Java Bit Manipulation Cheat Sheet

Bitwise Basics

- Check if a number is even or odd:

```
if ((num & 1) == 0) System.out.println("Even"); else System.out.println("Odd");
```

- Get the ith bit:

```
int bit = (num >> i) & 1;
```

- Set the ith bit:

```
num = num | (1 << i);
```

- Clear the ith bit:

```
num = num & ~(1 << i);
```

- Toggle the ith bit:

```
num = num ^ (1 << i);
```

- Count set bits:

```
int count = 0;
while (num != 0) {
    count += (num & 1);
    num >>= 1;
}
```

- OR use: Integer.bitCount(num);

Popular Bit Manipulation Problems

- Check if number is power of 2:

```
boolean isPowerOfTwo(int n) {
    return (n > 0) && ((n & (n - 1)) == 0);
}
```

- Find non-repeating element:

```
int result = 0;
for (int num : arr) {
```

```
        result ^= num;
    }
```

- Swap two numbers without temp:

```
    a = a ^ b;
    b = a ^ b;
    a = a ^ b;
```

Debugging Help

Use: System.out.println(Integer.toBinaryString(num)); to visualize binary form