Ratings examples

In the table below, each row represents a user's ratings of movies: \checkmark (check) indicates the person liked the movie, \checkmark (x) that they didn't, and \bullet (dot) that they didn't rate it one way or another (neutral rating or didn't watch).

Per	son	Fyre	Frozen II	Picard	Ratings written as a 3-tuple
\overline{P}	1	Х	•	✓	(-1,0,1)
P	2	1	\checkmark	X	(1, 1, -1)
P	3	1	\checkmark	✓	(1,1,1)
P	4	•	X	✓	

Which of P_1 , P_2 , P_3 has movie preferences most similar to P_4 ?

One approach to answer this question: use **functions** to define distance between user preferences.

Define the following functions whose inputs are ordered pairs of 3-tuples each of whose components comes from the set $\{-1,0,1\}$

$$d_1((x_1, x_2, x_3), (y_1, y_2, y_3)) = \sum_{i=1}^{3} ((|x_i - y_i| + 1) \operatorname{\mathbf{div}} 2) d_2((x_1, x_2, x_3), (y_1, y_2, y_3)) = \sqrt{\sum_{i=1}^{3} (x_i - y_i)^2}$$

$d_1(P_4,P_1)$	$d_1(P_4, P_2)$	$d_1(P_4, P_3)$
$d_2(P_4, P_1)$	$d_2(P_4, P_2)$	$d_2(P_4, P_3)$

Extra example: A new movie is released, and P_1 and P_2 watch it before P_3 , and give it ratings; P_1 gives \checkmark and P_2 gives \checkmark . Should this movie be recommended to P_3 ? Why or why not?

Extra example: Define the new functions that would be used to compare the 4-tuples of ratings encoding movie preferences now that there are four movies in the database.