



### Question 1: Logical Operations

```
  1010 0001
AND 0101 1111
-----
  0000 0001
```

```
  1010 0001
OR  0101 1111
-----
  1111 1111
```

```
  1010 0001
XOR 0101 1111
-----
  1111 1110
```

### Question 2: Shifting

Assuming 8-bit, 2's complement binary numbers, what is the result of the following?

- 00001100 << 3  
=01100000 (96) (Note:  $12 * 8 = 96$  )

- 10100001 >> 3  
=11110100

- 10100001 >>> 3  
=00010100