**Project mid-term report - Road Graphs**

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**Features to find**

**Random Graphs**

For random graphs, the choice of model is crucial to accurately simulate the characteristics of the graphs we are analyzing. Specifically, we need to focus on random graphs that are connected. In fact, we verified that even the road network of Italy is connected, which suggests that the major parts of the country are connected with the islands. This connectivity might be achieved through existing marine routes, such as those in the Messina Strait.

Additionally, the nodes in these graphs should only be connected if their real-world distance is within a reasonable range.

After conducting some research, we identified a few random graph models that may be useful for this task:

1. **The Watts-Strogatz Model**: This model generates graphs with small-world properties, which are particularly useful for representing networks where nodes are grouped closely together and connected to one another.
2. **The Random Geometric Graph**: In this model, N nodes are placed randomly in a metric space, following a specified probability distribution. Two nodes are connected by an edge if their distance is within a certain range, such as a specified neighborhood radius, r.

*References:*

https://chih-ling-hsu.github.io/2020/05/15/Graph-Models#watts-strogatz-model

https://en.wikipedia.org/wiki/Random\_geometric\_graph