7 Case Studies

7.1 Case Study 1: Tables, Graphs, and Numeric Summaries

The following exercises are also in the Excel file:
Pelican Stores.xlsx

Answers to the following exercises are in the Excel file:
Pelican Stores KEY.xlsx

Pelican Stores, a division of National Clothing, is a chain of women's apparel stores operating throughout the country. The chain recently ran a promotion in which discount coupons were sent to customers of other National Clothing stores.

The ***Proprietary card*** method of payment refers to charges made using a National Clothing charge card. Customers who made purchases using a discount coupon are referred to as ***promotional customers***. Because the promotional coupons were not sent to regular Pelican Stores customers, ***management considers the sales made to people presenting the promotional coupon as sales it would not otherwise make.*** Of course, Pelican also hopes that the promotional customers will continue to shop at its stores.

Variable	**Description**
Customer ID:	Unique Identifier
Type of customer:	Regular, Promotional (promotional customer received discount coupon)
Items:	The total number of items purchased
Net Sales:	The total amount in dollars charged to the credit card
Method of Payment:	Discover, Visa, MasterCard, American Express, Proprietary Card
Gender:	Male, Female
Marital Status:	Married, Single
Age:	Customer age in years

1. Identify the type of data (qualitative/quantitative) and the level of measurement (nominal or ordinal/interval or ratio) for the variable, ***Marital Status***.

2. What would be the appropriate type of graph to visually display the distribution of ***Marital Status***?

3. Identify the type of data (qualitative/quantitative) and the level of measurement (nominal or ordinal/interval or ratio) for the variable, ***Age***.

4. What would be the appropriate type of graph to visually display the distribution of ***Age***?

An example of the first 8 entries of the Pelican Stores sales transactions are shown below.

Customer	Type of Customer	Items	Net Sales	Method of Payment	Gender	Marital Status	Age
1	Regular	1	39.50	Discover	Male	Married	32
2	Promotional	1	102.40	Proprietary Card	Female	Married	36
3	Regular	1	22.50	Proprietary Card	Female	Married	32
4	Promotional	5	100.40	Proprietary Card	Female	Married	28
5	Regular	2	54.00	MasterCard	Female	Married	34
6	Regular	1	44.50	MasterCard	Female	Married	44
7	Promotional	2	78.00	Proprietary Card	Female	Married	30
8	Regular	1	22.50	Visa	Female	Married	40

The frequency, relative frequency, and cumulative relative frequency distributions for ***Net Sales*** are given below.

BinsSales	Frequency	Relative Frequency	Cumulative Relative Frequency
13 to <44	27	0.27	0.27
44 to <75	37	0.37	0.64
75 to <106	14	0.14	0.78
106 to <137	8	0.08	0.86
137 to <168	7	0.07	0.93
168 to <199	3	0.03	0.96
199 to <230	1	0.01	0.97
230 to <261	1	0.01	0.98
261 to <292	2	0.02	1.00
Total	100	1	

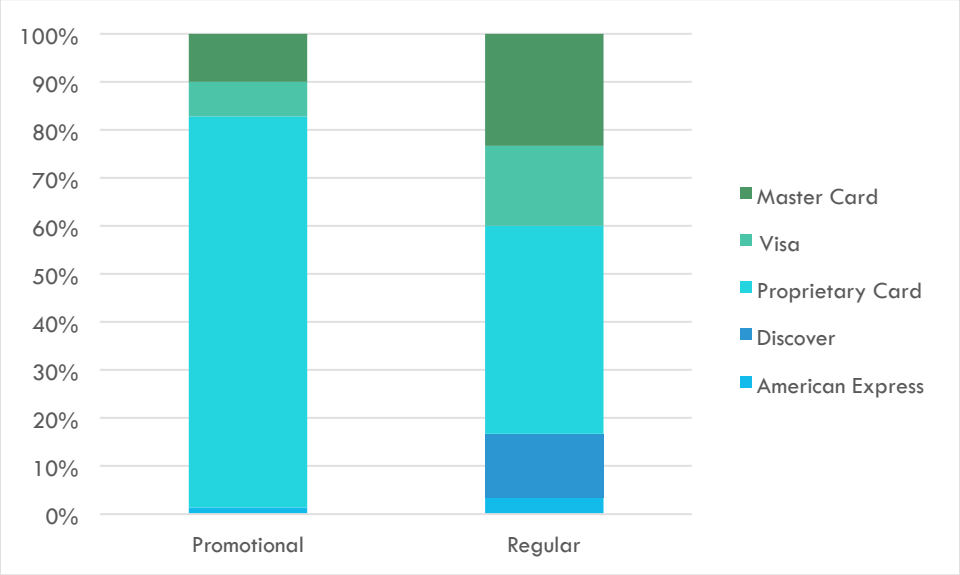
5. How many customers spent at least $168 but less than $230?

6. What is the relative frequency of customers who spent at least $44 but less than $75?

7. What percentage of customers spent less than $137? At least $199?

8. Would you describe the distribution of ***Net Sales*** as symmetric or skewed?

9. Briefly summarize the distribution of ***Net Sales***…describe the typical customer.



Type of Customer	American Express	Discover	Proprietary Card	Visa	Master Card	Grand Total
Promotional	1.43%	0.00%	81.43%	7.14%	10.00%	100.00%
Regular	3.33%	13.33%	43.33%	16.67%	23.33%	100.00%
Grand Total	**2.00%**	**4.00%**	**70.00%**	**10.00%**	**14.00%**	**100.00%**

10. Using the two way pivot table and stacked bar chart, would you say that type of customer influences the method of payment. Explain. For each bar, the dark shaded area represents promotional customers and the light shaded area represents regular customers.

11. For the distribution of **Net Sales**, do you expect the mean to be equal to, less than, or greater than the median?

12. What measure of center and spread would best summarize the distribution, mean/standard deviation or median/5-number summary?

Net Sales Numeric Summary	
Mean	
Standard Deviation	
Minimum	
Q1	
Median	
Q3	
Maximum	

13. Sketch a box plot of the distribution of ***Net Sales***. Find outliers using the 1.5 x IQR method.