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**Skill 35.1 Exercise 1**

If an array of integers contain the following elements,

89 42 -3 13 109 70 2

Write the function `search`, that can be implemented as illustrated below,

```
var arr[] = {2, 3, 4, 10, 40};  
var x = 10;  
var result = search(arr, x);  
if(result == -1)  
    console.log("Element is not present in array");  
else  
    console("Element is present at index " + result);  
}
```

//complete the search function below.

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**Skill 35.2 Exercise 1**

For which of the following arrays could a binary search be applied? Explain.

{1, 10, 22, 32, 100, 200, 302}

{x, y, z, a, b, c, d, f}

{and, ant, bat, cat, dog, rat}

{300.12, 200, 100, 50, 2, 0, -80}

**Skill 35.2 Exercise 2**Consider the following `binarySearch` function. The function correctly performs a binary search.

```
/** Precondition: data is sorted in increasing order. */  
  
function binarySearch(data, target) {  
  
    var start = 0;  
    var end = data.length - 1;  
  
    while (start <= end) {  
        var mid = Math.floor((start + end) / 2);      /* Calculate midpoint */  
  
        if (target < data[mid]) {  
            end = mid - 1;  
        } else if (target > data[mid]) {  
            start = mid + 1;  
        } else {  
            return mid;  
        }  
    }  
    return -1;  
}
```

Consider the following code segment.

```
var values = [1, 2, 3, 4, 5, 8, 8, 8];  
var target = 8;
```

What value is returned by the call `binarySearch(values, target)` ?Suppose the `binarySearch` method is called with an array containing 2,000 elements sorted in increasing order.What is the maximum number of times that the statement indicated by `/* Calculate midpoint */` could execute?

AP Computer Science Principles  
Ticket Out the Door  
Set 35: Searches

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