Quiz 9 — March 30, 2011 – Section 3 – 8:00-8:50 recitation.

Does the series $\sum_{n=2}^{\infty} \frac{1+\sin n}{10^n}$ converge? **Justify your answer very thoroughly. Use complete sentences.**

We compare $\sum_{n=2}^{\infty} \frac{1+\sin n}{10^n}$ to $\sum_{n=2}^{\infty} \frac{2}{10^n}$. We know that $\sum_{n=2}^{\infty} \frac{2}{10^n}$ is a geometric series with ratio $\frac{1}{10}$. This ratio is between -1 and 1. Thus, $\sum_{n=2}^{\infty} \frac{2}{10^n}$ converges. We see that $0 \leq \frac{1+\sin n}{10^n} \leq \frac{2}{10^n}$. The comparison test yields that $\sum_{n=2}^{\infty} \frac{1+\sin n}{10^n}$ also converges.