For today's class example would you prefer:

Data about penguins.

0%

Data about popular music on Spotify this year.

0%

Data about cellphones and their pricing.

0%

I have no preference.

0%

Wednesday, September 13

Lessons 001 and 002

Observational Studies versus Designed Experiments

- Observational studies refer to any statistical study which do **not** involve direct manipulation.

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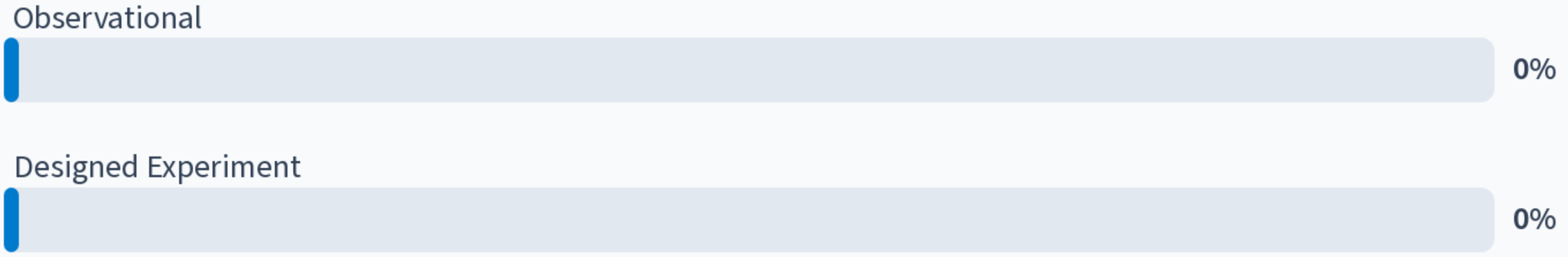
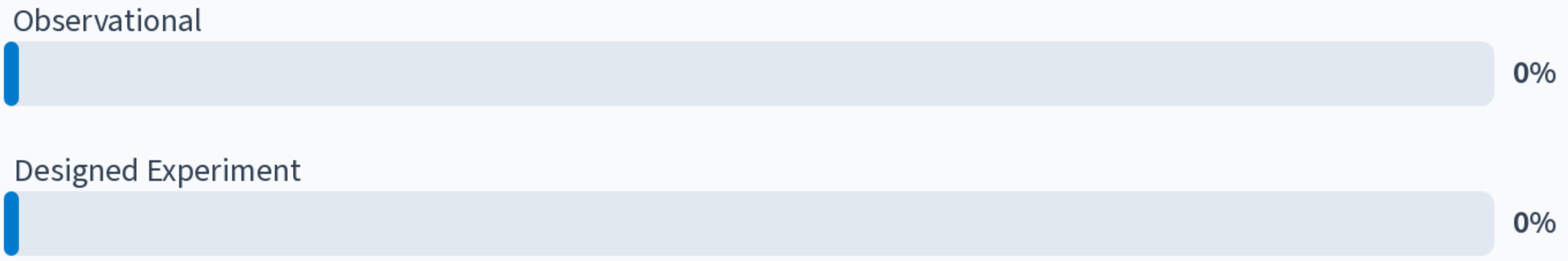
2. In an engineering research project, engineers observe the structural behavior of different materials while varying temperature conditions.
   - Designed experiment. There is direct intervention.
3. Researchers collect data on the smoking habits of individuals and their lung cancer incidence over a 10-year period.
   - Observational study. There is no direct intervention.

What type of study is described: A study examines the impact of social media advertising on consumer purchasing behavior by randomly assigning participants to view different ads and measuring their subsequent purchases.



What type of study is described: A psychology study observes and records the behavior of children during free playtime at a daycare center to assess social interactions.



A Note on Probability

- **Probability** represents the opposite process of statistics.

- You assume that you know something about a population and then ask what is expected to be observed in samples.

