Solution Homework

TS1 = {10, 2, 5, 10, 2, 7}
TS2 = {3, 1, 15, 5, 3, 6}
TS3 = {2, 1, 4, 7, 1, 4}

$d_{Euc}(TS1, TS2) = 13.3$
$d_{Euc}(TS1, TS3) = 9.22$ — TS1 & TS3 most similar
$d_{Euc}(TS2, TS3) = 11.5$

$d_{Abs}(TS1, TS2) = 25$
$d_{Abs}(TS1, TS3) = 17$ — TS1 & TS3 most similar
$d_{Abs}(TS2, TS3) = 18$

$d_{Inf}(TS1, TS2) = 10$
$d_{Inf}(TS1, TS3) = 8$ — TS1, TS3 most similar
$d_{Inf}(TS2, TS3) = 11$

$d_{edit}(TS1, TS2) = 6$
$d_{edit}(TS1, TS3) = 6$
$d_{edit}(TS2, TS3) = 5$ — TS2, TS3 most similar

example of a solution.

new distance: $A = (a_1, \dots a_6)$, $B = (b_1, \dots b_6)$

$$d(A, B) = |a_1 - b_1| + \max_{i=2..6}(|a_i - b_i|)$$

$d(TS1, TS2) = 11$
$d(TS2, TS3) = 12$
$d(TS1, TS3) = 11$

Solution Exercise

$TS1 = \{0, 1, 2, 3, -1, 2, -2\}$
$TS2 = \{1, -1, 0.5, 3, -1, 2, 1\}$
$TS3 = \{-2, 3, 1, 0, -1, 2, 3\}$

Euclidean distance:

$$d_{Euc}(TS1, TS2) = \sqrt{(0-1)^2 + (1+1)^2 + (2+0.5)^2 + (3-3)^2 + (-1+1)^2 + (2-2)^2 + (-2-1)^2} =$$
$$= \sqrt{1+4+6.25+0+0+0+9} = \sqrt{20.25} = 4.5$$

$$d_{Euc}(TS2, TS3) = \sqrt{(1+2)^2 + (-1-3)^2 + (-0.5-1)^2 + (3-0)^2 + (-1+1)^2 + (2-2)^2 + (1-3)^2} =$$
$$= \sqrt{9+16+2.25+9+0+0+4} = \sqrt{40.25} \approx 6.34$$

$$d_{Euc}(TS1, TS3) = \sqrt{(0+2)^2 + (1-3)^2 + (2-1)^2 + (3-0)^2 + (-1+1)^2 + (2-2)^2 + (-2+3)^2} =$$
$$= \sqrt{4+4+1+9+0+0+25} = \sqrt{43} \approx 6.56$$

TS1 and TS2 are most similar

Absolute distance:

$$d_{Abs}(TS1, TS2) = |0-1| + |1+1| + |2+0.5| + |3-3| + |-1+1| + |2-2| + |-2-1| =$$
$$= 1+2+2.5+0+0+0+3 = 8.5$$

$$d_{Abs}(TS2, TS3) = |1+2| + |-1-3| + |-0.5-1| + |3-0| + |-1+1| + |2-2| + |1-3| =$$
$$= 3+4+1.5+3+0+0+2 = 13.5$$

$$d_{Abs}(TS1, TS3) = |0+2| + |1-3| + |2-1| + |3-0| + |-1+1| + |2-2| + |-2-3| =$$
$$= 2+2+1+3+0+0+5 = 13$$

Infinity distance:

$$d_{Inf}(TS1, TS2) = \max(0-1, 1+1, 2+0.5, 3-3, -1+1, 2-2, -2-1) =$$
$$= \max(1; 2; 2.5; 0; 0; 0; 3) = 3$$

$$d_{Inf}(TS2, TS3) = \max(1+2, -1+3, -0.5-1, 3-0, -1+1, 2-2, 1-3) =$$
$$= \max(3; 4; 1.5; 3; 0; 0; 2) = 4$$

$$d_{Inf}(TS1, TS3) = \max(0+2, 1-3, 2-1, 3-0, -1+1, 2-2, -2-3) =$$
$$= \max(2, 2, 1, 3, 0, 0, 5) = 5.$$