Floating Point, Lab 7

Exercise

- Number 122.75_{10}

- Convert to:
  - Binary
  - Normalized Decimal Scientific Notation
  - Normalized Binary Scientific Notation

Exercise

- To Binary
  - 122.75
    - 122 = 1111010
    - 0.75 = .11
    - So, 122.75 = 1111010.11

- Normalized Decimal Scientific Notation
  - $1.2275 * 10^2$

- Normalized Binary Scientific Notation
  - $1.11101011 * 2^6$

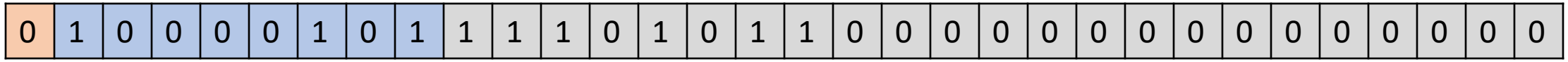
Now, Convert to IEEE 754 format

$$\mathbf{1.11101011 * 2^6}$$

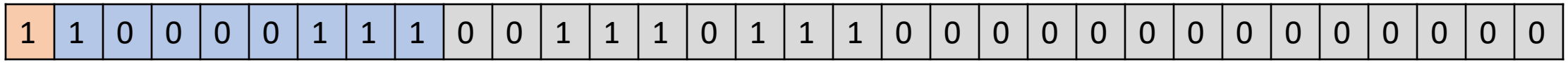
- Fraction
  - 11101011
- Biased Exponent
  - exp + 127 = 127 + 6 = 133 = 10000101
- Significand
  - 1.11101011
- Sign:
  - 0

Convert to IEEE 754

Convert to IEEE 754



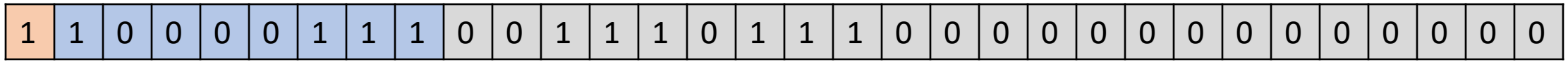
Convert from IEEE 754 to decimal



- **Sign**
  - 1
- **Exponent**
  - 10000111 -127 = 135-127 = 8

- **Fraction**
  - 001110111

Convert from IEEE 754 to decimal



- $(-1)^{sign} * 1.fraction * 2^{exp}$
  - $(-1)^{1} * 1.001110111 * 2^{8}$
  - $-1.001110111 * 2^{8} = -100111011.1 = -315.5$