(1) Compute the homology groups of the torus $S^1 \times S^1$.
(2) The **suspension** of a space X, denoted SX, is $X \times I/\sim$ where $(x,1) \sim (x',1)$ and $(x,0) \sim (x',0)$ for all $x, x' \in X$.
    Prove that $\tilde{H}_{n+1}(SX) \cong \tilde{H}_n(X)$.
(3) Compute the homology groups $H_n(X, A)$ when X is S^2 or $S^1 \times S^1$ and A is a finite set of points.
(4) (a) Show that the quotient map $S^1 \times S^1 \to S^2$ collapsing the subspace $S^1 \vee S^1$ to a point is not nullhomotopic by showing that it induces an isomorphism on H_2.
    (b) Show via covering spaces that any map $S^2 \to S^1 \times S^1$ is nullhomotopic.