Power of Two

Problem Statement:

Write a recursive function `isPowerOfTwo(n)` that returns `true` if `n` is a power of 2, otherwise `false`.

Example 1:

Input: 8

Process: (8 → 4 → 2 → 1)

Output: true

Example 2:

Input: 18

Output: false

Concepts:

Power of Two: A number is a `power of 2` if it can be divided by `2` repeatedly until it reaches `1`.

Base Case: `n == 1 → true`

Invalid Case: n < 1 or n % 2 != 0 → false

Recursive Case: isPowerOfTwo(n / 2)

Time & Space Complexity:

Time Complexity: O(log n)

Space Complexity: O(log n) `Due to recursion stack`

JavaScript | Python | Java | C++ | C | C#

```
function isPowerOfTwo(n) {
  if (n === 1) return true;
  else if (n < 1 || n % 2 !== 0) return false;
  return isPowerOfTwo(n / 2);
}

console.log(isPowerOfTwo(8)); // true
console.log(isPowerOfTwo(18)); // false
```

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Power of Two - DSA Notes

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