

Lesson 16: Describing Categorical Data; Proportions; Sampling
Distribtion of a Sample Proportion

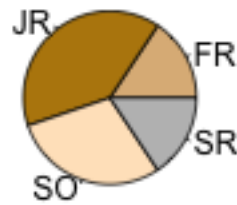
Homework

Solutions

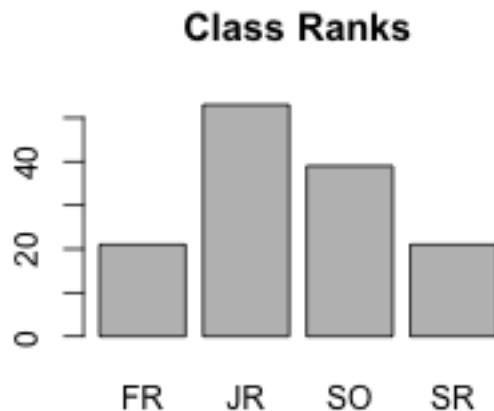
Please note that the steps show rounded numbers, but that the final answers to the problems are calculated without rounding.

| Problem | Part | Solution |
|---------|------|---|
| 1 | - | A pie chart is used for categorical data. Each slice represents a part of a whole. A histogram, on the other hand, is used for quantitative data. It is a visual representation of the spread of a set of data. |

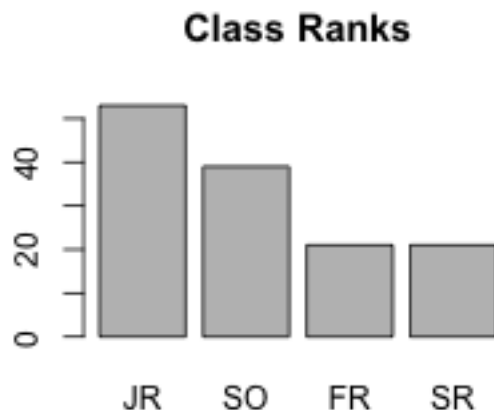
Class Ranks



2 -



3 -



4 -

5 -

The sample proportion \hat{p} will be approximately normal when n is large. How do we know if n is large? We will conclude that n is large when $np \geq 10$ and $n(1 - p) \geq 10$

6 -

7 -

The sample proportion \hat{p} will be approximately normal when:
 $np \geq 10$ and $n(1 - p) \geq 10$

$$1000(0.528) = 528 \geq 10 \text{ and } 1000(1 - 0.528) = 472 \geq 10$$

Since both conditions are true, we conclude that n is sufficiently large so that \hat{p} will be approximately normal.

8 -

The sampling distribution of \hat{p} is approximately normal with mean $p = 0.528$ and standard deviation of 0.016.

9 -

$$z = -1.774$$

10 -

$$P(Z = -1.774) = 0.038$$

11 -

The sample proportion \hat{p} will be approximately normal when:
 $np \geq 10$ and $n(1 - p) \geq 10$

$$4040(0.5) = 2020 \geq 10 \text{ and } 4040(1 - 0.5) = 2020 \geq 10$$

Since both conditions are true, we conclude that n is sufficiently large so that \hat{p} will be approximately normal.

| Problem | Part | Solution |
|---------|------|---|
| 12 | - | The sampling distribution of \hat{p} is approximately normal with mean $p = 0.5$ and standard deviation of 0.008. |
| 13 | - | $P(Z = 0.881 \text{ or } Z = -0.881) = 0.378$ |