Task 1: Bit Manipulation Basics

Create a function that counts the number of set bits (1s) in the binary representation of an integer. Extend this to count the total number of set bits in all integers from 1 to n.

```
public class CountSetBitsDemo {


	static int countTotalSetBits(int n) {
		int count=0;
		for(int i=0;i<16;i++) {
			int blocksize=1<<(i+1);
			int fullBlocks=(n+1)/blocksize;
			count+=fullBlocks*(blocksize/2);
			int remainder=(n+1)%blocksize;
			if(remainder>blocksize/2) {
				count+=remainder-(blocksize/2);
			}//if
		}//for
		return count;
	}
	public static int countSetBits(int n) {
		int count=0;
		while(n>0) {
			n&=(n-1);
			count++;
		}//while
		return count;
	}//fun


	public static void main(String[] args) {
		int n=5;
		int totalSetBits=countTotalSetBits(n);
		System.out.println("Total set bits from 1 to "+n+":"+totalSetBits);
```

```
int n=29;
                System.out.println("Number of set bits in "+n+" is : "+countSetBits(n));

        }
```