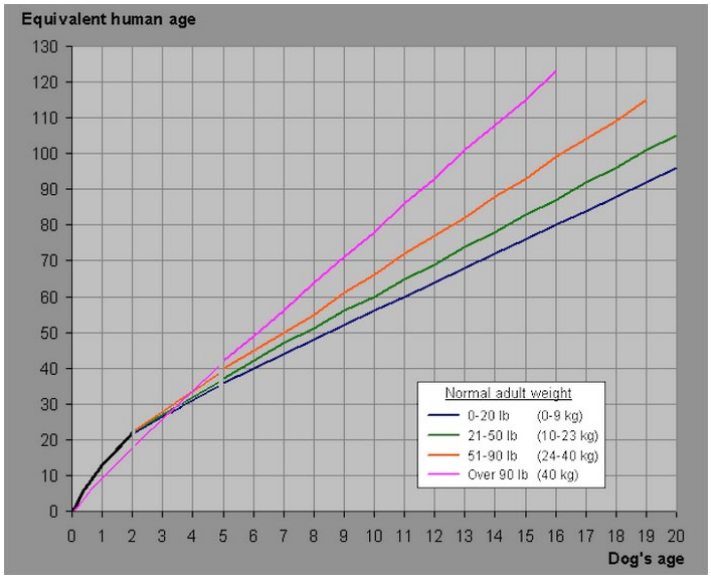
Modeling HW 2: Cat and Dog Ages

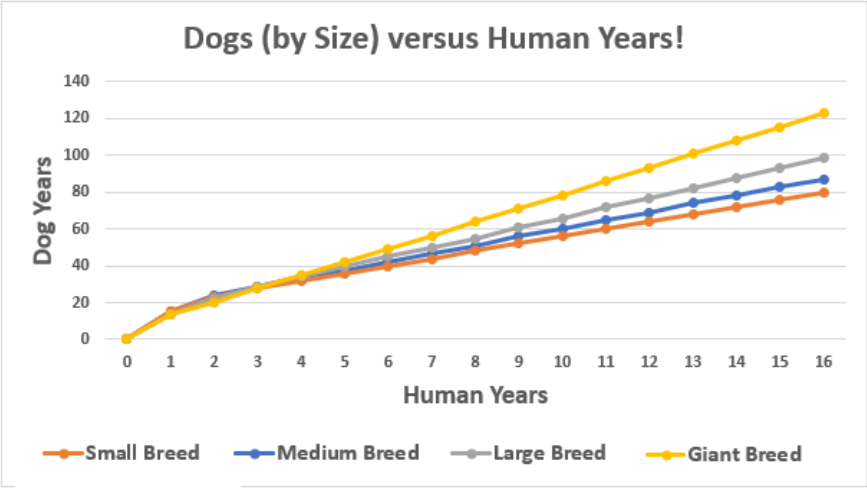
In this homework, you'll continue to explore the ideas of "cat years" and "dog years" we examined in the class notes.

Remember the LeBeau aging formula for cats and dogs? Probably not exactly, but that's fine. Almost immediately after it was published, people began to refine it. For example, some veterinary scientists started believing that larger dogs "aged" "more quickly" later in life than smaller dogs (cats apparently all cats age "the same").[1]

There is an interesting website that breaks down dog ages (https://priceonomics.com/the-mythology-of-dog-years/). Here's a graph that's on that page:

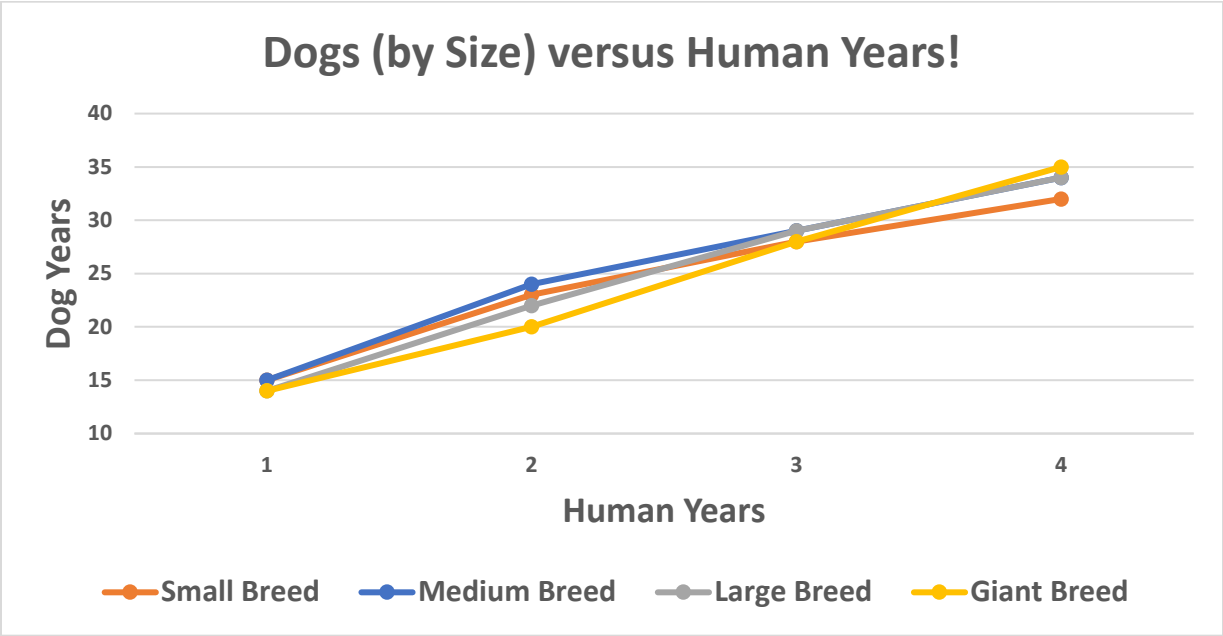


Now, you may not have noticed, but that graph reverses "dog years" and "human years" from the way we've been talking about them. That's fixed here!



