VERY LOW MASS

This test is to show how `MESA` can handle stars with very low mass. If everything ran successfully, the run should be cut off when the star's age reaches 10 Gyr (`max_age = 10d9`).

This test case loads a pre-saved model of a 0.001 $M_\odot$ brown dwarf. The brown dwarf stays fully convective throughout the entire evolution, and, therefore, the abundances of the elements (figure 1), given in log mass fraction, are constant in q, where q is the fraction of star mass interior to outer boundary of each zone, moving outward fromt the core.

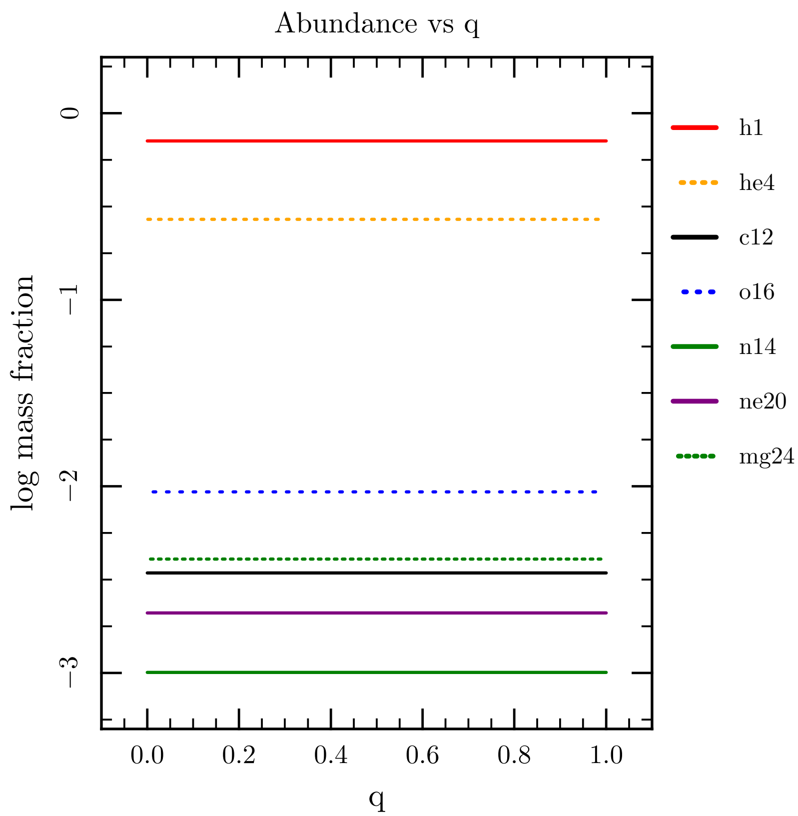

Figure 1: Abundance profile

The effective temperature (figure 2) and radius evolution (figure 3) are shown in the two plots below.

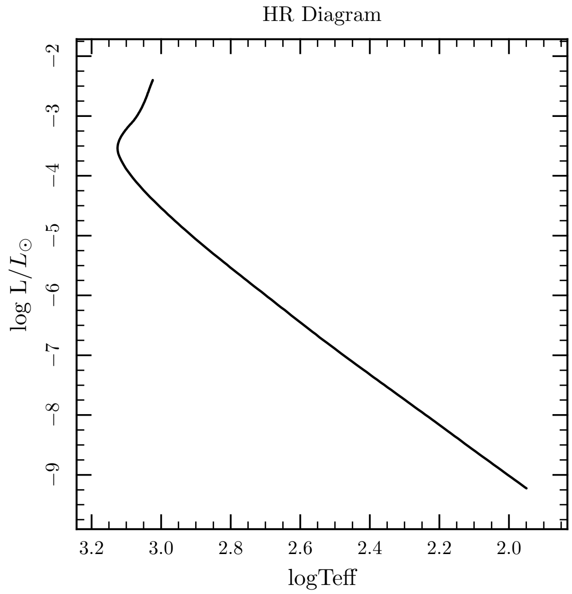

Figure 2: HR-diagram where the evolution track goes from top to bottom

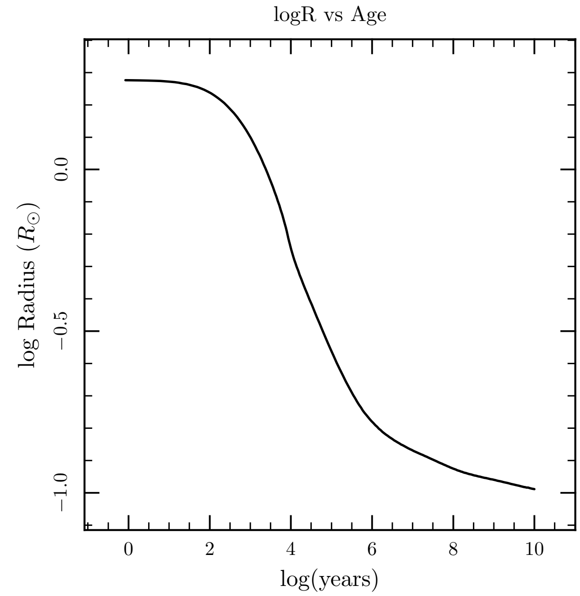

Figure 3: Gravitational potential energy is released as the star contracts, leading to slight rise in effective temperature

This next plot to the left (figure 4) similarly shows effective temperature behavior, but against log[g], and a profile of temperature vs. density at a few diffent ages (figure 5).