Summary

- Statistics is the process of using data to make inferences about a population from a sample.
- Parameters represent population quantities of interests, statistics represent sample quantities of interest.
- Variables can be quantitative or categorical, discrete or continuous.
- Statistics can be used to describe, infer, predict, or prescribe.
- Studies in statistics are either observational or experimental.
- Probability performs the opposite process of statistics

Pictorial Methods in Statistics

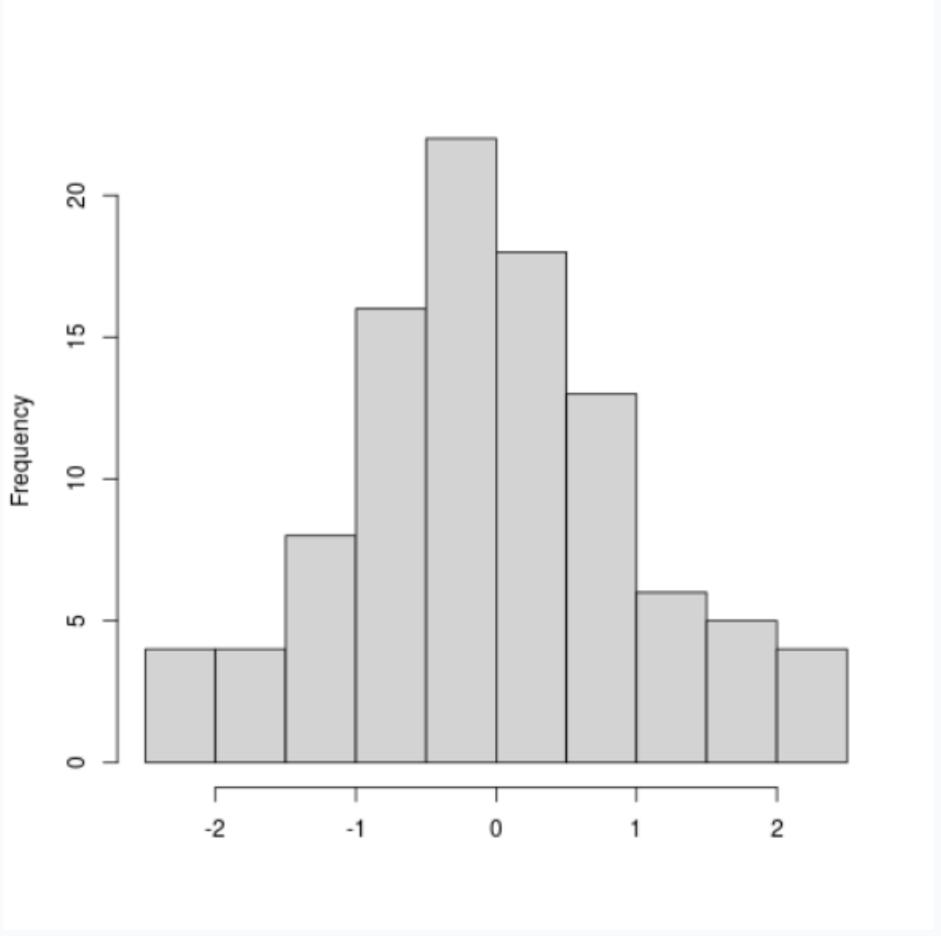
Survey Responses

Survey #2:

- **Note**: small error in Lesson 002 slides - corrected on D2L now.
- Explain stem-and-leaf plots more.
- Explain outliers more.
  - "Describe why this might be the case for notable outliers"
- Explain left and right skewed distributions.
- Q12.7, Q12.8, Q13.7
  - Describe the dataset from graphical displays;
  - Understanding stem-and-leaf plots.

