The K-Nearest Neighbor (KNN) algorithm is a supervised learning algorithm aimed at performing classification or regression (such as decision trees). The principle is based on the concept of distance that we discussed during the segmentation. Indeed, it is a question of finding the closest neighbors of an observation with the explanatory variables and then assigning the most predominant class of the target variable. The K represents the number of neighbors of an observation that we need to use to assign the prediction.

Based on the data table shown BELOW, determine Alice's fidelity by analyzing the closest 6 women (K = 6) to her. To calculate the distance, use only the quantitative variables.

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| **Nom** | **Provenance** | **Nombre de produit** | **Age** | **Revenu** | **Sexe** | **Depense** | **Fidélité** |
| Louisa | Québec | 7 | 18 | 30000 | F | 154 | eleve |
| Annie-claire | Québec | 3 | 32 | 32745 | F | 678 | moyen |
| Francoise | Québec | 8 | 22 | 45854 | F | 1567 | eleve |
| Chantale | Québec | 4 | 18 | 48983 | F | 567 | moyen |
| Francois | Montréal | 5 | 36 | 54748 | H | 1457 | moyen |
| Jonathan | Montréal | 5 | 33 | 55759 | H | 2312 | moyen |
| Jeremy | Toronto | 11 | 27 | 43234 | H | 2456 | eleve |
| Axel | Toronto | 12 | 29 | 4398 | F | 165 | eleve |
| Kevin | Québec | 2 | 19 | 67493 | F | 1282 | faible |
| Thiago | Québec | 2 | 35 | 89498 | H | 738 | faible |
| Clara | Montréal | 3 | 39 | 44356 | F | 993 | faible |
| Bruno | Toronto | 5 | 42 | 54789 | H | 1923 | moyen |
| Pascal | Toronto | 1 | 29 | 93456 | H | 2129 | eleve |
| Abou | Montréal | 7 | 39 | 34678 | H | 1546 | moyen |
| Mohamed | Toronto | 7 | 33 | 75355 | H | 3987 | eleve |
| Michael | Toronto | 14 | 31 | 45000 | H | 4277 | eleve |
| Raphaelle | Montréal | 12 | 29 | 34453 | F | 2466 | eleve |
| Karine | Montréal | 12 | 18 | 65789 | F | 1055 | eleve |
| Sandra | Montréal | 5 | 26 | 89765 | F | 745 | moyen |
| Alice | Montréal | 4 | 26 | 50549 | F | 1028 | ? |
| Steve | Toronto | 5 | 31 | 47894 | H | 1283 | moyen |
| Fabien | Toronto | 4 | 33 | 39776 | H | 2213 | moyen |
| Ted | Québec | 3 | 27 | 43465 | H | 2419 | moyen |
| Victor | Québec | 2 | 40 | 17975 | H | 1836 | moyen |
| Julia | Montréal | 1 | 45 | 44356 | F | 4277 | faible |
| Bazia | Montréal | 1 | 18 | 54789 | F | 2466 | faible |
| Lucas | Toronto | 6 | 21 | 93456 | H | 1055 | faible |
| Thomas | Toronto | 7 | 30 | 34678 | H | 745 | faible |