Section B
Summarizing Qualitative

Descriptive statistics consists of methods to organize and summarize data clearly and effectively. Organizing and summarizing the data is useful, since it helps the researcher see the important aspects of the data collected. In section A, two types of variables were discussed; qualitative (categorical) and quantitative. In this section, you will learn how to organize and summarize **qualitative data** using tables and graphs.

The **frequency** of a category is the number of times it occurs in the data set.

A **frequency distribution** lists each category of data and the number of occurrences for each category of data.

The **relative frequency** is the ratio (proportion or fraction) of the frequency of each category to the total frequency and it is found by

$$\text{relative frequency} = \frac{\text{frequency}}{\text{Sum of all frequencies}}$$

A **relative frequency distribution** lists each category of data together with the relative frequency.

Bar graphs, and **pie charts** are devices to graphically represent qualitative data.

Examples

1) The class levels of 25 students in an elementary statistics course are as follows;

Fr So So Jr Jr Jr Sr Fr So Jr So So Jr Sr Sr So Jr So So Jr Sr Jr So So Sr

a) Construct a frequency distribution.
b) Add a relative frequency column to the frequency distribution.
c) What percent of the data are sophomores? **0.40*100 = 40%**
d) How many students are juniors? **8**
e) Construct a bar graph using the frequency of the data.
f) Construct a pie chart using the relative frequency of the data.

a and b)

Class Level	Frequency	Relative Frequency
Fr	2	$\frac{2}{25} = 0.08$
So	10	$\frac{10}{25} = 0.40$
Jr	8	$\frac{8}{25} = 0.32$
Sr	5	$\frac{5}{25} = 0.20$
Total	25	1.00
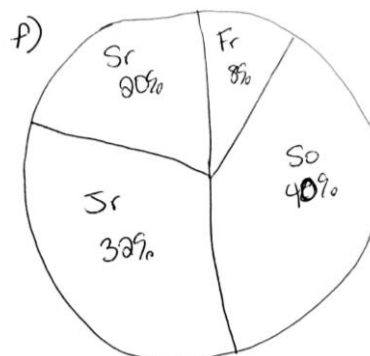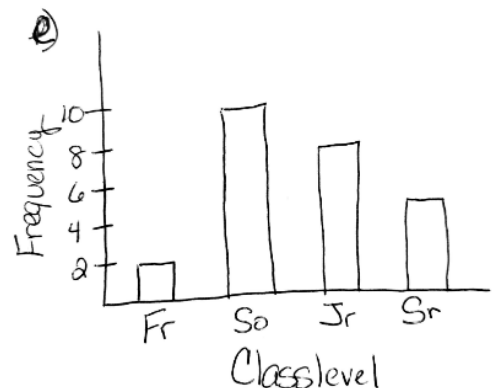
2) A researcher evaluated the taste of four leading brands of instant coffee by having a sample of 80 individuals taste each coffee and then select their favorite. The results are given:

```
A  D  B  B  D  A  D  B  C  A  B  B  C  A  D  A  B  D  B  B
D  B  C  B  B  A  B  C  B  B  A  A  D  C  B  B  A  B  C  B
B  B  A  C  D  D  A  B  D  D  B  B  C  B  A  D  D  C  B  D
C  D  B  C  B  B  B  D  A  B  B  C  B  D  B  B  D  D  B  B
```

a) Construct a Frequency table.   b) Add a relative frequency column to the distribution you constructed in part (a). Round answers to two decimal places.

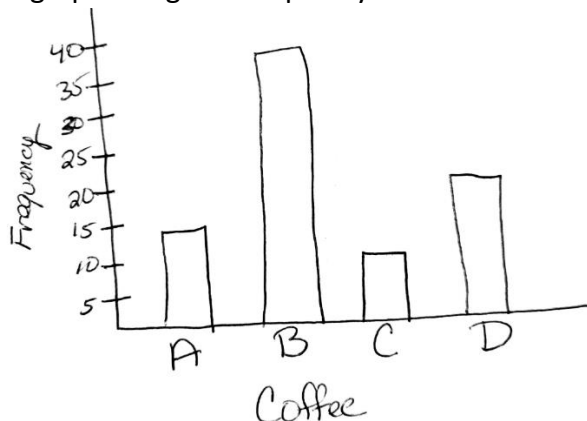| Brand	Frequency	Relative Frequency
A	13	$\frac{13}{80} = 0.16$
B	36	$\frac{36}{80} = 0.45$
C	12	$\frac{12}{80} = 0.15$
D	19	$\frac{19}{80} = 0.24$
Total	80	1.00

c) **What percent** of the people chose Brand C as their favorite? **0.15*100 = 15%**

d) **How many** people chose Brand A as their favorite?   **13**

e) **What percent** of the people chose Brand B or Brand D as their favorite? **(0.45 + 0.24)*100 = 69%**

                                   or   **(36 + 19)/80*100 = 68.75% → 69%**

f) Construct a bar graph using the frequency of the data.

g) Construct a pie chart using the relative frequency of the data.

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