

Arrays and Reference Types



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Overview

Reference Types
Explained

Reference Type
Examples

Arrays

Dates

Regular
Expressions

Understanding Reference Types

Primitive Type Storage

```
var n = 42;
```

n:

42

```
var s = "forty-two";
```

s:

forty-two

```
var b = true;
```

b:

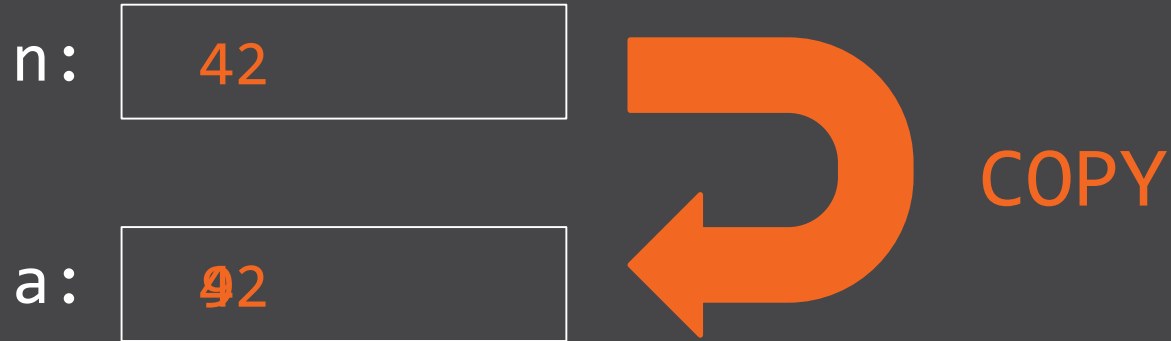
true

Primitive Type Storage

```
var n = 42;
```

```
var a = n;
```

```
a = 9;
```

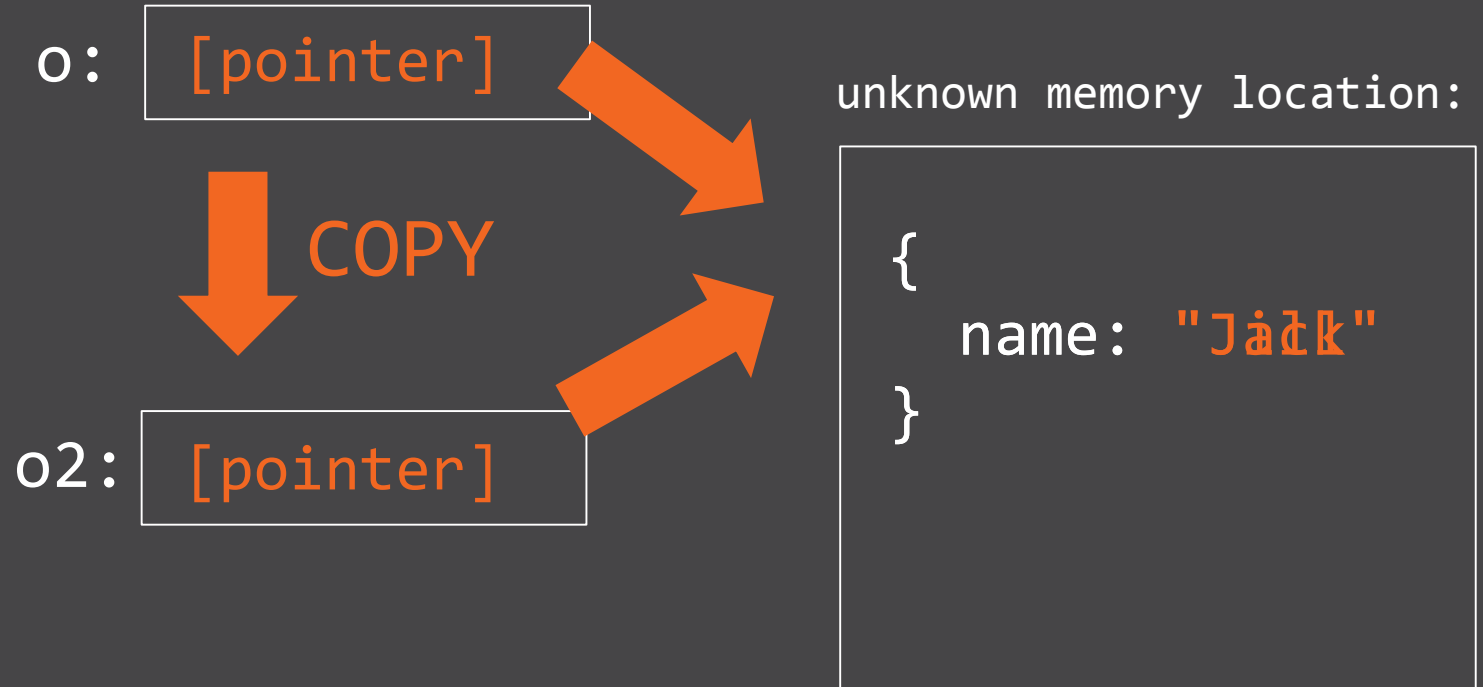


Reference Type Storage

```
var o = {  
  name: "Jill"  
};
```

```
var o2 = o;
```

```
o2.name = "Jack";
```



