Balanced K-Means Clustering on an Adiabatic Quantum Computer

Applied Quantum Machine Learning Project

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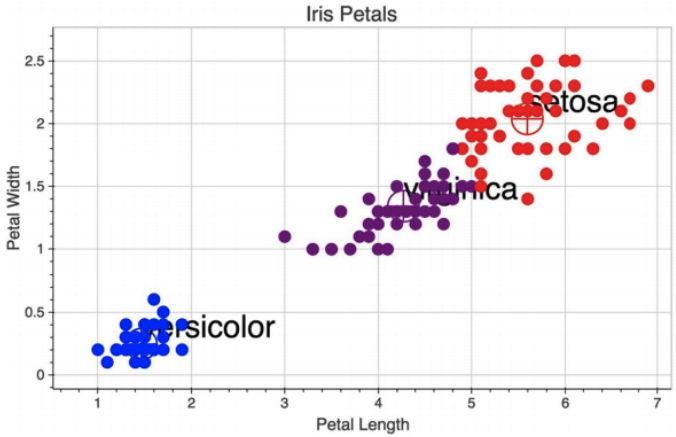
Outline

Advantages over classical approaches

- Better targets the global solution of the training problem
- Better theoretic scalability on large datasets



Outline

- QUBO formulation and theoretical analysis
- Empirical Analysis
- Conclusions and considerations

Lloyd's algorithm

- Complexity $O(Nkdi)$ [13]
  - N number of data points
  - k number of clusters
  - d dimension of the dataset
  - i number of iterations before the algorithm converges

Scikit-learn implementation

- Complexity $O(Nkd)$ [18]

[13] J. A. Hartigan and M. A. Wong, "Algorithm AS 136: A K-Means clustering algorithm" Applied Statistics

[18] "Scikit-learn: Machine learning in python," J. Mach. Learn. Res.

Thanks for your Attention