1) IEEE 754 floating Representation

1) Single Precision - 32 bit

S	E	M
1	8	23 bits.

1) S (Sign bit)
2) E (exponent)
3) M (mantissa (or) fractional part)

2) double Precision - 64 bit.

S	E	M
1	11	52 bits.

⇒ Single Precision to decimal conversion.

$$x_d = -1^S \times (1+M) \times 2^{E-127}.$$

⇒ double precision to decimal Conversion.

$$x_d = -1^S \times (1+M) \times 2^{E-1023}$$

PRECISION: value (or) Number:

it represent the how much closer to the acutual value.

Ex:- $1/6 = 0.166666666666\ldots\ldots$

Single precision.

S	E	M
0	0111100	01010101010101010101010
	124	(2AAAAAA) = [illegible]
	(-3)	

[illegible]

$\Rightarrow (-1)^0 \times 2^{-3} \quad (1 + 0.3333334) = 0.166666675$

double Precision:

S	E	M
0	3FCh (1020)	5555555555555h

$= (-1)^0 \times 2^{-3} \times (1 + 0.3333333333333333)$

$= 0.1666666666666$

So we can see that there is no change in sign bit (0) exponent so only effect the precision is fraction part (mantissa).