Common Reference Types

Objects

Arrays

Dates

RegExp's

Functions

Primitives
(via Wrappers)

Reference Type Examples

```
var blog = {  
  name: 'Ski Utah'  
};  
var updatedBlog = blog;  
console.log(updatedBlog.name);
```

Question

What shows in the console?

Answer

Ski Utah

```
var blog = {  
  name: 'Ski Utah'  
};  
var updatedBlog = blog;  
blog.name = 'Rocky Mountain Skiing';  
console.log(updatedBlog.name);
```

Question

What shows in the console?

Answer

Rocky Mountain Skiing

```
var blog = {  
  name: 'Ski Utah'  
};  
var updatedBlog = blog;  
updatedBlog.name = 'Rocky Mountain Skiing';  
console.log(blog.name);
```

Question

What shows in the console?

Answer

Rocky Mountain Skiing

```
var blog = {  
  name: 'Ski Utah'  
};  
function changeBlogName(localBlog) {  
  localBlog.name = 'no name';  
}  
changeBlogName(blog);  
console.log(blog.name);
```

Question

What shows in the console?

Answer

no name

```
var a1 = [1, 2, 3];  
var a2 = a1;  
a1[0] = 99;  
console.log(a2[0]);
```

Question

What shows in the console?

Answer

99

Array Fundamentals

```
var entries = new Array('Trains', 'Plains',  
    'Automobiles');  
console.log(entries instanceof Array);
```

Question

What shows in the console?

Answer

true

```
var entries = new Array('Trains', 42, true);  
console.log(entries instanceof Array);
```

Question

What shows in the console?

Answer

true


```
var entries = Array('Trains', 'Plains',  
    'Automobiles');  
console.log(entries instanceof Array);
```

Question

What shows in the console?

Answer

true

```
var entries = ['Trains', 'Plains',  
              'Automobiles'];  
console.log(entries instanceof Array);
```

Question

What shows in the console?

Answer

true

```
var entries = ['Trains', 'Plains',  
              'Automobiles'];  
console.log(entries[0]);
```

Question

What shows in the console?

Answer

Trains

```
var entries = ['Trains', 'Plains',  
              'Automobiles'];  
console.log(entries[2]);
```

Question

What shows in the console?

Answer

Automobiles

```
var entries = ['Trains', 'Plains',  
              'Automobiles'];  
console.log(entries[3]);
```

Question

What shows in the console?

Answer

undefined

```
var entries = new Array(5);  
console.log(entries.length);
```

Question

What shows in the console?

Answer

5

```
var entries = new Array("5");  
console.log(entries.length);
```

Question

What shows in the console?

Answer

1

```
var entries = [];  
console.log(entries.length);
```

Question

What shows in the console?

Answer

0


```
var entries = [,,,];  
console.log(entries.length);
```

Question

What shows in the console?

Answer

3 (or 4 in IE 8 and lower)

```
var entries = ['Planes', 'Trains'];  
entries.length = 10;  
console.log(entries.length);
```

Question

What shows in the console?

Answer

10

```
var entries = ['Planes', 'Trains'];  
entries.length = 1;  
console.log(entries[1]);
```

Question

What shows in the console?

Answer

undefined

```
var entries = ['Planes', 'Trains',  
              'Automobiles'];  
entries[2] = 'Cars';  
console.log(entries[2]);
```

Question

What shows in the console?

Answer

Cars

```
var entries = ['Planes', 'Trains',  
              'Automobiles'];  
entries[42] = 'Cars';  
console.log(entries[42]);
```

Question

What shows in the console?

Answer

Cars

```
var entries = ['Planes', 'Trains',  
              'Automobiles'];  
entries[42] = 'Cars';  
console.log(entries[42]);  
console.log(entries.length);
```

Question

What shows in the console?

Answer

Cars

43

```
var entries = ['Planes', 'Trains',  
              'Automobiles'];  
entries[entries.length] = 'Bicycles';  
console.log(entries.length);
```

Question

What shows in the console?

Answer

4

```
var entries = ['Planes', 'Trains',  
              'Automobiles'];  
console.log(entries.toString());
```

Question

What shows in the console?

Answer

Planes,Trains,Automobiles


```
var ratings = [5, 2, 4];  
console.log(ratings.valueOf());
```

Question

What shows in the console?

