**Feature engineering** is the process of transforming raw data into features that better represent the underlying problem to the predictive models, resulting in improved model accuracy on unseen data.

* **feature extraction and feature engineering**: transformation of raw data into features suitable for modeling;
* **feature transformation**: transformation of data to improve the accuracy of the algorithm;
* **feature selection**: removing unnecessary features.
* Feature engineering is the process to extract features. It is an important pre-processing procedure, but not as important as the clustering algorithm. False

However, there exist cases where the algorithm will necessarily converge to the same solution. For instance, consider points equally distributed over a segment, in a 2-cluster problem. It is quite clear (although a bit harder to explain) that any initialization will eventually converge to the same solution (this need additional assumptions, such as no point being on the edge of both clusters, at least).

In your example case, with a more complex structure, the problem is more difficult to analyze. **There are some problems which will likely give the same results every time, other that will yield different results.** But anyway, you can't be sure, in the general case, that it will fall back to a single solution.

**Single linkage** is better at handling **non-elliptical** shapes than DBSCAN.

**Manhattan** may be appropriate if different dimensions are not comparable.

K-medoids method is more **robust** than k-mean in presence of noise and outliers because a medoids is less influenced by outliers or other extreme values than a mean

* Manhattan distance is more robust than Euclidean distance to handle noise. False
* The **centroid** is the arithmetic mean of all the points in the cluster. T

To find the centroid, one computes the (arithmetic) mean of the points' positions separately for each dimension.

* Clustering is used to partition objects into groups, such that objects from different groups are similar. True
* Customer segmentation is used to understand data. True
* Ordinal features can be transformed into numerical features. After the transformation, sorting operations on them tell some of the properties of the ordinal features. True
* There is more than one way to measure the performance of a clustering algorithm. True
* If we use {very sweet, sweet, not sweet} to describe the taste of an apple, we must use three numerical features to transform the taste feature into numerical. False ????
  + “taste” is an ordinal feature to describe three levels of
* We need to select one more parameter for DBSCAN than k-means. But DBSCAN cannot work well on all data, thus we do not know whether we benefit from the pain of selecting one more parameter considering the clustering performance. True ????
* A group of input variables together is called an attribute. False
* Manhattan distance is more robust than Euclidean distance to handle noise. True
* Features are used to describe the cluster in clustering technique. False
  + Features/attributes are used to describe the