

AS per IEEE 754

Normal numbers:

$$(-1)^S \times 1.f \times 2^{e-127}$$

for Normal numbers range of  $e$  is  $(0, 255)$  and leading bit is "1". That means we can represent numbers  $(1.7549435 \times 10^{-38}, 3.4028347 \times 10^{38})$

→ To represent even smaller numbers than  $1.7549435 \times 10^{-38}$  they come up with leading bit convention. and name those numbers as subnormal numbers.

Subnormal numbers:

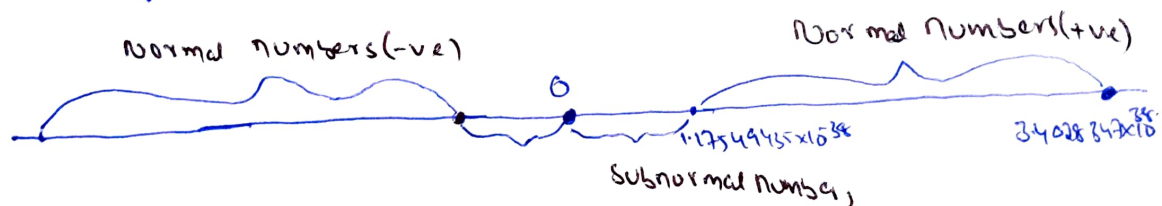
$$(-1)^S \times 0.f \times 2^{-126}$$

\*  $e = 0$

\* exponent is fixed to  $-126$

→ Smallest number can be represented is  $1.40129846 \times 10^{-45}$  which is more near to the actual zero.

→ range of subnormal numbers is  $(1.40129846 \times 10^{-45}, 1.7549435 \times 10^{-38})$



\* Zero can be represented when both  $e$  and  $f$  are zero's.