

Booleans: the result of comparisons, only have 2 possible values: true or false.

Example 1: $a=3$ so $a<5$ is true. $b=true$.

```
var a = 3;
var b = (a < 5);
console.log(b);
```

```
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true
```

Example 2: $10<32$, so function return true. 40 and $50 >32$, so function return false.

```
/**
 * Returns true if the input
 * parameter (temp) is at or
 * below 32, false otherwise.
 */
var isFreezing = function(temp) {
  if (temp <= 32){
    return true;
  }else{
    return false;
  }
};

// Test cases:

console.log ("Is 50 freezing?" + isFreezing(50));
console.log ("Is 10 freezing?" + isFreezing(10));
console.log ("Is 40 freezing?" + isFreezing(40));
```

```
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Is 50 freezing?false
Is 10 freezing?true
Is 40 freezing?false
```

Example3: To calculate the average of 93,97 and 82, we first define an array named “a” to store these three numbers, then sum them up with a for-loop. We can finally get the average through dividing variable “sum” by a.length, which is the quantity of elements in this array.

```
var a = [ 93, 97, 82 ];
var sum = 0;

// Loop through each number:
for (var i = 0; i < a.length; i++){
  // Get the current number we are looking at:
  var num = a[i];
  sum += num; // Same as: sum = sum + num

  console.log("i=" + i + ", num=" + num + ", sum=" + sum);
}

var avg = sum / a.length;
console.log("The average grade is:" + avg);
```

```
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i=0, num=93, sum=93
i=1, num=97, sum=190
i=2, num=82, sum=272
The average grade is:90.66666666666667
```

Example 4: Similar as example 3, we store the grades in an array named “grades”, use a for-loop to sum them up, and divide the total score with the quantity of elements in the array to get the average GPA. But as the grades are letters, we have to translate each of them into related number using if statements

in the loop.

```
var calcGPA = function(grades){
  var sum =0;

  // grades is an array
  // ...for-loop through each elem
  for (var i=0; i<grades.length; i++){
    var grade = grades[i];

    if (grade == "A" || grade == "A+") { sum += 4;}
    if (grade == "A-") { sum += 3.67;}
    if (grade == "B+") { sum += 3.33;}
    if (grade == "B") { sum += 3.00;}
    if (grade == "B-") { sum += 2.67;}
    if (grade == "C+") { sum += 2.33;}
    if (grade == "C") { sum += 2.00;}
    if (grade == "C-") { sum += 1.67;}
    if (grade == "D+") { sum += 1.33;}
    if (grade == "D") { sum += 1.00;}
    if (grade == "D-") { sum += 0.67;}
    console.log("i="+ i + ", grade=" + grade)
    console.log("i="+ i + ", sum=" + sum)
  }

  return (sum / grades.length);
};

var gpa = calcGPA(["A", "C", "B+", "A-", "B"]);
console.log("My GPA was:" + gpa);
```

```
Run Sess
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i=0, grade=A
i=0, sum=4
i=1, grade=C
i=1, sum=6
i=2, grade=B+
i=2, sum=9.33
i=3, grade=A-
i=3, sum=13
i=4, grade=B
i=4, sum=16
My GPA was:3.2
```