Math 751 - Topics in Topology
Homework 1
Spring 2015

1. Using the notion of simplicial homotopy described in Definition 8.6 of Friedman, show that when G is a topological group then the identity map of $E_\bullet G$ is homotopic to the constant map at the identity element $e \in E_0 G = G$.

2. If $K_\bullet$ is a simplicial space, by the **simplicial n-skeleton**, we mean the realization using only K_i, where $i \leq n$. Show that the simplicial 1-skeleton of BG is the (reduced) suspension ΣG, where the identity element $e \in G$ serves as basepoint.

3. Consider the Δ-interval Δ^1_Δ. Show that the natural map $|\Delta^1_\Delta \times \Delta^1_\Delta|_\Delta \longrightarrow |\Delta^1_\Delta|_\Delta \times |\Delta^1_\Delta|_\Delta$ is not a homeomorphism.