

- (0) If $\{X_i\}_{i=0}^n$ have non-degenerate base points, show $\tilde{H}_k(\vee X_i) \cong \oplus \tilde{H}_k(X_i)$
- (1) Prove by induction on the dimension the following facts about the homology of a finite dimensional CW complex X , using the observation that X^n/X^{n-1} is a wedge of n -spheres:
 - (a) If X has dimension n then $H_i(X) = 0$ if $i > n$ and $H_n(X)$ is free.
 - (b) $H_n(X)$ is free with basis in bijective correspondence with the n -cells if there are no cells of dimension $n - 1$ or $n + 1$.
 - (c) if X has k n -cells then $H_n(X)$ is generated by at most k elements.
- (2) (a) Give the 2-holed torus a Δ -complex structure.
- (b) Compute its simplicial homology.