**Procedure: -**

For the purpose of this project the setup used was a one-dimensional, isotropic, linear material rod of length 1m with the top part fixed to the top surface with a gap distance of 0.001m from the bottom surface. The top and bottom surfaces were assumed to be held at constant temperatures. With the top surface held at a temperature of 2160 C while the bottom surface was maintained at a constant temperature of 00C. Also, convection was not considered in this case.

The variables in our setup were the temperature distribution, pressure distribution and the change in length of the rod or displacement. For finding these three variables we used three differential equations namely the 1-D Conduction equation to find the temperature distribution, the Lame-Navier equation to find the displacement and the Hookes law to find the stress developed in the body. The nondimensionalization was done to make it easier to solve for various materials and different setups. The boundary conditions were assumed such that the nondimensionalized variable of temperature was 1 at the top and zero at the bottom. These differential equations were solved for analytical and numerically in matlab. They were solved for the following cases: - 1) Steady state out of contact, 2) Steady state in contact (for these two cases a range of values for R (Thermal contact resistance) (0-1) were assumed), 3) Transient in contact, 4) Transient out of contact (For these two cases R was not considered to make the calculations simpler).

The rod was assumed to be made of stainless steel with linear thermal expansion coefficient (α) = 11.75\*10-6, Youngs Modulus (Y) = 200Gpa, and thermal conductivity (k) = 19 W/m·K.

A simple ansys simulation also was conducted with the above-mentioned parameters.