Live Demo

Distribution 1



Symmetric, unimodal, without outliers. 0%

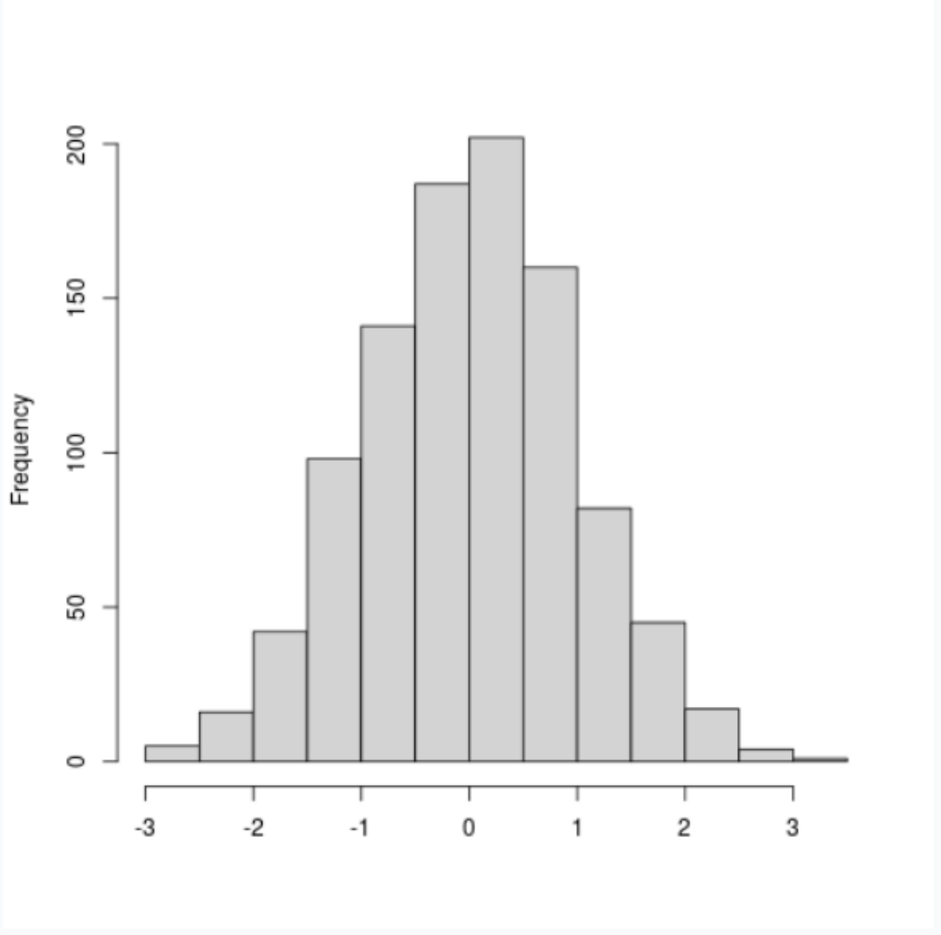
Left-skewed, unimodal, without outliers. 0%

