MA103: Mathematical Modeling
Lesson 15: KNN 2

Lesson Objectives

1. Create visualizations of standardized data, including color-coding data by category when appropriate.
2. Explain the concept of the KNN algorithm.
3. Use standardized distances to find nearest neighbors.
4. Use KNN to make a prediction.

Admin Notes / Agenda

- Scavenger Hunt due now
- PSL 1 Feedback
- WPR I Office Hours TH 224 11 SEP 0730-0930 and 1400-1500
- PSL 2 due on Canvas 10 2359 September 2025

Warm-Up - By Hand: Calculate the distances and predict whether or not Candidate Buck will be admitted to a small liberal arts school in upstate New York, assuming the scores have already been standardized.

	SSAT	SGPA	Distance	Admitted
Billy	-0.218	0.577		Y
Sally	-0.873	-1.155		N
Jane	1.091	0.577		Y
Buck	0.436	0.716	-	

Identify the follow attributes of this problem:

- Explanatory variable
- Response variable
- Historical records
- Predictor record

In Excel - but Copy to Your Board: The average typing speed of a class is 59.7 wpm with a standard deviation of 23.9 wpm. The average reaction time of a class is 231.8 ms with a standard deviation of 31.9 ms. Predict whether student 1 with typing speed = 72 wpm and reaction time = 223 is classified as a gamer given $k = 3$.

Id	Typing Speed (wpm)	Reaction time (ms)	Video Games	Std. Typ	Std. RT	Distance to 1
2	65	242	Yes			
8	50	222	No			
9	50	228	Yes			
13	55	224	No			
14	56	246	No			
19	46	239	No			

Explain how you determined if studen 1 was a gamer or not:

Identify the follow attributes of this problem:

- Explanatory variable
- Response variable
- Historical records
- Predictor record