Step 1:

The functions **ON_state.m, OFF_state.m** is having the corresponding A matrix and B matrix information of a non-inverting buck-boost converter. In these functions, I am creating a vector(x_dot) of length 2 which will have i_L and v_C information.

Step 2:

From the open loop code named **COT_ode.m**, I am trying to solve the on state differential equation with ode45 solver for the interval nT to nT+T_on where the value of n is being incremented inside a for loop. The solution is then stored in an augmented vector and for each time instant the corresponding value of inductor current (capacitor voltage) is plotted in figure1(figure 2). Similarly, for off state the time duration is changed to from nT+T_on to (n+1)T and corresponding plotting is done. x_on_initial I am providing manually for the first run but for the off state solving the last value x_on is being passed to x_off_initial for the next stage of running and similarly for x_on_initial for the next run.

Step 3:

In the file parameters.m, all the necessary circuit parameters C, L, ESR, DCR, switching frequency, duty ratio, reference voltage is mentioned and during the beginning of COT_ode, ON_state, OFF_state each time parameters.m is run.