Data- Mining

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[25]

Q Calculate min-max normalization of the following data:

newMax = 1, newMin = 0

marks: 8, 10, 15, 20

A $v' = \frac{v - min_A}{max_A - min_A} (new\_max_A - new\_min_A) + new\_min_A$

$min_A = 8$ $max_A = 20$

newMax = 1 newMin = 0

8 $v' = \frac{8-8}{20-8}(1-0) + 0 = 0$

10 $v' = \frac{10-8}{20-8}(1-0) + 0 = 0.1667$

15 $v' = \frac{15-8}{20-8}(1-0) + 0 = 0.5833$

20 $v' = \frac{20-8}{20-8}(1-0) + 0 = 1$

Using z-score

$$v' = \frac{v_i - \bar{A}}{\sigma_A}$$

A → mean of observation

$$= \frac{8+10+15+20}{4} = 13.25$$

S.D, $\sigma = \sqrt{\sigma^2}$

$$\sigma^2 = \left(\frac{1}{N} \sum_{i=1}^{N} x_i^2 - \bar{x}^2 \right)$$

$= \frac{1}{4}\left(8^2+10^2+15^2+20\right) - (13.25)^2$ $\quad N=4$

$= \frac{789}{4} - (13.25)^2 = 21.6875$

$\sigma = \sqrt{21.6875} = 4.657$

$Z_{score} = \frac{x-\mu}{\sigma}$

$8 \Rightarrow \frac{8-13.25}{4.657} = -1.127$

$10 \Rightarrow \frac{10-13.25}{4.657} = -0.697$

$15 = \frac{15-13.25}{4.657} = 0.376$

$20 \Rightarrow \frac{20-13.25}{4.657} = 1.45$