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JavaScript Quick Sort Array Proto Type Method



Cy Scott, 18 Jul 2014 [CPOL](#)

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Introduction

This is a proto type method for arrays in JavaScript. It utilizes an iterative version of the Quick Sort algorithm. More information about the quick sort algorithm can be found [here](#).

Background

I adapted an iterative version of Quick Sort made in C located [here](#). I tested this iterative version and a recursive version and found that the iterative version usually preforms about twice as fast. I also included some additional features that are not included in the vanilla version of JavaScript sort.

JavaScript Quick Sort Library

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```
(function()
{
    var
    defaultCompare,
    defaultSwap,
    partition,
    quickSort;

    Array.prototype.quickSort = function(compare, swap)
    {
        if (typeof compare !== "function")
        {
            compare = defaultCompare;
        }
        if (typeof swap !== "function")
```

```

    {
        swap = defaultSwap;
    }
    quickSort(this, 0, this.length - 1, compare, swap);
};
defaultCompare = function(value1, value2)
{
    return value1 < value2;
};
defaultSwap = function(array, index1, index2)
{
    var temp = array[index1];
    array[index1] = array[index2];
    array[index2] = temp;
};
partition = function(array, start, stop, compare, swap)
{
    var pivot = array[stop], storeIndex = start - 1;

    while (start < stop)
    {
        if (compare(array[start], pivot))
        {
            storeIndex++;
            swap(array, storeIndex, start);
        }
        start++;
    }
    swap(array, storeIndex + 1, stop);
    return storeIndex + 1;
};
quickSort = function(array, startIndex, stopIndex, compare, swap)
{
    var pivot, stack, start, top;

    stack = new Array(stopIndex - startIndex + 1);
    top = -1;

    stack[++top] = startIndex;
    stack[++top] = stopIndex;

    while (top > -1)
    {
        stopIndex = stack[top--];
        startIndex = stack[top--];

        pivot = partition(array, startIndex, stopIndex, compare, swap);

        if (pivot - 1 > startIndex)
        {
            stack[++top] = startIndex;
            stack[++top] = pivot - 1;
        }

        if (pivot + 1 < stopIndex)
        {
            stack[++top] = pivot + 1;
            stack[++top] = stopIndex;
        }
    }
};
})();

```

Using the library

These examples explain how to use this code.

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```

//
//Plain Sort

```

```
//
var plainSort = [4, 7, 6, 5, 7, 0, 1, 5, 10, 10, 8];
plainSort.quickSort();
console.log(JSON.stringify(plainSort));
//Prints: [0,1,4,5,5,6,7,7,8,10,10]

//
//Sort With Custom Compare Function
//
var descendingOrder = [4, 7, 6, 5, 7, 0, 1, 5, 10, 10, 8];
descendingOrder.quickSort(function(a, b)
{
    //Descending order compare
    return a > b;
});
console.log(JSON.stringify(descendingOrder));
//Prints: [10,10,8,7,7,6,5,5,4,1,0]

//
//Sort multiple arrays with a custom compare
//
var table =
{
    "employeeName": ["Jane", "John", "Tom", "Alex", "Mary"],
    "id": [10, 5, 7, 3, 0]
};
table.employeeName.quickSort(function(a, b)
{
    //Strings have to be compared using the localeCompare function
    return (a || "").localeCompare(b) < 0;
}),
function(array, index1, index2)
{
    //Sorts both arrays in the 'table' object
    var temp = array[index1];
    array[index1] = array[index2];
    array[index2] = temp;

    temp = table.id[index1];
    table.id[index1] = table.id[index2];
    table.id[index2] = temp;
});
console.log(JSON.stringify(table));
//Prints:{"employeeName":["Alex","Jane","John","Mary","Tom"],"id":[3,10,5,0,7]}
```

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