Algebraic Topology – Homework 9

Due date : December 17th in class

Exercise 1.

Let X^1 be the wedge of two circles $S^1 \vee S^1$, where one circle is labeled by a, and one by b.

(i) Let X be the two-dimensional CW complex obtained by attaching a 2-cell to X^1, where the attaching map is $ab^2a^2b^2a^{-1}b^{-1}$. Compute the (cellular) homology of X.

(ii) Let Y be the two dimensional CW complex obtained by attaching two 2-cells to X^1, with attaching maps respectively given by a^5b^{-3} and $b^3(ab)^{-2}$. Compute the (cellular) homology of Y. Is Y contractible ?

Exercise 2.

Exercise number 16 on page 156 of Hatcher's book.

Exercise 3.

Exercise number 31 on page 158 of Hatcher's book.

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Given a topological space X, the **suspension** $S\,X$ of X is defined to be the topological space obtained from $X \times [0,1]$ by collapsing $X \times \{0\}$ to a point, and $X \times \{1\}$ to another point.

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Exercise 4.

Exercise number 32 on page 158 of Hatcher's book.
What is the suspension of the n-dimensional sphere S^n ? Use exercise 32 to compute (again) the reduced homology groups of S^n.