Answer

[5, 2, 4]

```
var ratings = [5, 2, 4];  
console.log(ratings.join('|'));
```

Question

What shows in the console?

Answer

5|2|4

Array Features

```
var ratings = [];  
ratings.push(5);  
ratings.push(2, 4);  
console.log(ratings.length);
```

Question

What shows in the console?

Answer

3

```
var ratings = [];  
ratings.push(5);  
ratings.push(2, 4);  
console.log(ratings.pop());
```

Question

What shows in the console?

Answer

4

```
var ratings = [];  
ratings.push(5);  
ratings.push(2, 4);  
ratings.pop();  
console.log(ratings.length);
```

Question

What shows in the console?

Answer

2

```
var ratings = [];  
ratings.push(5);  
ratings.push(2, 4);  
var firstRating = ratings.shift();  
console.log(firstRating);
```

Question

What shows in the console?

Answer

5

```
var ratings = [];  
ratings.push(5);  
ratings.push(2, 4);  
var firstRating = ratings.shift();  
console.log(ratings.length);
```

Question

What shows in the console?

Answer

2


```
var ratings = [];  
ratings.push(5);  
ratings.push(2, 4);  
var newCount = ratings.unshift(3);  
console.log(ratings[0]);  
console.log(newCount);
```

Question

What shows in the console?

Answer

3

4

```
var ratings = [1, 2, 3];  
var newRatings = ratings.concat([4, 5, 6]);  
console.log(newRatings.length);
```

Question

What shows in the console?

Answer

6

```
var ratings = [1, 2, 3];  
var newRatings = ratings.concat([4, 5, 6], 7, 8);  
console.log(newRatings.length);
```

Question

What shows in the console?

Answer

8

```
var ratings = [1, 2, 3];  
var newRatings = ratings.concat([4, 5, 6], 7, 8);  
console.log(ratings.length);
```

Question

What shows in the console?

Answer

3

```
var ratings = [1, 2, 3, 4];  
var newRatings = ratings.slice(2);  
console.log(newRatings.toString());
```

Question

What shows in the console?

Answer

3,4

```
var ratings = [1, 2, 3, 4];  
var newRatings = ratings.slice(1,3);  
console.log(newRatings.toString());
```

Question

What shows in the console?

Answer

2,3

```
var ratings = [1, 2, 3, 4];  
var newRatings = ratings.slice(1,3);  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,3,4

```
var ratings = [1, 2, 3, 4];  
var newRatings = ratings.slice(-2);  
console.log(newRatings.toString());
```

Question

What shows in the console?

Answer

3,4


```
var ratings = [1, 2, 3, 4];  
ratings.splice(1, 2);  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,4

```
var ratings = [1, 2, 3, 4];  
var removedRating = ratings.splice(0, 1);  
console.log(removedRating.toString());
```

Question

What shows in the console?

Answer

1

```
var ratings = [1, 2, 3, 4];  
ratings.splice(2, 0, 99);  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,99,3,4

```
var ratings = [1, 2, 3, 4];  
ratings.splice(2, 0, 99, 100, 101);  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,99,100,101,3,4

```
var ratings = [1, 2, 3, 4];  
ratings.splice(2, 1, 99);  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,99,4

```
var ratings = [1, 2, 3, 4];  
ratings.splice(2, 1, 99, 100, 101);  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,99,100,101,4

```
var ratings = [1, 2, 3, 4];  
ratings.reverse();  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

4,3,2,1

```
var ratings = [4, 1, 3, 2];  
ratings.sort();  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,3,4


```
var ratings = [4, 1, 3, 2, 10];  
ratings.sort();  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,10,2,3,4

```
var ratings = [4, 1, 3, 2, 10];  
ratings.sort(function (value1, value2) {  
    return value1 - value2;  
});  
console.log(ratings.toString());
```

Question

What shows in the console?

Answer

1,2,3,4,10

```
var ratings = [1, 2, 3, 4, 5, 4, 3, 2, 1];  
console.log(ratings.indexOf(3));
```

Question

What shows in the console?

Answer

2

```
var ratings = [1, 2, 3, 4, 5, 4, 3, 2, 1];  
console.log(ratings.indexOf('3'));
```

Question

What shows in the console?

Answer

-1

```
var ratings = [1, 2, 3, 4, 5, 4, 3, 2, 1];  
console.log(ratings.indexOf(66));
```

Question

What shows in the console?

Answer

-1

```
var ratings = [1, 2, 3, 4, 5, 4, 3, 2, 1];  
console.log(ratings.lastIndexOf(1));
```

Question

What shows in the console?

Answer

8

Date Fundamentals

```
var dt = new Date();  
console.log(dt);
```

Question

What shows in the console?

Answer

```
Fri Sep 25 2015 11:20:1  
1 GMT-  
0700 (Pacific Daylight  
Time)
```



```
var dt = new Date(0);  
console.log(dt);
```

Question

What shows in the console?

Answer

