

Floating-Point Arithmetic (Stallings)

$$X = X_S \times B^{X_E}$$

$$Y = Y_S \times B^{Y_E}$$

$$X+Y = (X_S \times B^{X_E - Y_E} + Y_S) B^{Y_E}$$

$$X - Y = (X_S X_B^{X_E - Y_E} - Y_S) B^{Y_E}$$

$$X * Y = (X_S * Y_S) * B^{X_E + Y_E}$$

$$\frac{x}{y} = \left(\frac{x_s}{y_s} \right) B^{x_E - y_E}$$

$$y_E \geq x_E$$

★ $X_E + Y_E$

$$x_E = \text{exact} + K$$

$$Y_E = \text{exact} + k$$

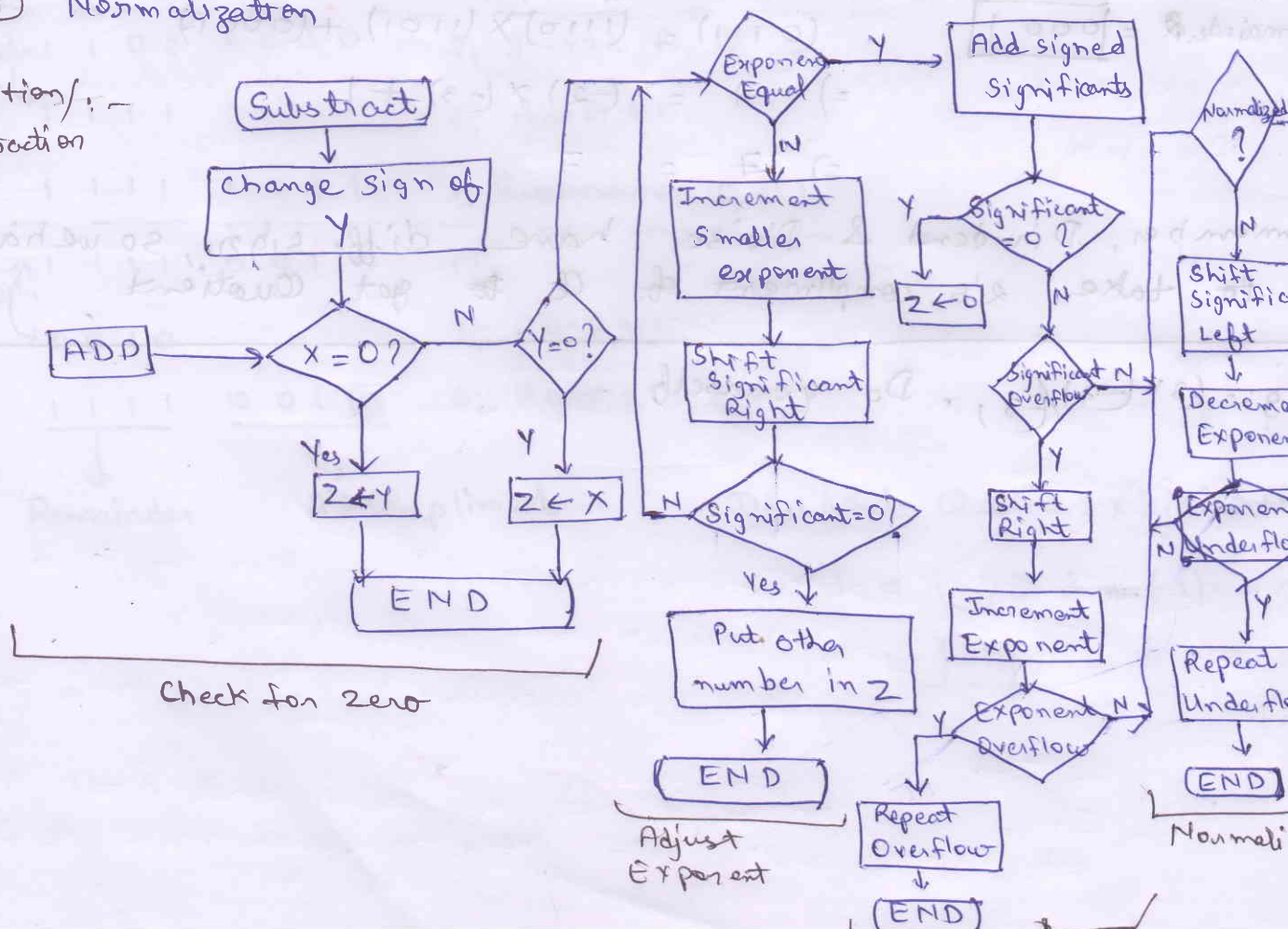
$$x_F + y_F = \text{exact} + 2k$$

So, we ~~needed~~ to subtract k again

Steps:

