Curve Fitting : Handout

1. Normal eqns for fitting straight line:

$$y = a + bx$$
$$\Sigma y = na + b\Sigma x$$
$$\Sigma xy = a\Sigma x + b\Sigma x^2$$

$$y = ax + b$$
$$\Sigma y = a\Sigma x + nb$$
$$\Sigma xy = a\Sigma x^2 + b\Sigma x$$

2. Normal eqns for fitting 2nd order polynomial:

$$y = a + bx + cx^2$$
$$\Sigma y = na + b\Sigma x + c\Sigma x^2$$
$$\Sigma xy = a\Sigma x + b\Sigma x^2 + c\Sigma x^3$$
$$\Sigma x^2 y = a\Sigma x^2 + b\Sigma x^3 + c\Sigma x^4$$

3. Normal eqns to fit curve of the type $y = ax^b$

Take log both the side

$$\log y = \log a + b \cdot \log x$$

ie $Y = A + bX$ where $Y = \log y$, $A = \log a$, $X = \log x$

- Write Normal eqns for $Y = A + bX$ & find A & b.
- Find a = antilog (A)
- substitute a, b in $y = ax^b$

4. Normal eqns to fit curve of the type $y = ab^x$

Take log both the side

$$\log y = \log a + x \cdot \log b$$

ie $Y = A + x \cdot B$ where $Y = \log y$, $A = \log a$ & $B = \log b$

- Follow same steps as pt no. 3

5. Take deviation (pick one value from the series and substract it from all other values of that series) and form new series when series is given in large digits. Normally to fit 2nd order polynomial, deviation is helpful.