Write a program to find equilibrium temperature for rich mixtures considering species composition to be CO_2, CO, H_2O, H_2, N_2

- Read number of moles of the reactants
  - Fuel as well as air
  - Use CH_4, C_3H_8 as standard fuel
  - Refer specific heats, enthalpy and internal energy values from curve fit coefficients of polynomial given in the appendix for these species with complete combustion products as well
  - Vary equivalence ratio from 1.1 to 2.0 in steps of 0.05 to generate results
- Use water gas shift reaction along with 1^{st} law
  - Hprod = Hreac for isobaric & Uprod = Ureac for isochoric
- Generate Adiabatic temperature Vs Equivalence ratio plot as well as other species concentration plots

Calculate the adiabatic flame temperature using complete combustion products alone for constant pressure and constant volume combustion.

- Read number of moles of the reactants
  - Fuel as well as air
  - Use CH4, H2, C3H8 as standard fuel
  - Refer specific heats, enthalpy and internal energy values from curve fit coefficients of polynomial given in the appendix for these species with complete combustion products as well
  - Vary equivalence ratio from 0.5 to 2.0 in steps of 0.05 to generate results
- Find out what fraction of fuel can be completely burnt
- Apply conservation of energy principle (1^{st} law)
  - Hprod = Hreac
  - Uprod = Ureac
- Generate Adiabatic temperature Vs Equivalence ratio plot as well as other species concentration plots

Explain your results and variations with respect to chemical composition of fuel and equivalence ratio