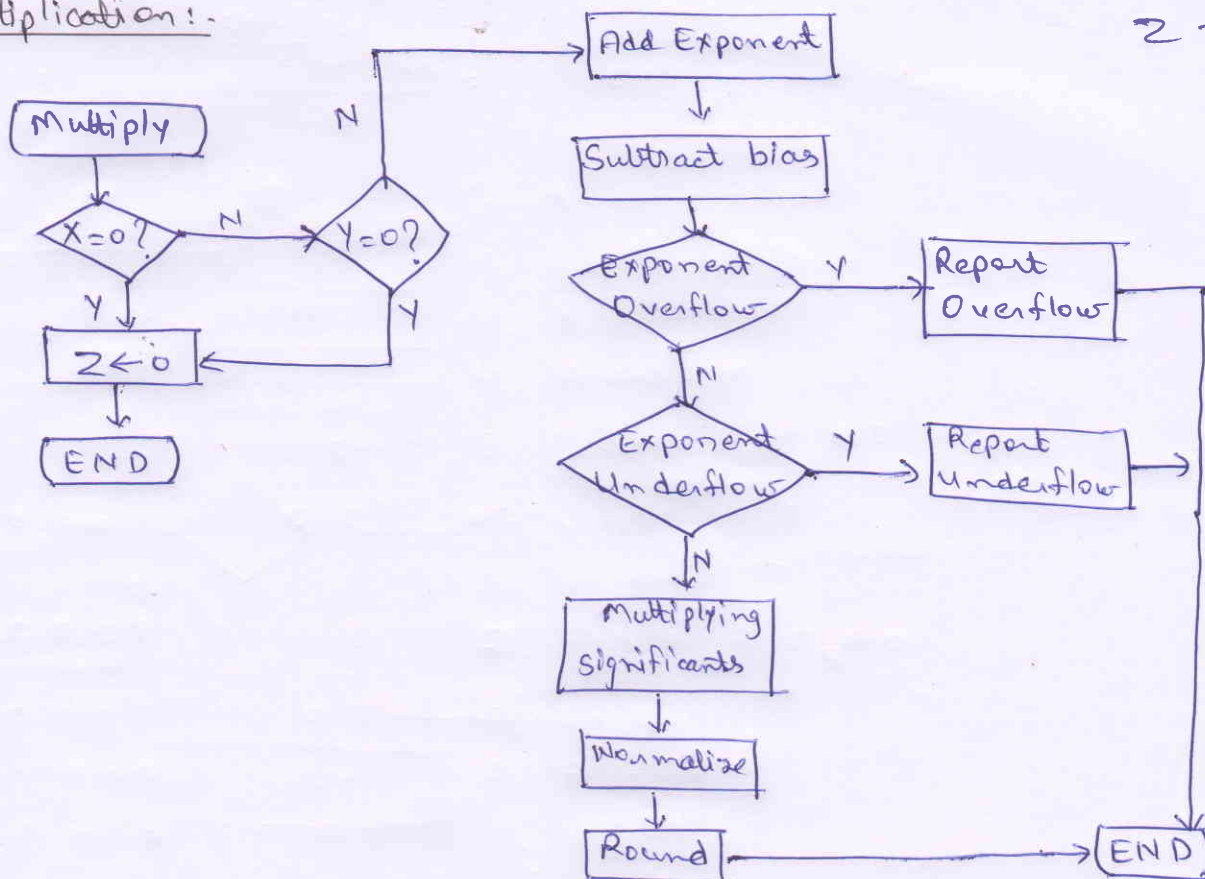
- ① Check for zero.
- ② Align the significant.
- ③ Add/subtract b/w the significant
- ④ Normalization

Addition: -
Subtraction



Multiplication:-

$$Z = x * y$$



Divide:-

$$Z = \frac{x}{y}$$

