Virginia Tech
ECE 4500: Fundamentals of Computer Systems

Example of Division

Consider dividing 31 by 3 assuming 8-bit unsigned integer representation. The quotient will require at most an 8-bit representation. Note that since 3 does not divide evenly into 38, there will be a remainder.

- 38 is: 0010 0110
- 3 is: 0000 0011

The procedure is the same as standard "long-hand" division, except using binary arithmetic rather than decimal arithmetic.

```
          0  0  0  0  1  1  0  0     Final quotient is 1100 = decimal 12
       ---------------------------
1  1   | 0  0  1  0  0  1  1  0
          -  1  1                    Bit 3 = 1
       ---------------------------
          0  0  0  0  1  1  1  0
             -  1  1                 Bit 2 = 1
       ---------------------------
          0  0  0  0  0  0  1  0     Remainder = 10 = decimal 2
```

The final quotient is 0000 1100 (decimal 12) with a reminder of 0000 0010 (decimal 2).