

| Array                                                                                                                                                                                  | List                                                                                                   | Queue                                                                                          |
|----------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------------------------------------------|------------------------------------------------------------------------------------------------|
| <b>Declaration and initialization</b><br><pre>let array = ['cyber', 'sapientia']; let also = new Array(3);</pre>                                                                       | <b>Creation</b><br><pre>const list = new List();</pre>                                                 | <b>Creation</b><br><pre>let queue = new Queue();</pre>                                         |
| <b>Adding an element</b><br><pre>array[3] = 'statistics';</pre>                                                                                                                        | <b>Adding an element</b><br><pre>list.add(1); list.add('thead');</pre>                                 | <b>Adding an element</b><br><pre>queue.enqueue(1);</pre>                                       |
| <b>Setting a value</b><br><pre>array[1] = 'security';</pre>                                                                                                                            | <b>Removing an element</b><br><pre>list.remove(2);</pre>                                               | <b>Fetch of the first element</b><br><pre>queue.front();</pre>                                 |
| <b>Deleting an element</b><br><pre>delete array[3];</pre>                                                                                                                              | <b>Setting a value</b><br><pre>list.set(0, 1337);</pre>                                                | <b>Removing an element</b><br><pre>queue.dequeue();</pre>                                      |
| <b>Looping</b><br><pre>array.forEach(function(item) {     console.log(item); });</pre>                                                                                                 | <b>Checking existence of a value</b><br><pre>list.contains(1);</pre>                                   | <b>Checking the existence of an element</b><br><pre>queue.contains(7);</pre>                   |
| <b>Checking the existence of a value #1</b><br><pre>array.includes('cyber');</pre>                                                                                                     | <b>Looping</b><br><pre>for(let i = 0; i &lt; list.size(); i++) {     console.log(list.get(i)); }</pre> | <b>Stack</b>                                                                                   |
| <b>Checking the existence of a value #2</b><br><pre>array.indexOf('statistics') !== -1</pre>                                                                                           | <b>The type SortedList has the same methods, but ensures that the values are sorted.</b>               | <b>Creation</b><br><pre>let stack = new Stack();</pre>                                         |
| <b>Checking the existence of a value #3</b><br><pre>for (let i = 0; i &lt; array.length; i++) {     if (array[i] === searchValue) {         found = true;         break;     } }</pre> | <b>Dictionary</b>                                                                                      | <b>Adding an element</b><br><pre>stack.push(1);</pre>                                          |
| <b>Checking the existence of a value #4</b><br><pre>array.find(item =&gt; item === searchValue);</pre>                                                                                 | <b>Creation</b><br><pre>let dict = new Dictionary();</pre>                                             | <b>Fetching top of stack</b><br><pre>stack.peek();</pre>                                       |
| <p>Arrays are also used to implement List, Queue, Stack. For these data structures I'll create a JS class that exposes useful methods.</p>                                             | <b>Adding an key-value pair</b><br><pre>dict.add('frequency', 20);</pre>                               | <b>Removing an element</b><br><pre>stack.pop();</pre>                                          |
|                                                                                                                                                                                        | <b>Setting a value for a key</b><br><pre>dict.set('percentage', 40.10);</pre>                          | <b>SortedSet</b>                                                                               |
|                                                                                                                                                                                        | <b>Removing a key</b><br><pre>dict.remove('percentage');</pre>                                         | <b>Creation</b><br><pre>let sortedSet = new SortedSet();</pre>                                 |
|                                                                                                                                                                                        | <b>Checking existence of a key</b><br><pre>dict.hasKey('frequency');</pre>                             | <b>Adding an element</b><br><pre>sortedSet.add(3);</pre>                                       |
|                                                                                                                                                                                        | <b>Checking existence of a value</b><br><pre>dict.hasValue(20);</pre>                                  | <b>Removing an element</b><br><pre>sortedSet.delete(3);</pre>                                  |
|                                                                                                                                                                                        |                                                                                                        | <b>Checking the existence of an element</b><br><pre>sortedSet.has(1);</pre>                    |
|                                                                                                                                                                                        |                                                                                                        | <b>Looping</b><br><pre>for(element in sortedSet.toArray()) {     console.log(element); }</pre> |
| <b>LinkedList</b>                                                                                                                                                                      | <b>HashSet</b>                                                                                         |                                                                                                |

#### Creation

```
let linkedList = new LinkedList();
```

#### Adding an element

```
linkedList.append(3);  
linkedList.prepend(1);  
linkedList.addAt(1, 3);
```

#### Fetch of the head value

```
linkedList.getFirstHead();
```

#### Get the value of a node

```
linkedList.getValueAt(2);
```

#### Removing an element

```
linkedList.removeAt(1);  
linkedList.delete(7);
```

#### Check existence of a value

```
linkedList.contains(7);
```

#### Looping

```
for (const element of linkedList)  
{  
    console.log(element);  
}
```

#### Creation

```
let hashSet = new HashSet();
```

#### Adding an element

```
hashSet.add(1);
```

#### Removing an element

```
hashSet.delete(1);
```

#### Checking the existence of an element

```
hashSet.has(3);
```

#### Looping

```
let keys = hashSet.values();  
for(let i = 0; i < keys.length; i++)  
{  
    console.log(keys[i]);  
};
```

The HashSet is pretty similar to the Dictionary, but it doesn't have values; it just uses the keys.



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