Compute the barcodes of your filtrations using your code, and check the validity of your results against the results obtained by hand in the previous exercise session.

For a given topological space X, by H* we express the supplementary sum of its various homology groups $H_i(X,k)$

$$H^* = \bigoplus_{0 \le i \le \dim(X)} H_i(X,i)$$

Remark, if the last spaces are nulls, we will simply omit to represent them.

Now let's use the barcodes obtained by the algorithm in order to compute some homology groups already calculated in PC. We work here in $\mathbb{K} = Z_2$.

To do so, we have to focus on the intervals that finish at infinity in the generated barcodes.

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ball4.txt

0 1.0 inf

$$H^* = \mathbb{K} \oplus 0 \oplus 0 \oplus 0$$

sphere4.txt

0 1.0 inf
4 5.0 inf

$$H^* = \mathbb{K} \oplus 0 \oplus 0 \oplus 0 \oplus \mathbb{K}$$

klein-bottle.txt

0 2.0 inf
1 4.0 inf
1 8.0 inf
2 13.0 inf

$$H^* = \mathbb{K} \oplus \mathbb{K}^2 \oplus \mathbb{K}$$

mobius-strip.txt:

0 2.0 inf
1 5.0 inf

$$H^* = \mathbb{K} \oplus \mathbb{K}$$

projective-plane.txt:

0 2.0 inf
1 8.0 inf
2 13.0 inf

$$H^* = \mathbb{K} \oplus \mathbb{K} \oplus \mathbb{K}$$

torus.txt

0 2.0 inf
1 4.0 inf
1 11.0 inf
2 13.0 inf

$$H^* = \mathbb{K} \oplus \mathbb{K}^2 \oplus \mathbb{K}$$