Floating Point Representation IEEE Standard 754

Precisions

Precision	Sign Field s	Exponent Field exp	Fraction Field $frac$
Half	1 Bit	5 Bits	16 Bits
Single	1 Bit	8 Bits	23 Bits
Double	1 Bit	11 Bits	52 Bits

Further, let e be the number of exponent field bits and let $bias$ be $2^{e-1} - 1$.

Numerical Form

$$(-1)^s \cdot M \cdot 2^E$$

Encoding

Values	Condition	Exponent Encoding	Significand Encoding
Normalized Values	$exp \neq 000...0$, $exp \neq 111...1$	$exp - bias$	Implied leading one
Denormalized Values	$exp = 000...0$		
Special Values	$exp = 111...1$	$1 - bias$, *not* $0 - bias$	Implied leading zero