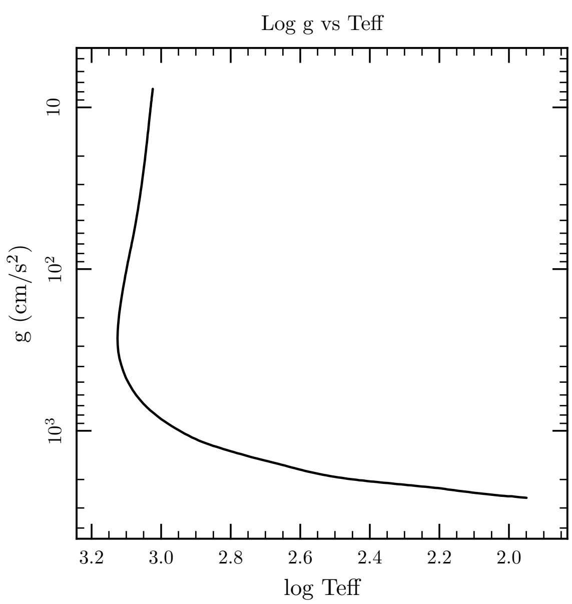

Figure 4: Log g vs. effective T where the evolution track goes from top to bottom

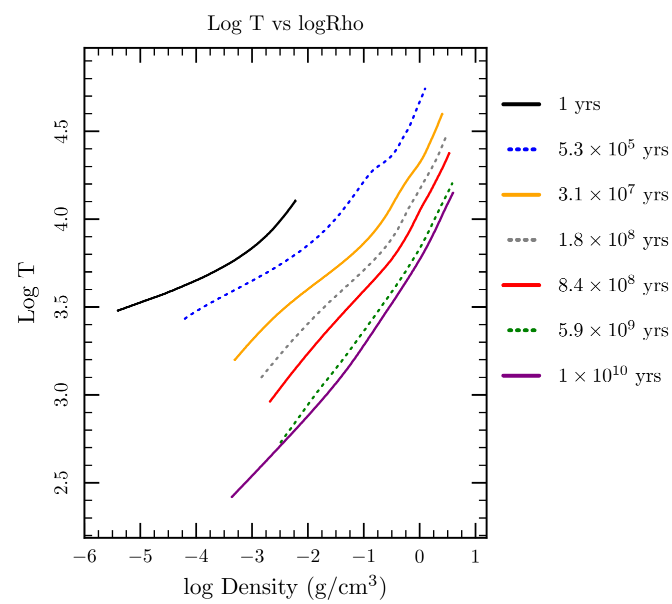

Figure 5: Temperature vs. density profile at a few ages show increase in density and temporary bump in temperature

This final plot (figure 6) shows a few internal `MESA` variables, such as the size of the time-step, the number of zones, and the number of retries against the model number in order to give some understanding of how hard `MESA` is working throughout the run and where some areas of problems/interest might be.

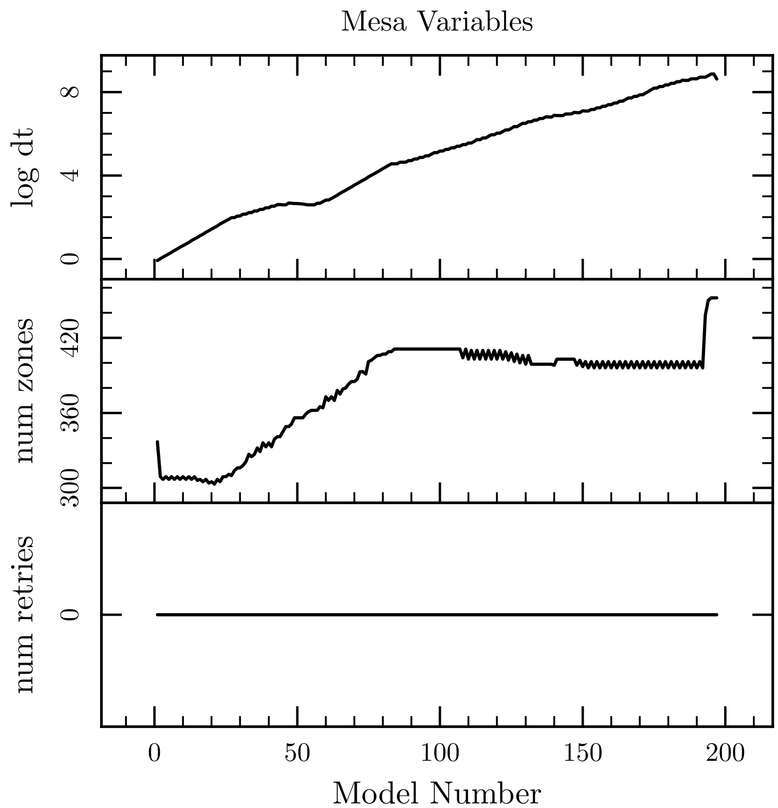

Figure 6: `MESA` variables plotted against model number show how hard `MESA` is working