Hmmmm…there seem to be some interesting things happening between years 1 and 4. Let's zoom in on that!

[1] All those quote marks are just to drive home the point that, in human years, a 10-year-old Chihuahua is just as "old" as a 10-year-old mastiff. However, in developmental years (i.e., "dog years"), vets thought there was enough variation to measure a difference.

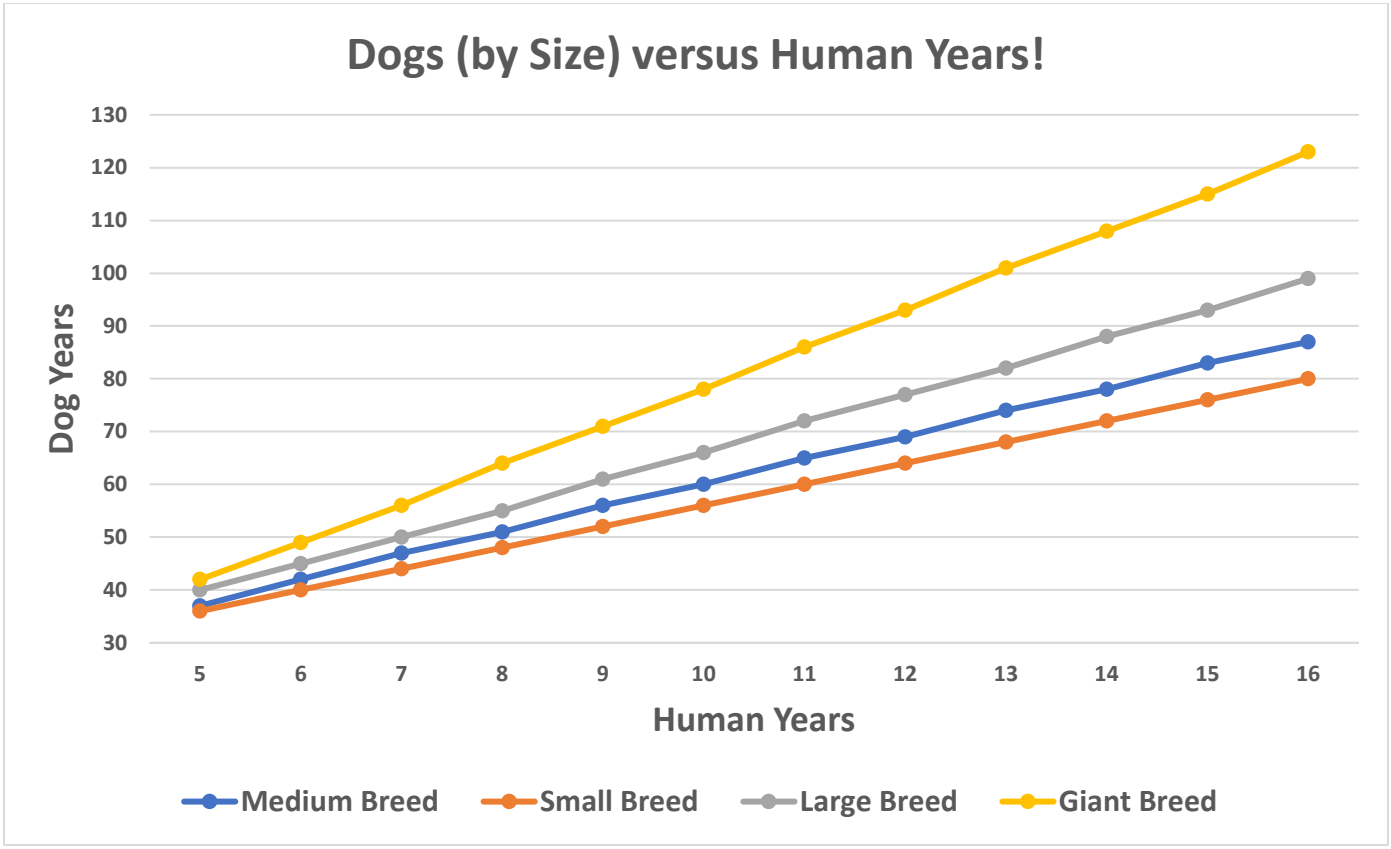


1. **(1 point)** At one year of human age, which sizes of breeds are the "youngest" in dog years? Choose **all** that apply:

2. **(1 point)** At two years of human age, rank the sizes of breeds from 1 (youngest) to 4 (oldest).

3. **(1 point)** Between two and four years of human age, something interesting happens to the comparative dog ages. What is it?

So, in the first 4 years of a dog's life, there was quite a bit of variability in the dog's ages, year-to-year. After that, their ages increase fairly linearly. Below, I've re-graphed the data focusing only on the years where the aging is happening most consistently year-to-year:



Those look like pretty straight lines, so let's find their slopes!

4. **(5 points) (w)** Find the slope of each size's "dog age" line. Write it as a single number (round if you need to). Make sure to include units on your slopes. Also make sure you show how you do it. You'll likely need to do some estimating based on the graph.

5. **(1 point)** About how many times "older" is a 12-year Great Dane (a giant breed) than a 12-year-old Pug (small breed)?