Data Structures

This project utilizes three different types of data structures: lists, associations, and interpolating functions.

# Lists

Lists allow for storage of data and can be quickly accessed. Import has an option that allows for the data to be imported in the form of a nested list (each data point is a sublist) called “Table” which we use in our initialization function.

# Associations

Our initialization function takes a file from our dataset and imports it as a nested list (explained above). From there, it takes that list and separates each column into one dimensional lists (effectively separating each data point by quantity). Those lists are then given associations to string values so that we don’t have to worry as much about indexes. The associated lists are still organized by row also, this is really just an easier way to access the data using the same system as seen above.

# Interpolations

Once we have associations, we take each quantity and use our connect function to pair it one-to-one with the quantity “age”, effectively creating a list of coordinates. From, there, we can use Mathematica’s built in commands to interpolate it. An interpolating function is a compilation of functions (in our case linear ones) that are meshed together in such a way that values may be returned based on an input (just like any other function). This allows for us to functionalize the data from the dataset in a fully continuous manner, which is perfect for our project. This is the end-state of our data.