Question 1 [25 marks]:
   a) Using Athena approximate the thickness of a SiO$_2$ layer grown using a wet process for 2 hours at 1000°C? The wafer should be 111-terminated, boron-doped silicon, with a resistivity of 10 Ωcm. Please include code and an image from TonyPlot in your answer. [5 marks]
   b) Use Athina to determine a set of steps one can take to generate a vertical npn-structure from an intrinsic (undoped) wafer. I.e. generate a wafer that is n-doped at the surface of the wafer, p-doped below that, and n-doped below that. You just need to generate the vertical doping profile; you do not need to worry about making electrical contact etc. Note: there will be some overlap between n- and p-regions, you just need to make sure each region has the expected majority carrier. The thickness of the respective layers does not matter as long as they are distinct. Please include code and an image from TonyPlot in your answer. [10 marks]
   c) We wish to dope a region of a wafer with phosphorus. Use Athena to simulate local doping of a 10 μm wide region in the center of a wafer. The doping concentration is not important, but there should be no residual oxide / masking material left on the wafer. A small amount of unintentional doping is acceptable in adjacent regions. Please include code and an image from TonyPlot showing concentration as a function of position in your answer [10 marks]