MAT 542: Algebraic Topology, Fall 2016

Suggested Problems for Week 5

You may hand in solutions to at *most* 2 problems every 2 weeks and no later than 2 weeks after the necessary material for them is covered in class.

From Munkres: 15.1, 15.2, 17.1-3, 18.1-3

Problem I

Let K be a simplicial complex of dimension n (the maximal dimension of the simplicies) and K^m be its m-th skeleton (the union of all simplicies of dimension at most m). Show that $K - K^m$ is a union of open subsets $U_{m+1}, \ldots, U_n$ such that all possible intersections

$$U_{i_1} \cap \ldots \cap U_{i_k} \subset K, \qquad i_1, \ldots, i_k \in \{m+1, \ldots, n\}, \ k \in \mathbb{Z}^+,$$

are disjoint unions of contractible open subsets of K.