

ULP; X^+ and X^- ; DELTA:

$$X = 2^E \times b_0.b_1b_2 \dots b_{P-1}$$

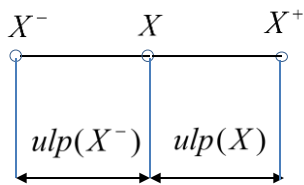
$$ULP(X) = 2^E \times 0.00 \dots 0 \underset{P-1}{1} = 2^E \times 2^{-P+1}$$

$$ULP(X) = 2^{E+1-P} = 2^{e-P}$$

For $X = 0.0$: $E = E_{\min}$.

$$X + ULP(X) = X^+$$

$$X^- + ULP(X^-) = X$$



DELTA:

Rounding to the nearest is assumed.

For $X > 0$:

$DELTA(X)$ = the smallest format number, for which: $X + DELTA(X) > X$.

For $X < 0$: $DELTA(|X|)$ is taken.