Right-skewed, unimodal, without outliers. 0%

Symmetric, multimodal, with outliers. 0%

None of the above 0%

Distribution 2



Symmetric, unimodal, without outliers. 0%

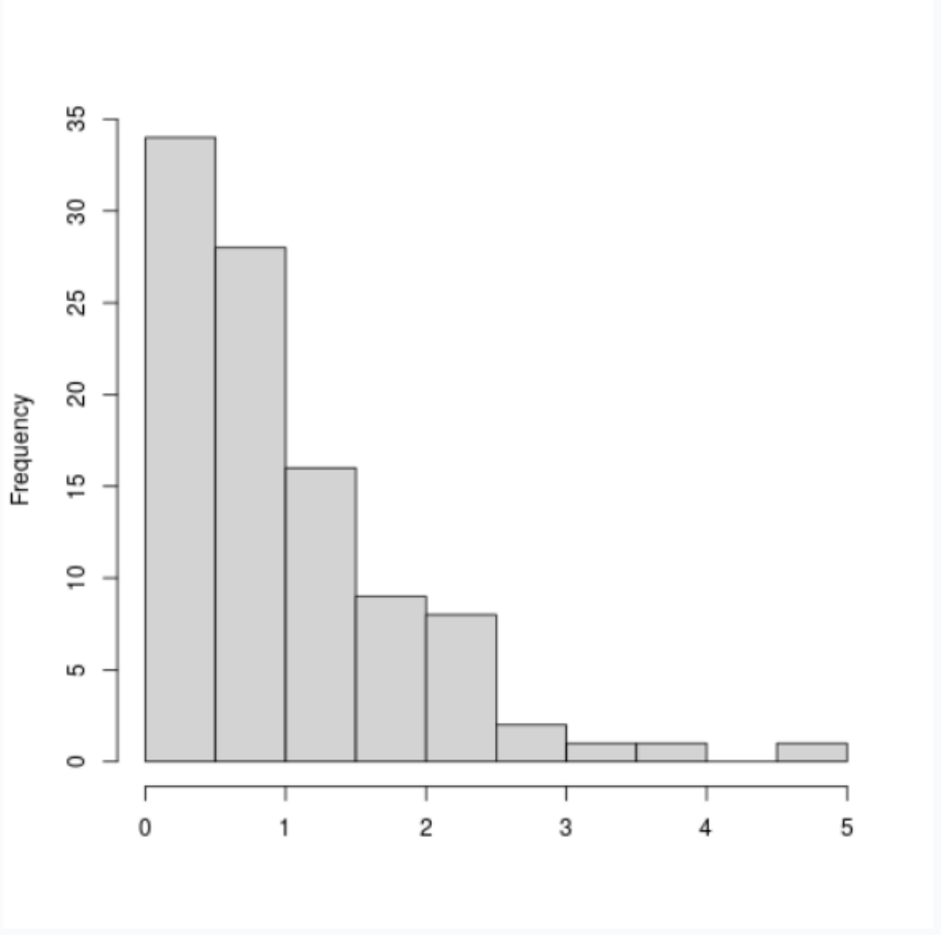
Left-skewed, unimodal, without outliers. 0%

Right-skewed, unimodal, without outliers. 0%

Symmetric, multimodal, with outliers. 0%

None of the above 0%

Distribution 3



Left-skewed, unimodal, without outliers

0%

Right-skewed, bimodal, without outliers

0%

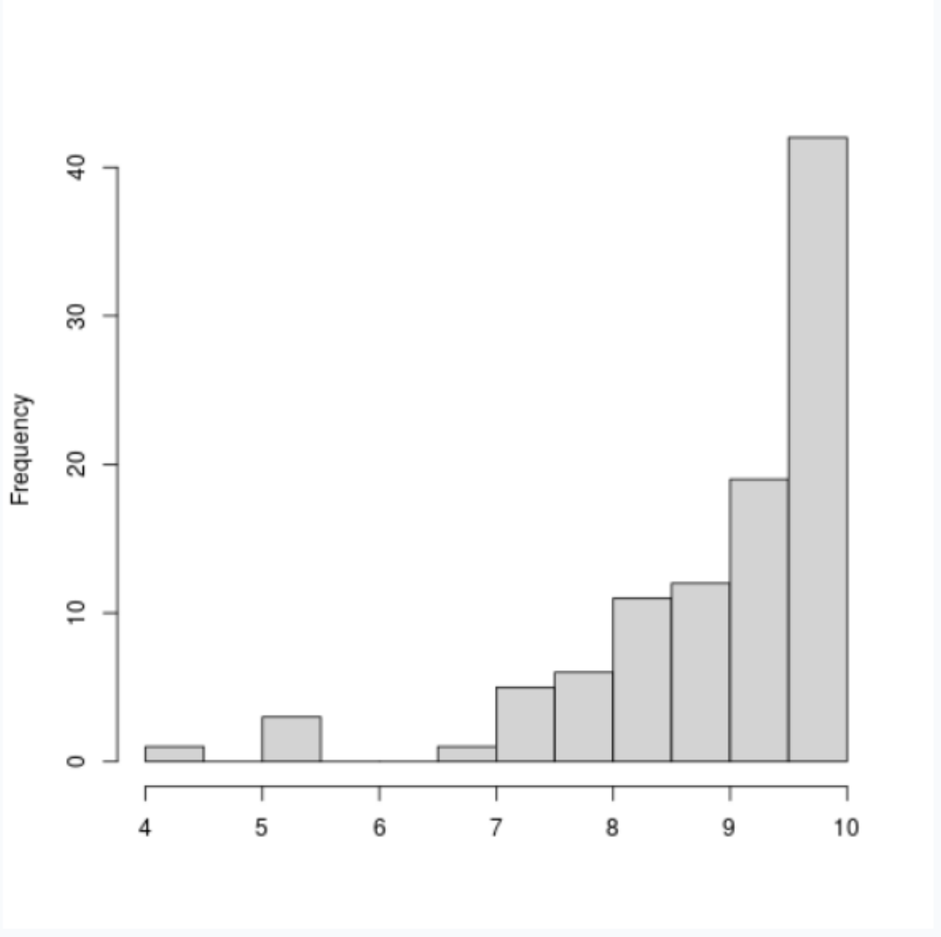
Right-skewed, unimodal, with an outlier (around 5)

