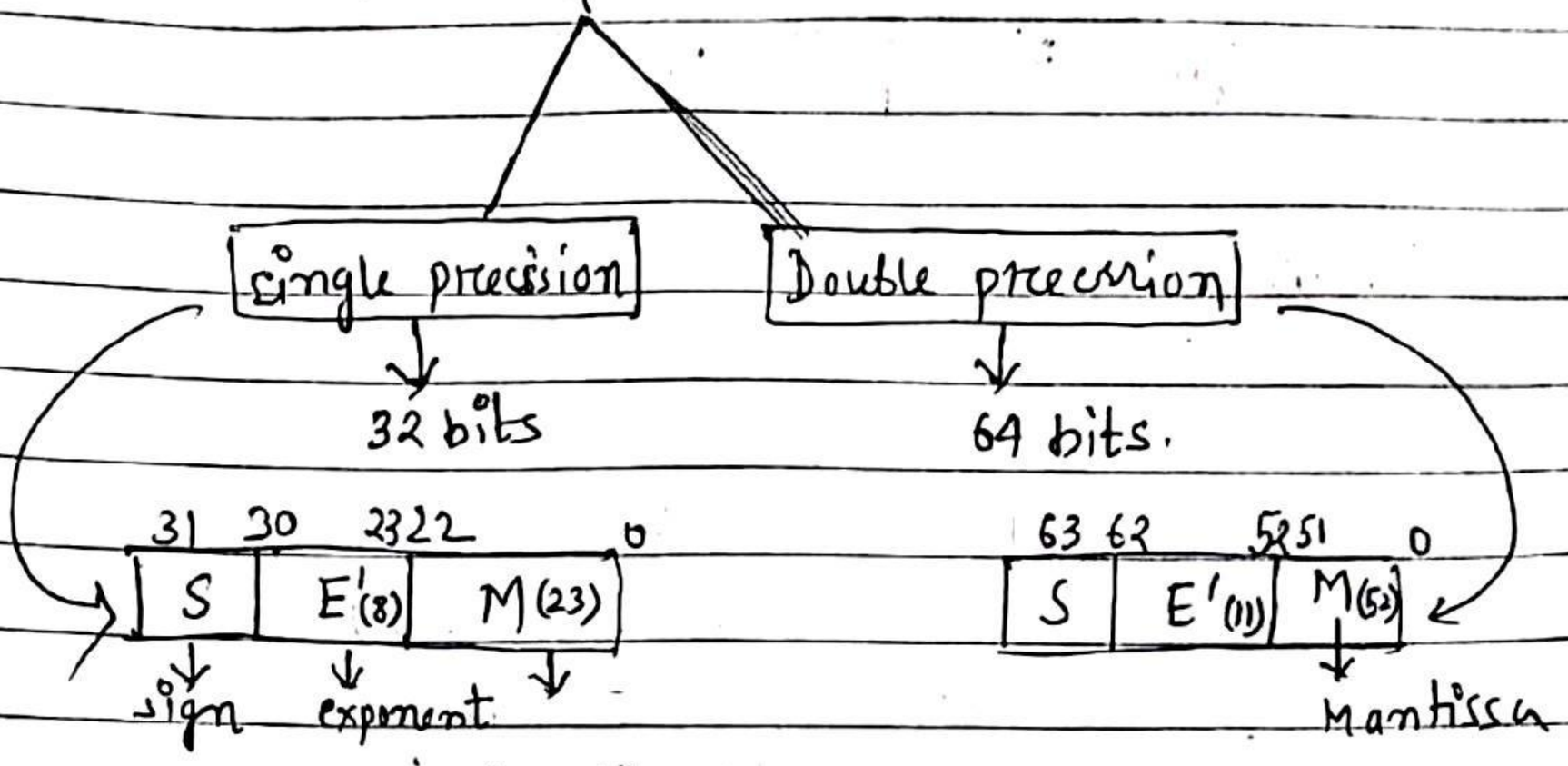
Date :

Computers Arithmetic

- **IEEE Floating point Representation =**



here, $E' = E + bias$

single -127

Double -1023

① ex: $(1460.125)_{10}$

$\rightarrow (1460.125)_{10}$

$\rightarrow (10110110100.001)_2$

↓ Normalise

$\rightarrow 1.0110110100001 \times 2^{10}$

(M)

single:

$S = 0$

$E = 10$

$M = 01101101000001$

$E' = E + bias$

$= 10 + 127 = (137)_{10} = 10001001.$

1 bits	8 bits	23 bits
0	10001001	01101101001 ⋯ 0
sign	E'	M

Double:

$S = 0$

$E = 10$

$E' = 10 + 1023 = 1033$

$= (10000001001)$

1 bits	11 bits	53 bits
0	10000001001	0110110100001 ⋯ 0
S	E'	M

② ex: The negative number (-0.750)

$\rightarrow (0.750)_{10} \rightarrow 0.11$

↓Normalization

$\rightarrow 1.1 \times 2^{-1}$

$0.750 \times 2 = 1.5$

$0.5 \times 2 = 1.0$

Single:

$S = 1$

$E = -1$

$M = 1$

$E' = E + bais = -1 + 127 = (126)_{10} = (01111110)_2$

1 bits	8 bits	23 bits
1	01111110	1000 ⋯ 0

8421

1011	1111	0100	0000	0000	0000	0000	0000
(11)	(15)	↓	↓	1	1	1	1
↓	↓						
B	F	4	0	0	0	0	0

$(BF400000)_{16}$