

1. Find the distance between objects 1 and 3 by using the formula provided on the slides. Notice that we have mixed type of attributes. (You can scan and submit your handwritten calculation) (25/20 points)

Euclidean distance:

Nominal (test-1):

A -> 1

B -> 2

C -> 3

Ordinal (test-2):

Excellent -> 3

Good -> 2

Fair -> 1

Object	Test-1 (nominal)	Test-2 (ordinal)	Test-3 (numeric)
1	1	3	45
2	2	1	22
3	3	2	64
4	1	3	28

$$D(1,3) = [(1-3)^2 + (3-2)^2 + (45-64)^2]^{1/2} = \mathbf{19.13}$$

3. $E = (\text{Row Total} * \text{Column Total}) / \text{Grand Total}$

	Passed (E)	Failed (E)	Total
Attended	$(31 * 33) / 54 = 18.94$	$(31 * 21) / 54 = 12.06$	31
Skipped	$(23 * 33) / 54 = 14.06$	$(23 * 21) / 54 = 8.94$	23
Total	31	21	54

$$\chi^2 = (25 - 18.94)^2 / 18.94 + (6 - 12.06)^2 / 12.06 + (8 - 14.06)^2 / 14.06 + (15 - 8.94)^2 / 8.94 =$$

$$\chi^2 = 11.71$$

Using a significance level of .05, and critical value for df = 1 from the chi-square table is 3.84. Since $\chi^2 > 3.84$, we reject the null hypothesis.

There is a statistically significant relationship between passing the class and attendance. Meaning passing the class is dependent on attendance.