0%

Left-skewed, bimodal, with an outlier (around 5)

0%

Distribution 4



(A) Left-skewed, bimodal, with outliers (around 4 and 5)

0%

(B) Left-skewed, unimodal, without outliers

0%

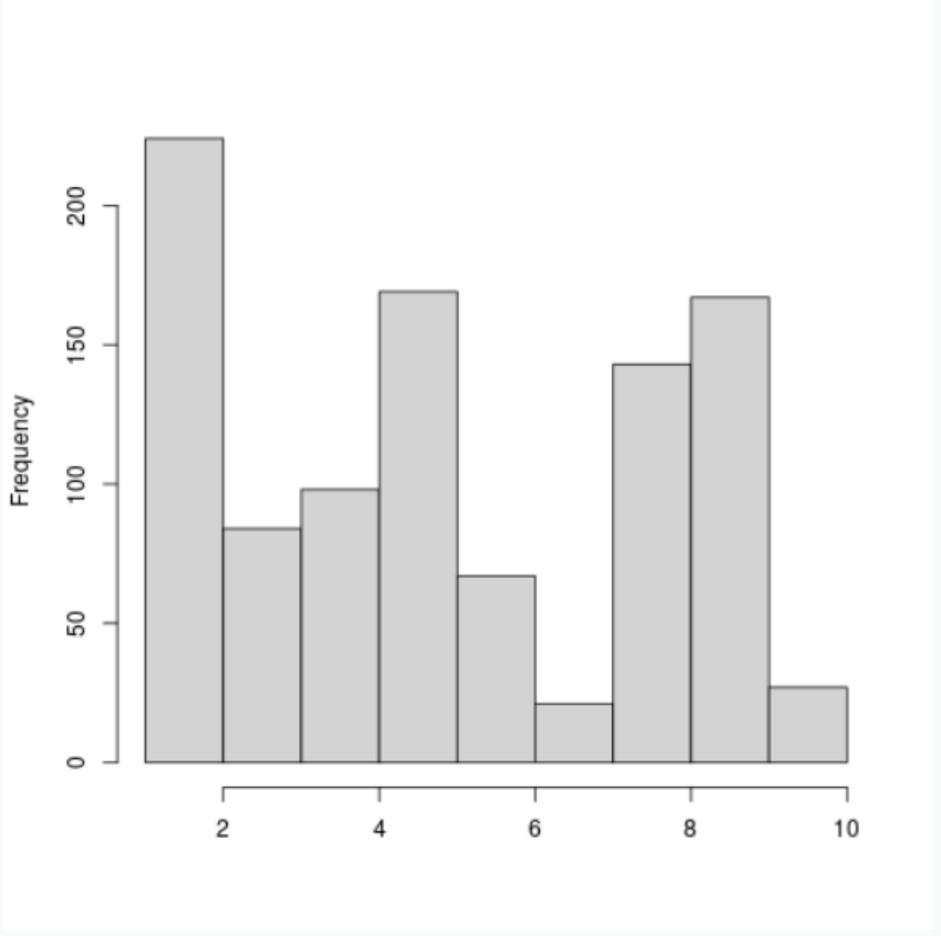
(C) Left-skewed, unimodal, with outliers (around 4 and 5)

