

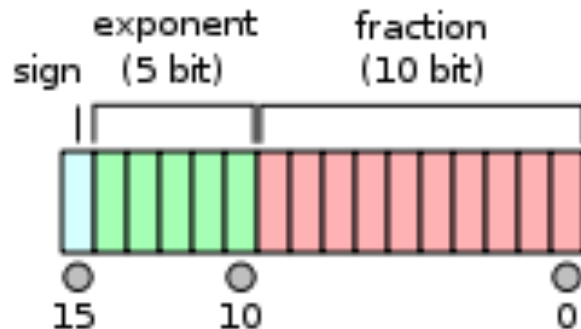
Introduction to Computer Architecture

CISC 3310 Principles of Computer Architecture
Lab Activity

Data Representation - Exercises

Example: Using IEEE 754 Floating Point Standard *half-precision binary floating point*

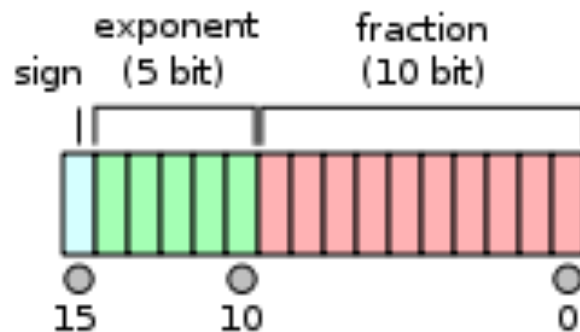
- IEEE 754 *half-precision binary floating point* (or binary16 for short) uses 5 bits for exponents => we get a 15 bias
 - Can represent any exponent between -15 and 16
- Uses 10 bits for the binary fraction



Example: Using IEEE 754 Floating Point Standard *half-precision binary floating point*

- IEEE 754 *half-precision binary floating point* (or binary16 for short) uses 5 bits for exponents => we get a 15 bias
 - Can represent any exponent between -15 and 16
- Uses 10 bits for the binary fraction
- Floating Number X calculation:

$$x = (-1)^s \times (1 + \text{Fraction}) \times 2^{(\text{Exponent} - \text{Bias})}$$



Floating Point Numbers

- Convert 100.25_{10} to IEEE 754 *half-precision binary floating point*
- Convert 1010011010000000 in IEEE 754 *half-precision binary floating point* representation to a decimal number

Questions?

