School of Computing and Information Systems
the University of Melbourne
COMP90049 Introduction to Machine Learning (Semester 1, 2023)

Week 4

1. What is optimisation? What is a "loss function"?

2. For the following dataset:

	apple	*ibm*	*lemon*	*sun*	CLASS
TRAINING INSTANCES					
A	4	0	1	1	FRUIT
B	5	0	5	2	FRUIT
C	2	5	0	0	COMPUTER
D	1	2	1	7	COMPUTER
TEST INSTANCES					
T1	2	0	3	1	?
T2	1	2	1	0	?

A. Using the **Euclidean distance** measure, classify the test instances using the 1-NN method.

B. Using the **Manhattan distance** measure, classify the test instances using the 3-NN method, for the three weightings we discussed in the lectures: *majority class*, *inverse distance*, *inverse linear distance*.

dA = 4
dB = 6
dC = 9
dD = 11

wC = (9 - 9) / (9 - 4) = 0

wF = (9 - 4) / (9 - 4) + (9 - 6) / (9 - 4) = 8 / 5

C. Can we do weighted k-NN using **cosine similarity**?

vector