0%

(D) Right-skewed, unimodal, with outliers (around 4 and 5)

0%

Distribution 5



The data are unimodal.

0%

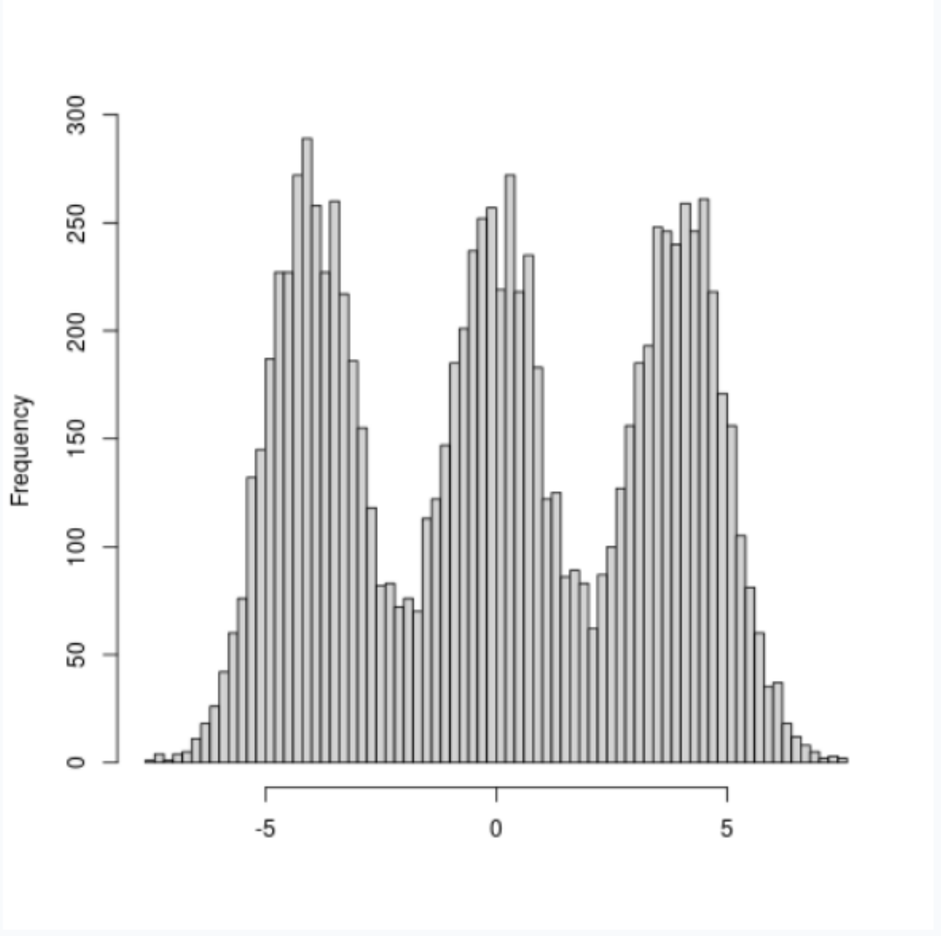
The data are bimodal.

0%

The data are multimodal.

0%

Distribution 6



The distribution is symmetrirc and multimodal. On average values are expected around 0.

0%

The distribution is symmetric and bimodal. On average values are expected around 4.

0%

The distribution is assymetric and multimodal. On average values are expect around -4.

0%

The distribution is assymetric and bimodal. On average values are expected around 0.

0%

None of the above

0%