Mid Term Examination

KDD CS 513-A

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subject - Knowledge discovery and data mining

Question:1

1. Answer:- The given distant function is incorrect, because in the distant function we take square root of summation of squares between two points. The proper distant function would be:

A (0,0,0), B (0,1,0), C (0,1,1), D (1,1,1)

Distance between A and B = D (A, B) = sqrt ((0-0)2+(1-0)2 +(0-0)2)

= sqrt (1)

= 1

Distance between B and C = D (B, C) = sqrt ((0-0)2+(1-1)2 +(0-1)2)

= sqrt (1)

= 1

Distance between C and D = D (C, D) = sqrt ((0-1)2+(1-1)2 +(1-1)2)

= sqrt (1)

= 1

Distance between A and D = D (A, D) = sqrt ((0-1)2+(0-1)2 +(0-1)2)

= sqrt (3)

= 1.73

Distance between A and C = D (A, C) = sqrt ((0-0)2+(0-1)2 +(0-1)2)

= sqrt (2)

= 1.41

Distance between B and D = D (B, D) = sqrt ((0-1)2+(1-1)2 +(0-1)2)

= sqrt (2)

= 1.41

Similarly, D(B,A)= 1

D(C,B)= 1

D(D,C)= 1

D(D,A)= 1.73

D(C,A)= 1.41

D(D,B)= 1.41

This equation have to follow three properties which should be true for distance funcation

1. **D(x,y) >= 0 and D(x,y) = 0 if x=y**

The distance between the two points for the values taken is greater than zero.

1. **D(x,y) = D(y,x)**

The distance between the value for D(x,y) in the square will always be equal to D(y,x).

1. **D(x,z)<= D(x,y) + D(y,z)**

The summation for any two points will always be greater than the other point which proves that the property is appropriate