Nuclear Engineering 150 – Discussion Section
Team Exercises #3

Problem 1

A reactor is operating for a long time at some known power density P_0. Then, it instantaneously changes power to some power density P_1. One fission product of interest is ^{135}Xe, though it has a neglible yield from the initial fission reaction. ^{135}Xe precursors ^{135}Te and ^{135}I are produced with a combined yield of approximately 6%, before decaying via β^- decay to ^{135}I and ^{135}Xe respectively. Find the number density of ^{135}Xe as a function of time after the power change. (Your solution may be left as variables)

Nucleus	Half-life	Thermal σ_a
^{135}Te	19.0 s	~ 0
^{135}I	6.6 hr	~ 0
^{135}Xe	9.2 hr	2.6×10^6 barns

Problem 2

Text of problem 2