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JS Function Challenge II

CHALLENGE 1 = GENERATE PATTERN

Variables	Value
result	"" → "1 \n" → "1 \n1 2 \n" → "1 \n1 2 \n1 2 3 \n"
i	1 → 2 → 3
j	1 → (1,2) → (1,2,3)

PREDICTED OUTPUT = “1
1 2
1 2 3“

EXPLANATION = Based on the T-diagram, the variable result starts as an empty string. As the outer loop (i) runs from 1 to 3, the inner loop (j) adds numbers to result. After each loop of j, a newline is added. The table shows how result grows step by step until the final pattern is formed and returned, which matches the printed output.

CHALLENGE 2 = SWAP FIRST AND LAST

Variables	Value
numbers	[10, 20, 30, 40]
first	10
last	40
arr	[10,20,30,40] → [20,30,40] → [20,30] → [40,20,30] → [40,20,30,10]

PREDICTED OUTPUT = “[40, 20, 30, 10]
[40, 20, 30, 10]“

EXPLANATION = The T-diagram shows that the array starts as [10, 20, 30, 40]. The first value is removed and stored in first, and the last value is removed and stored in last. The table then shows how the array changes after unshift() and push() are used. Because the array is modified directly, both the returned value and the original array have the same final result.

CHALLENGE 3 = FILTER PASSING GRADES

Variables	Value
grades	[85, 45, 90, 60]
passing	[ ] → [85] → [45,85] → [45,85,90] → [60,45,85,90]
grade	85 → 45 → 90 → 60

PREDICTED OUTPUT = “[60, 45, 85, 90]“

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EXPLANATION = According to the T-diagram, the passing array starts empty. As each grade is processed, grades that are 70 or higher are added to the end, while grades below 70 are added to the beginning. The table clearly shows how passing changes after each grade is checked. The final value in the table matches the returned output.

CHALLENGE 4 = UPDATE TASK STATUS

Variables	Value
Tasks	[{id:1,false}, {id:2,true}]
Task 1	{ completed:false → true }
Task 2	{ completed:true → false }
Tasks	[{id:1,true}, {id:2,false}]

PREDICTED OUTPUT = "[{ id: 1, completed: true }, { id: 2, completed: false }]
[{ id: 1, completed: true }, { id: 2, completed: false }]"

EXPLANATION = The T-diagram shows each task object being accessed one at a time. For each task, the completed value is flipped from false to true or from true to false. The table shows the updated values after each loop iteration. Since objects are reference types, the final table values match both console outputs.

CHALLENGE 5 = FIND VALUE

Variables	Value
arr	[5, 12, 8, 130, 44]
target	12 → 100
i	0 → 1 (stop) / 0 → 4

PREDICTED OUTPUT = "Found at index 1
Not found"

EXPLANATION = Based on the T-diagram, the loop checks each index of the array. When the target value is found, the function returns immediately, which is shown in the table when the loop stops early. If the target is not found, the table shows the loop reaching the end of the array and returning "Not found". The predicted outputs match the values shown in the table.

CODE:

```
// Challenge 1
function generatePattern() {
  let result = "";
  for (let i = 1; i <= 3; i++) {
    for (let j = 1; j <= i; j++) {
      result += j + " ";
    }
    result += "\n";
  }
  return result;
}
```

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```
console.log(generatePattern());

// Challenge 2

function swapFirstLast(arr) {
  let first = arr.shift();
  let last = arr.pop();
  arr.unshift(last);
  arr.push(first);
  return arr;
}

let numbers = [10, 20, 30, 40];
console.log(swapFirstLast(numbers));
console.log(numbers);


// Challenge 3

function filterPassingGrades(grades) {
  let passing = [];
  for (let grade of grades) {
    if (grade >= 70) {
      passing.push(grade);
    } else {
      passing.unshift(grade);
    }
  }
  return passing;
}

let scores = [85, 45, 90, 60];
console.log(filterPassingGrades(scores));



// Challenge 4

function updateStatus(tasks) {
  for (let task of tasks) {
    task.completed = !task.completed;
  }
  return tasks;
}

let taskList = [
  { id: 1, completed: false },
  { id: 2, completed: true }
];

console.log(updateStatus(taskList));
console.log(taskList);
```

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```
// Challenge 5

function findValue(arr, target) {
  for (let i = 0; i < arr.length; i++) {
    if (arr[i] === target) {
      return `Found at index ${i}`;
    }
  }
  return "Not found";
}

let data = [5, 12, 8, 130, 44];
console.log(findValue(data, 12));
console.log(findValue(data, 100));
```

OUTPUT: