

We can manually calculate predicted income using ~~10%~~ K-Nearest Neighbors (KNN) algorithm with $K=3$ for the following data:

Age	Income
21	60
20	55
22	60
22	61
23	65
24	62
25	65
30	70
31	68
22	?

Note:
 Task 01: The objective is to implement the K-Nearest Neighbors (KNN) algorithm with $K=3$, use the this algorithm to predict the income value, with the given input value = 22.
 A final task: Generation spreadsheet for a provided dataset.
 • Use python programming to validate KNN calculations.
 • Additionally compare the predicted outcomes of the KNN algorithm with Linear Regression results.

for KNN with $K=3$ & age 22

1) calculation of Euclidean distance between age = 22 with other data points:

- Distance from (21, 60) = $(22-21)^2 = 1$
- " " (20, 55) = $(22-20)^2 = 4$
- " " (22, 60) = $(22-22)^2 = 0$
- " " (22, 61) = $(22-22)^2 = 0$
- " " (23, 65) = $(22-23)^2 = 1$
- " " (24, 62) = $(22-24)^2 = 4$
- " " (25, 65) = $(22-25)^2 = 9$
- " " (30, 70) = $(22-30)^2 = 64$
- " " (31, 68) = $(22-31)^2 = 81$

If we do according to the distance value: 0, 0, 1, 1, 1, 4, 9, 64, 81
 i.e., (22, 60), (22, 61), (21, 60), (23, 65), (24, 62), (25, 65), (30, 70), (31, 68)

Now we can select the $K=3$ nearest neighbors
 = (22, 60), (22, 61), (21, 60)

Average income of the selected neighbors = $\frac{60+61+60}{3} = 60.33$