```
Wed Dec 31 1969 16:00:00  
GMT-  
0800 (Pacific Standard  
Time)
```

```
var dt = new Date('2/13/2015');  
console.log(dt);
```

Question

What shows in the console?

Answer

```
Fri Feb 13 2015 00:00:00  
GMT-  
0800 (Pacific Standard  
Time)
```

```
var dt = new Date('March 1, 2015');  
console.log(dt);
```

Question

What shows in the console?

Answer

```
Sun Mar 01 2015 00:00:00  
GMT-  
0800 (Pacific Standard  
Time)
```

```
var dt = new Date('Hi Mom!');  
console.log(dt);
```

Question

What shows in the console?

Answer

Invalid Date

```
var dt = Date.parse('Hi Mom!');  
console.log(dt);
```

Question

What shows in the console?

Answer

NaN

```
var dt = Date.UTC(2000, 0);  
console.log(dt);
```

Question

What shows in the console?

Answer

946684800000

```
var dt = new Date(Date.UTC(2000, 0));  
console.log(dt);
```

Question

What shows in the console?

Answer

```
Fri Dec 31 1999 16:00:00  
GMT-  
0800 (Pacific Standard  
Time)
```

```
var dt = Date.now();  
console.log(dt);
```

Question

What shows in the console?

Answer

1443206120689


```
var dt = new Date();  
console.log(dt.toDateString());
```

Question

What shows in the console?

Answer

Fri Sep 25 2015

```
var dt = new Date();  
console.log(dt.toString());
```

Question

What shows in the console?

Answer

11:38:13 GMT-
0700 (Pacific Daylight
Time)

```
var dt = new Date();  
console.log(dt.getFullYear());
```

Question

What shows in the console?

Answer

2015

```
var dt = new Date();  
dt.setFullYear(2025);  
console.log(dt.getFullYear());
```

Question

What shows in the console?

Answer

2025

add website page for date/time fns

Question

Answer

Regular Expressions

```
var blogText = "Sam I Am";  
var pattern = new RegExp('am', 'g');  
console.log(pattern instanceof RegExp);
```

Question

What shows in the console?

Answer

true

```
var blogText = "Sam I Am";  
var pattern = /am/g;  
console.log(pattern instanceof RegExp);
```

Question

What shows in the console?

Answer

true


```
var blogText = "Sam I Am";  
var pattern = /am/g;  
console.log(pattern.test(blogText));
```

Question

What shows in the console?

Answer

true

```
var blogText = "Sam I Am";  
var pattern = /bam/g;  
console.log(pattern.test(blogText));
```

Question

What shows in the console?

Answer

false

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
console.log(pattern.test(blogText));  
console.log(pattern.test(blogText));  
console.log(pattern.test(blogText));
```

Question

What shows in the console?

Answer

true

true

false

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = pattern.exec(blogText);  
console.log(result);
```

Question

What shows in the console?

Answer

```
["m", index: 2, input:  
"Sam I Am"]
```

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = pattern.exec(blogText);  
console.log(result[0]);
```

Question

What shows in the console?

Answer

m

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = pattern.exec(blogText);  
console.log(result.index);
```

Question

What shows in the console?

Answer

2

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = pattern.exec(blogText);  
console.log(result.input);
```

Question

What shows in the console?

Answer

Sam I Am

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = pattern.exec(blogText);  
console.log(result.index);  
result = pattern.exec(blogText);  
console.log(result.index);
```

Question

What shows in the console?

Answer

2

7


```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = pattern.exec(blogText);  
while (result) {  
    console.log(result.index);  
    result = pattern.exec(blogText);  
}
```

Question

What shows in the console?

Answer

2

7

```
var blogText = "Sam I Am";  
var pattern = /m/g;  
var result = blogText.match(pattern);  
console.log(result);
```

Question

What shows in the console?

Answer

["m", "m"]

```
var blogText = "Sam I Am";  
var pattern = /am/g;  
var result = blogText.match(pattern);  
console.log(result);
```

Question

What shows in the console?

Answer

["am"]

```
var blogText = "Sam I Am";  
var pattern = /am/gi;  
var result = blogText.match(pattern);  
console.log(result);
```

Question

What shows in the console?

Answer

["am", "Am"]

```
var blogText = "Sam I Am";  
var pattern = /[aA]m/g;  
var result = blogText.match(pattern);  
console.log(result);
```

Question

What shows in the console?

Answer

["am", "Am"]

```
var blogText = "Sam I Am";  
var pattern = /.m/g;  
var result = blogText.match(pattern);  
console.log(result);
```

Question

What shows in the console?

Answer

["am", "Am"]

Summary



- Reference Types Explained
- Reference Type Examples
- Arrays
- Dates
- Regular Expressions