LAMPIRAN

PERHITUNGAN ERROR

$$error = permintaan - peramalan$$

PERHITUNGAN MEAN

$$ME = \frac{\sum error}{n}$$

$$MAD = \frac{\sum |error|}{n}$$

$$MSE = \frac{\sum (error^2)}{n}$$

$$MAPE = 100 \times \frac{\sum (Abs.E/Y_t)}{n}$$

METODE REGRESI LINIER

$$Y'_t = a + (b \cdot t)$$

$$b = \frac{n\sum_{t=1}^{n}(t \cdot Y_t) - \sum_{t=1}^{n} Y_t \cdot \sum_{t=1}^{n} t}{n\sum_{t=1}^{n} t^2 - [\sum_{t=1}^{n} t]^2}$$

$$a = \frac{1}{n}\sum_{t=1}^{n} Y_t - \frac{1}{n} b \sum_{t=1}^{n} t$$

METODE REGRESI KUADRATIS

$$Y'_t = a + (b \cdot t) + (c \cdot t^2)$$

$$\gamma = \left[\sum_{t=1}^{n} t^2\right]^2 - n\sum_{t=1}^{n} t^4$$

$$\delta = \sum_{t=1}^{n} t \sum_{t=1}^{n} Y_t - n\sum_{t=1}^{n} (t \cdot Y_t)$$

$$\theta = \sum_{t=1}^{n} t^2 \sum_{t=1}^{n} Y_t - n\sum_{t=1}^{n} t^2 \cdot Y_t$$

$$\alpha = \sum_{t=1}^{n} t \sum_{t=1}^{n} t^2 - n\sum_{t=1}^{n} t^3$$

$$\beta = \left[\sum_{t=1}^{n} t\right]^2 - n\sum_{t=1}^{n} t^2$$

$$b = \frac{\gamma\delta - \theta\alpha}{\gamma\beta - \alpha^2}$$

$$c = \frac{\theta - b \cdot \alpha}{\gamma}$$

$$a = \frac{\sum_{t=1}^{n} Y_t}{n} - \frac{b \cdot \sum_{t=1}^{n} t}{n} - \frac{c \cdot \sum_{t=1}^{n} t^2}{n}$$

METODE DOUBLE EXPONENTIAL SMOOTHING

$$Y'_t = a_{t-1} + b_{t-1} \cdot m$$

PENGECUALIAN UNTUK: $S'_1 = Y_1$

$$S'_t = \alpha \cdot Y_t + (1-\alpha) S'_{t-1}$$

PENGECUALIAN UNTUK: $S''_1 = S'_1$

$$S''_t = \alpha \cdot S'_t + (1-\alpha) S''_{t-1}$$

$$a_t = 2S'_t - S''_t$$
$$b_t = \frac{\alpha}{1-\alpha}(S'_t - S''_t)$$

METODE DOUBLE EXPONENTIAL SMOOTHING HOLT

$$Y'_t = S_{t-1} + b_{t-1} \cdot m$$

PENGECUALIAN UNTUK: $S_1 = Y_1$

$$S_t = \alpha \cdot Y_t + (1-\alpha)(S_{t-1} - b_{t-1})$$

PENGECUALIAN UNTUK: $b_1 = \frac{(Y_2 - Y_1) + (Y_3 - Y_2) + (Y_4 - Y_3)}{3}$

$$b_t = \gamma \cdot (S_t - S_{t-1}) + (1-\gamma) b_{t-1}$$

STATISTIK U-THEIL

$$U = \sqrt{\frac{\left(\frac{\left(\frac{\left[\sum_{i=1}^{n-1} Y'_t - Y_t\right]}{Y_{t-1}}\right)^2}{n-1}\right)}{\left(\frac{\left(\frac{\left[\sum_{i=1}^{n-1} Y_t - Y_{t-1}\right]}{Y_{t-1}}\right)^2}{n-1}\right)}}$$

ASUMSI:
U<1, BERARTI RAMALAN LEBIH BAIK DARI NAIVE.
U=1, BERARTI RAMALAN SAMA BAIK DENGAN NAIVE.
U>1, BERARTI NAIVE LEBIH BAIK DARI RAMALAN.

MOVING RANGE

$$MR_t = |error_t - error_{t-1}|$$

$$\overline{MR} = \frac{\sum MR}{n-1}$$

BATAS KENDALI : $UCL = +2{,}66\,\overline{MR}$

$LCL = -2{,}66\,\overline{MR}$

AREA DALAM PETA KENDALI:

DAERAH A

DAERAH YANG DIBATASI $\pm\frac{2}{3}(2{,}66\,\overline{MR})$ ATAU $\pm 1{,}77\,\overline{MR}$.

DAERAH B

DAERAH YANG DIBATASI $\pm\frac{1}{3}(2{,}66\,\overline{MR})$ ATAU $\pm 0{,}89\,\overline{MR}$.

DAERAH C

DAERAH YANG BERADA DI ATAS ATAU DI BAWAH GARIS SUMBU *(CENTRAL LINE)*.

TRACKING SIGNAL

BENTUK PENGENDALIAN RAMALAN TRACKING SIGNAL YANG BAIK:

RSFE KECIL

NILAI TS MENDEKATI NOL

RSFE (*RUNNING SUM FORECAST ERROR)* =(KUMULATIF ERROR)

CUM. ERROR = (DARI ABS ERROR)

MAD $= \frac{Cum\ Error}{t}$

TS (*TRACKING SIGNAL)* $= \frac{RSFE}{MAD}$