Biclustering for precise patient stratification from clinical features

Dr. JOSÉ-GARCÍA

Assignment 2:

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Reading

[2] Amir Ahmad and Lipika Dey. *A k-means clustering algorithm for mixed numeric and categorical data* (continuation)

[4] To read about the Silhouette score sklearn and Wikipedia.

Part I: Experimentation with k-means

1. Considering your implementation of `k-means*` and the Iris dataset, run the algorithm 50 times. Measure the `accuracy` of the 50 clustering solutions generated by `k-means*` taking into account the `Iris true labels`.
2. Repete the experiment from **Step 1** using `sklearn.cluster.KMeans`.
3. Create a box plot comparing the accuracy performances of **Step 1** and **Step 2**.
4. Create a scatter plot to illustrate the best clustering solution (highest accuracy values) from the solutions generated in **Step 1**. Repeat the same procedure for creating a new scatter plot from the solution generated in **Step 2**.
5. To create a convergence plot of your `k-means*` implementation using the `Iris` dataset. The k-means minimizes the *within-cluster sum of squares* (WCSS). Thus plot at each iteration the WCSS value. The x-axis should indicate the number of iterations and the y-axis should indicate the WCSS value. Repeat this procedure 50 times, thus the plot will have 50 convergence lines.
6. Read about the digits dataset and then import it as:

```
from sklearn.datasets import load_digits
data, labels = load_digits(return_X_y=True)
```

7. Repeat Steps 1 to 5, using the `digits dataset` instead of the iris dataset.

Part II: Clustering on heterogeneous features

1. To create a GitHub repository for the Biclustering algorithm in Ref [2].
2. To create a flowchart of the algorithm described in Ref [2], Section 4: *k-Mean clustering for mixed data sets*.