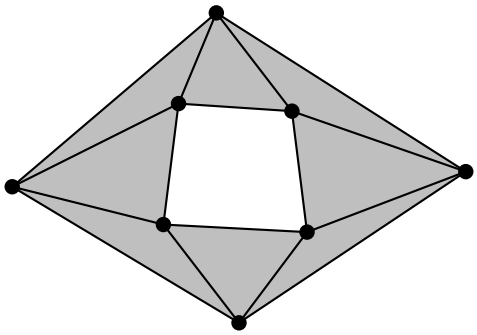
Computing Simplicial Homology

MATH 348

Consider the following simplicial complex K.



1. Write down matrices representing the boundary maps δ_1 and δ_2 for K.

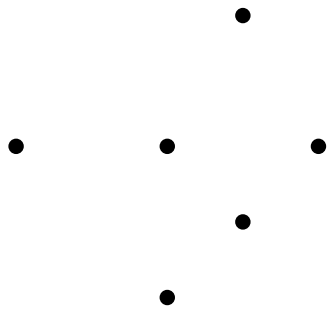
2. Reduce your matrices by left-to-right column additions using arithmetic mod 2.

3. Compute $\dim H_0(K)$ and $\dim H_1(K)$.

Simplicial Complexes from Data

MATH 348

1. Consider the following point cloud in $\mathbb{R}^2$. For some $\epsilon > 0$ of your choice, construct the simplicial complexes $VR_\epsilon(Q)$ and $\check{C}_\delta(Q)$.



2. Let Q be a set of points in $\mathbb{R}^n$.

(a) For what parameters ϵ and δ is $VR_\epsilon(Q)$ a subcomplex of $\check{C}_\delta(Q)$?

(b) For what parameters ϵ and δ is $\check{C}_\delta(Q)$ a subcomplex of $VR_\epsilon(Q)$?