Machine Learning 1 – Exercise 5

Machine Learning for Computer Vision
TU Dresden

1 Clustering

a) Show that it is sufficient in (7.1) of the lecture notes[1] to consider only chordless cycles.

b) How many chordless cycles are there in a complete graph with $n \in \mathbb{N}$ nodes?

c) Show: For the special case of complete graphs, the graph decomposition problem specializes to the set partition problem.

d) Define procedures for computing the following differences in cost efficiently:

i) $\varphi(y^{\text{join}_{BC}[\Pi]}) - \varphi(y^{\Pi})$, cf. Algorithm 4 in the lecture notes[2]

ii) $\varphi(y^{\text{move}_{aU}[\Pi]}) - \varphi(y^{\Pi})$, cf. Algorithm 5 in the lecture notes[2]

[1] `https://mlcv.inf.tu-dresden.de/courses/21-winter/ml1/ml1-lecture-notes.pdf`