

1. [2.5 points] Describe the principle of Dynamic Programming. Pick a problem of interest in Data Science which can be solved efficiently using Dynamic Programming. Describe the problem and the application of Dynamic Programming on it.
2. [2.5 points] Describe the main ingredients of local search. Pick a problem of interest in Data Science which can be solved efficiently using local search in a discrete space. Describe the problem and the application of local search on it. What happens if the search space is continuous?
3. [2.5 points] Describe the K-means clustering algorithm. Is it an Expectation-Maximization algorithm? Explain. What are some drawbacks of the K-means algorithm?
4. [2.5 points] Describe the FastMap algorithm. What does it achieve and how does it do so? Comment on its efficiency. Describe two applications of FastMap in Data Science.