Module 1A Questions*

1. Calculate the mean, mode, and median, and standard deviation from the Weight12, and Activity columns.
2. What does it mean if the mean, mode, and median are approximately the same? What does it mean if they are different?
3. Can the standard deviation ever be zero? If so, when would that situation occur?

- I failed to upload the Base Mouse Dataset to Biostatistics I prior to the start date. I have now added it to the Datasets section for Biostatistics I, but here it is as well!

Base Mouse Dataset

We consider 12 mice from **three strains** (B6, BALB, CAST) on **two diets** (Chow vs High-fat diet, HFD). For each mouse we record initial and 12-week weight, 12-week fasting glucose, activity score, and expression of **two genes** (Pparg and Il6). Hyperglycemia is defined as Glucose12 ≥ 140 mg/dL. The following are simulated, but plausible measurements:

- **Weight0 / Weight12**: HFD animals gain more weight than Chow across strains.
- **Glucose12**: HFD animals have higher glucose than Chow across strains.
- **Activity**: Chow are generally less active than HFD in this toy experiment (you can blame enriched housing or running wheels for HFD if you want to justify it in words).
- **Pparg**: higher with more weight gain.
- **Il6**: higher with higher glucose (inflammation-ish).
- **Hyperglycemia**: based on a relatively high glucose threshold; mostly HFD, one CAST HFD "protected" to keep some heterogeneity

ID	Strain	Diet	Sex	Weight0	Weight12	Glucsoe12	Activity	Pparg	I16	Hyperglycemia
M1	B6	Chow	M	20	22	118	3.0	6	4	No
M2	B6	Chow	F	19	21	116	3.5	6	4	No
M3	B6	HFD	M	20	27	162	6.0	8	7	Yes
M4	B6	HFD	F	19	26	160	6.5	8	7	Yes
M5	BALB	Chow	M	19	21	114	4.0	6	4	No
M6	BALB	Chow	F	18	20	112	4.5	6	3	No
M7	BALB	HFD	M	19	25	158	7.0	7	7	Yes
M8	BALB	HFD	F	18	24	156	7.5	7	6	Yes
M9	CAST	Chow	M	18	20	110	5.0	6	3	No
M10	CAST	Chow	F	17	19	108	5.5	6	3	No
M11	CAST	HFD	M	18	24	154	8.0	7	6	No
M12	CAST	HFD	F	17	23	152	8.5	7	6	No