

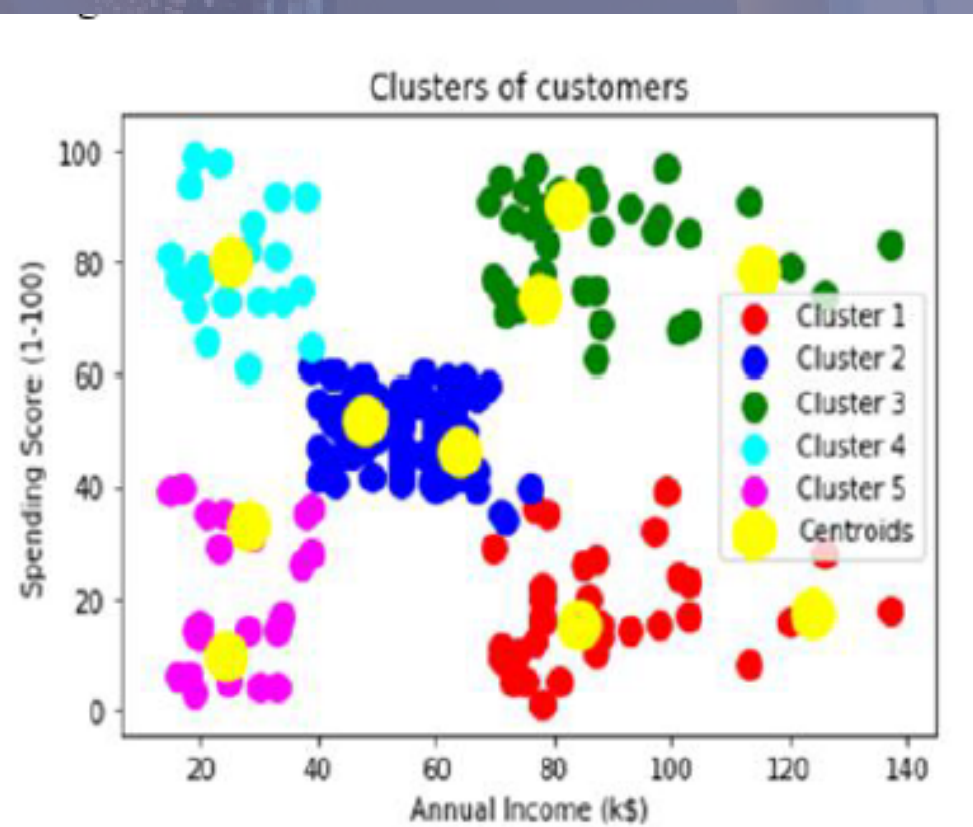
MALL CUSTOMER SEGMENTATION

K - MEANS CLUSTERING

K-Means clustering: Is a type of unsupervised learning, which is used when you have unlabeled data. The goal of this algorithm is to find groups in data, with the number groups represented by variable K.

Customer segmentation: Process of separating the customers visited to the Mall and it is a potent way of representing and defining the customer needs.

CLUSTERS OF CUSTOMERS



Customer segmentation Result:

Cluster 1 (Red) implies earning a lot while spending less.
Cluster 2 (blue) reflects the mean in terms of earnings and spending.
Cluster 3 (Green) shows both high earnings and significant spending.

[Prospective customers]

Cluster 4 (blue) denotes earning less but spending more.
Cluster 5 (magenta) denotes earning less and spending less.

Business Target:

Because of the intense rivalry in the business sector, businesses have had to improve their profitability and business throughout time by satisfying client requests and attracting new customers based on their wants.

Formulae

$$J = \sum_{i=1}^m \sum_{k=1}^K w_{ik} \|x^i - \mu_k\|^2$$



Data set:

| 1 | CustomerID | Gender | Age | Annual Inc | Spending Score |
|----|------------|--------|-----|------------|----------------|
| 2 | 1 | Male | 19 | 15 | 39 |
| 3 | 2 | Male | 21 | 15 | 81 |
| 4 | 3 | Female | 20 | 16 | 6 |
| 5 | 4 | Female | 23 | 16 | 77 |
| 6 | 5 | Female | 31 | 17 | 40 |
| 7 | 6 | Female | 22 | 17 | 76 |
| 8 | 7 | Female | 35 | 18 | 6 |
| 9 | 8 | Female | 23 | 18 | 94 |
| 10 | 9 | Male | 64 | 19 | 3 |
| 11 | 10 | Female | 30 | 19 | 72 |
| 12 | 11 | Male | 67 | 19 | 14 |
| 13 | 12 | Female | 35 | 19 | 99 |
| 14 | 13 | Female | 59 | 20 | 15 |

Conclusion

As a result of this massive data volume, consumer data is growing tremendously. These clustering models must be able to process this massive amount of data properly.