

COMP 122/L
Summer 2023

Bitwise Operations

All answers should be in 8-bit binary.

1.) What is $1011\ 1100 \ll 3$?

2.) What is $0110\ 1101 \gg 2$, for logical shift right?

3.) What is $0110\ 1101 \gg 2$, for **arithmetic** shift right?

4.) What is $1110\ 0010 \gg 4$, for logical shift right?

5.) What is $1110\ 0010 \gg 4$, for **arithmetic** shift right?

6.) What is:

```
    11001110
&   10110101
```

7.) What is:

```
    11000001
|   10110101
```

8.) What is:

$$\begin{array}{r} 11001110 \\ \wedge 10110100 \end{array}$$

9.) Assume you have an unknown 8-bit number. Specify the bitmask and operation needed to **isolate** the bit in position 6. The result of the mask and the operation should be all zeros if the bit in position 6 is a 0, and the result should be non-zero otherwise.

10.) Assume you have an unknown 8-bit number. Specify the bitmask and operation needed to **set** the bit in position 6. The result of the mask and the operation should be the same as the original number, except the bit in position 6 will always be set (1).

11.) Assume you have an unknown 8-bit number. Specify the bitmask and operation needed to **unset** the bit in position 6. The result of the mask and the operation should be the same as the original number, except the bit in position 6 will always be unset (0).