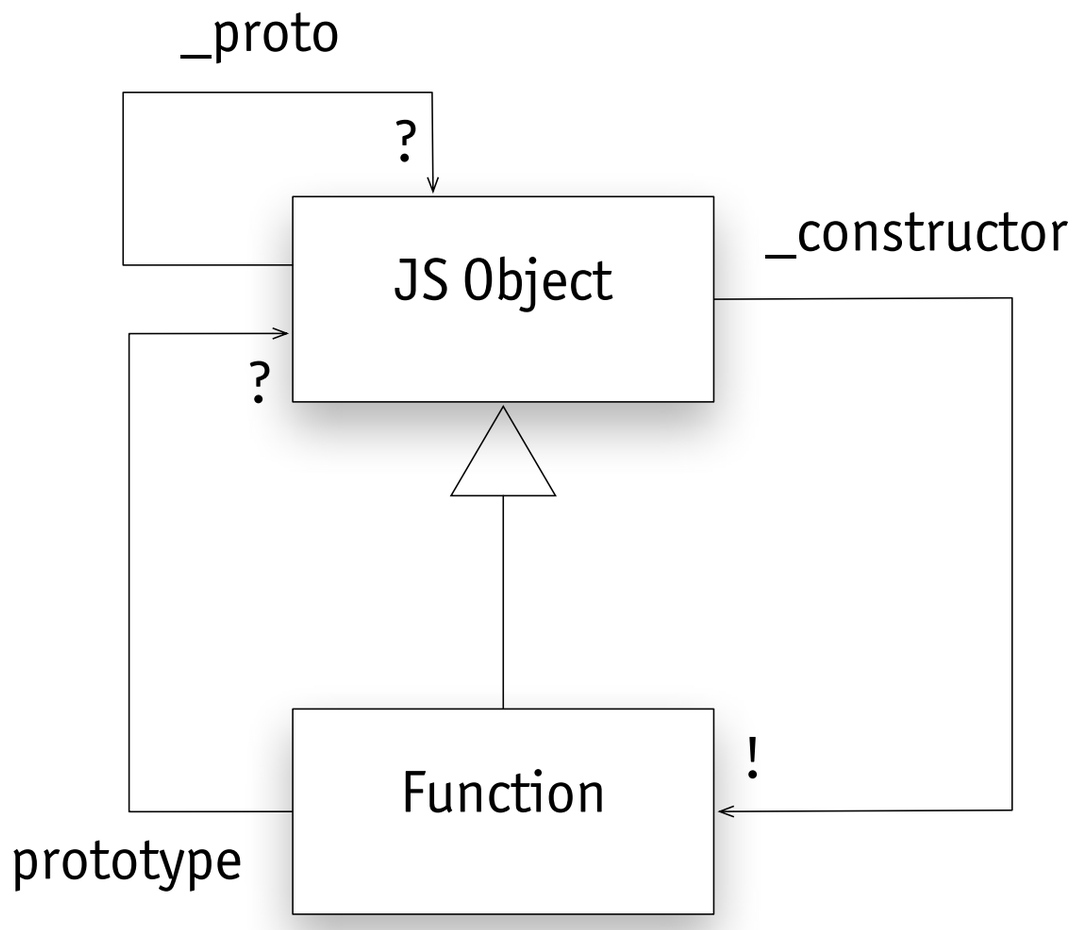
# get/set along prototype chain

- *get*: up chain until match
- *set*: always immediate object
- shadowing if names match

```
> green.red
0
> green.bits
24
```



# how to attach a prototype




› set prototype property of constructor (or modify it)
› calls to constructor then yield object with that prototype

# setting the prototype

```
var Color = function (r, g, b) {
  this.red = r; this.green = g; this.blue = b;
  }
Color.prototype = {bits: 24};
green = new Color(0, 255, 0);
```

```
> green.red
0
> green.bits
24
```

# modifying the prototype

```
var Color = function (r, g, b) {
  this.red = r; this.green = g; this.blue = b;
  }
Color.prototype.toCSS = function () {
    return "rgb(" + this.red + "," + this.green
        + "," + this.blue + ")";
  }
green = new Color(0, 255, 0);
document.body.style.backgroundColor = green.toCSS();
```

- how is this bound in call to method?
- it's dynamic: inside m in call e.m(), bound to value of e

# modifying vs setting prototype

## how do these differ?

```
Color.prototype.bits = 24;
Color.prototype = {bits: 24};
```

just need to track sharing between object and constructor; watch this:

```
> var Color = function (r, g, b) {
  this.red = r; this.green = g; this.blue = b;
  }
undefined
> red = new Color (255, 0, 0)
Color
> Color.prototype = {bits: 24}
Object
> green = new Color (0, 255, 0)
Color
> Color.prototype.space = "RGB"
"RGB"
> red.bits
undefined
> green.bits
24
> red.space
undefined
> green.space
"RGB"
```

# extending built-ins

```
Array.prototype.map = function (f) {
    var result = [];
    this.each (function (e) {
        result.push(f(e));
    });
    return result;
}
```

```
> [1,2,3].map(function (x) {return x * x;});
[1, 4, 9]
```

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Spring 2013