Here are 10 key differences between them:

### **1. Purpose**

* **Descriptive Statistics**: Aim to summarize and describe the main features of a dataset. It provides a clear picture of the data through measures of central tendency (mean, median, mode), dispersion (range, variance, standard deviation), and other summary statistics.
* **Inferential Statistics**: Aim to make generalizations or inferences about a population based on a sample. It involves hypothesis testing, estimation, and making predictions to draw conclusions about a larger population.

### **2. Scope**

* **Descriptive Statistics**: Limited to the data at hand. It does not attempt to make predictions or generalizations beyond the dataset.
* **Inferential Statistics**: Goes beyond the immediate data to make predictions or inferences about a broader population. It uses sample data to make probabilistic statements about the population.

### **3. Data Types**

* **Descriptive Statistics**: Uses data from the entire population or sample without assumptions about the larger population.
* **Inferential Statistics**: Uses data from a sample to make inferences or generalizations about the population from which the sample is drawn.

### **4. Methods**

* **Descriptive Statistics**: Involves calculations of mean, median, mode, variance, standard deviation, skewness, kurtosis, and frequency distributions.
* **Inferential Statistics**: Involves hypothesis testing (t-tests, chi-square tests), confidence intervals, regression analysis, ANOVA, and other methods to estimate population parameters.

### **5. Representation**

* **Descriptive Statistics**: Represents data using graphs (histograms, bar charts, pie charts) and tables (frequency tables, cross-tabulations).
* **Inferential Statistics**: Uses statistical models and tests to infer population characteristics and relationships, often relying on probability theory.

### **6. Assumptions**

* **Descriptive Statistics**: No assumptions are made about the data beyond its basic structure and properties.
* **Inferential Statistics**: Assumptions about the data and the population (e.g., normality, independence) are often required to apply inferential methods correctly.

### **7. Outcome**

* **Descriptive Statistics**: Produces summary measures and visualizations that describe the data.
* **Inferential Statistics**: Produces conclusions or predictions about a population, often expressed in terms of probabilities and confidence levels.

### **8. Example Use Case**

* **Descriptive Statistics**: Reporting the average test score of a class or the distribution of ages in a survey.
* **Inferential Statistics**: Testing whether a new drug is more effective than an existing one based on clinical trial data or estimating the average income of a city based on a sample survey.

### **9. Decision-Making**

* **Descriptive Statistics**: Provides insights and information to understand data characteristics and trends.
* **Inferential Statistics**: Supports decision-making by providing estimates, testing hypotheses, and predicting future outcomes based on statistical evidence.

### **10. Statistical Techniques**

* **Descriptive Statistics**: Simple calculations and visualizations such as mean, median, mode, and standard deviation.
* **Inferential Statistics**: More complex techniques such as regression analysis, hypothesis testing (t-tests, chi-square tests), ANOVA, and Bayesian inference.