Graded:

**Problem 1:** Consider a large plate with an edge crack of initial length 0.1 in. The plate is made of material with Paris model parameters $C = 7 \times 10^{-10}$ and $n = 4$. Calculate the crack length after a deformation history that consists of 2000 cycles with $\sigma_{\text{max}} = 20\text{ksi}$ and $\sigma_{\text{min}} = 0\text{ksi}$, followed by 2000 cycles with $\sigma_{\text{max}} = 10\text{ksi}$ and $\sigma_{\text{min}} = 0\text{ksi}$.

Ungraded:

**Problem 2:** Consider a thin ribbon of steel that is 1 inch wide and 0.05 in thick, with yield stress equal to 200 ksi, $K_{\text{IC}} = 100\text{ksi}\sqrt{\text{in}}$ and perfectly plastic post-elastic response. Imagine that the ribbon has a crack at its edge. Using expressions for the stress intensity factor at the tip of an edge crack in a finite width plate generate a plot of the strength of the ribbon versus crack length. Consider both fracture and net section yield in generating your plot. That is, assume the ribbon strength is the minimum of the stress needed to cause yield of the remaining section at the crack or propagation of the crack.