Cyrus Shekari
UH ID: 2042446

$$\sigma^2 = \frac{\sum (xi - \bar{x})^2}{N}$$

$$s^2 = \frac{\sum (X - \bar{X})^2}{N-1}$$

Entropy: $$H(S) = -\sum_{i=1}^{N} P_i log_2 P_i$$

$$Z = \frac{X - \mu}{\sigma}$$

Euclidean Distance: $$\sqrt{(x_1 - x_2)^2 + (y_1 - y_2)^2}$$

$$SSR = \sum (y' - \bar{y}')^2$$

Manhattan Distance: $$|x_1 - x_2| + |y_1 - y_2|$$

$$SSE = \sum (y - y')^2$$

$$SST = \sum (y - \bar{y})^2$$

$$s(i) = \begin{cases} 1 - a(i)/b(i), & \text{if } a(i) < b(i) \\ 0, & \text{if } a(i) = b(i) \\ b(i)/a(i) - 1, & \text{if } a(i) > b(i) \end{cases}$$

$$R^2 = \frac{SSR}{SST} = 1 - \frac{SSE}{SST}$$

Single Linkage: Min[smallestDist, otherPoints]

Complete Linkage: Max[smallestDist, otherPoints]

Average Linkage: [smallestDist, otherPoints] / 2

$$f(x) = \frac{1}{1 + e^{-(x)}}$$

Jaccard coefficient

$$sim_{Jaccard}(i, j) = \frac{a}{a + b + c}$$

Rule: $X \Rightarrow Y$

$$Support = \frac{frq(X, Y)}{N}$$

$$Confidence = \frac{frq(X, Y)}{frq(X)}$$

$$Lift = \frac{Support}{Supp(X) \times Supp(Y)}$$

symmetric binary variables: $$d(i, j) = \frac{b + c}{a + b + c + d}$$

asymmetric binary variables: $$d(i, j) = \frac{b + c}{a + b + c}$$