

Introduction to Arrays

- ❖ Grouping of similarly named variables, which are grouped sequentially in memory and accessed by their element (*index*) number
- ❖ Element numbering begins with 0 to one less than the total number of elements
- ❖ An Array element can hold numbers, strings, Boolean (true/false), and Objects

| | |
|------------|-----|
| Counter[0] | 30 |
| Counter[1] | 45 |
| Counter[2] | 53 |
| Counter[3] | 2 |
| Counter[4] | 879 |

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Declaring Arrays

- ❖ Declaration:

| | |
|------------|-----|
| Counter[0] | 30 |
| Counter[1] | 45 |
| Counter[2] | 53 |
| Counter[3] | 2 |
| Counter[4] | 879 |

 - ◆ `var Counter = new Array(5);`
 - ◆ Reserves Counter array memory
 - Counter[0] to Counter[4]
 - ◆ No values are stored in elements
 - ◆ May store assign values to elements individually
 - Counter[0] = 30;
 - Counter[1] = 45;
 - ...
 - ◆ `var Counter = new Array(30, 45, 53, 2, 879);`
 - ◆ Reserves Counter array memory
 - Counter[0] to Counter[4] and initialized the first 5 elements to the the values shown

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for Loop Array Initialization

- ❖ A for loop can be used to initialize a declared array
- ❖ Set all array elements to 0
 - `var Counter = new Array(5);`
 - `for(var K=0; K< 5 ; K++)`
 - `Counter[K] = 0;`
- ❖ This is very useful for large arrays such as:
 - `var Score= new Array(100);`
 - `for(var K=0; K< 100 ; K++)`
 - `Score[K] = 0;`

| | |
|------------|---|
| Counter[0] | 0 |
| Counter[1] | 0 |
| Counter[2] | 0 |
| Counter[3] | 0 |
| Counter[4] | 0 |

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Array Bounds Checking

- ❖ For JavaScript the array element quatity is optional. The following is acceptable syntax.
 - `var Counter = new Array();`
- ❖ Elements can be added to an existing Array by assigning values to new array elements. The number of elements is increased to eight.
 - `var Counter = new Array(5);`
 - `for(var K = 0; K < 8; K++)`
 - `Counter[K] = 0;`
- ❖ The array length property specifies the total number of elements contained in an array.
 - `for(var K=0; K< Counter.length; K++)`
 - `Counter[K] = 0;`

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Counter Controlled Array Processing

- ❖ Find the Maximum score element of an array of 5 scores? Score 1 = 68

```
var Score = new Array(5);
for(var i = 0; i < Score.length; i++)
    Score[i] = parseFloat(
        window.prompt("Enter Score", "0"));
for(var j = 0, Max = 0; j < Score.length; j++)
{
    document.writeln("Score " + (j+1) + " = "
        + Score[j] + "<br \> ");
    if(Score[j] > Max) Max = Score[j];
}
document.writeln("Maximum Score = " + Max);
```

Score 1 = 68
Score 2 = 87
Score 3 = 96
Score 4 = 87
Score 5 = 93
Maximum Score = 96

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Sentinal Controlled Array Processing

```
var Entry, Score = new Array();
for(var i = 0; true; i++)
{
    Entry = parseFloat(
        window.prompt("Enter Score (-1 to quit)","0"));
    if(Entry < 0) break;
    Score[i] = Entry;
}
for(var j = 0, Max = 0; j < Score.length; j++)
{
    document.writeln("Score " + (j+1) + " = "
        + Score[j] + "<br \>");
    if(Score[j] > Max) Max = Score[j];
}
document.writeln("Maximum Score = " + Max);
```

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Passing Array to Function

- ❖ **Pass-by-value** is used to pass the value of an argument in a function call to the function parameter.

- ◆ Number, string, and Boolean values
- ◆ Individual Array Elements

- ❖ **Pass-by-reference is used to pass entire array to a function**

- ◆ Pass the memory location where array is stored not the values
- ◆ Modifications to the array in function affect the array values in entire program

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```
<head> <title>Card Suits</title>
<script type="text/javascript">
var Suit = new Array("&spades;","&clubs;","&hearts;","&diamonds;");
var Rank = new Array("A","2","3","4","5","6","7","8","9","10","J","Q","K");
document.writeln("<h3>Your hand is:<br />");
DealHand(Suit, Rank);
document.writeln("<br />Opponent hand is:<br />");
DealHand(Suit, Rank);
document.writeln("<br />Good Luck</h3>");
</script>
</head>
```

```
function DealHand(A, B) {  
  for(var i=1; i <=5; i++)  
    DealCard(A, B);  
  document.writeln("<br />");  
}
```

```
function DealCard(S,R) {  
    var i,j;  
    i = Math.floor(Math.random() * S.length);  
    j = Math.floor(Math.random() * R.length);  
    document.writeln("        " + R[j] + S[i]);  
}
```

```
</script> </head> <body> </body>
```

Your hand is:

4♠ 8♦ 4♦ A♦ J♥

Opponent hand is:

K♥ 3♦ 9♥ 5♣ 3♣

Good Luck

Your hand is:

A♣ 5♥ 8♦ A♣ 3♠

Opponent hand is:

3♦ A♣ 4♦ J♥ 5♦

Good Luck