



REPORT SERIES WITH DLOOKR

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# Exploratory Data Analysis Report

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# Chapter 1

## Introduction

The EDA Report provides exploratory data analysis information on objects that inherit `data.frame` and `data.frame`.

### 1.1 Information of Dataset

The dataset that generated the EDA Report is an 'data.frame' object. It consists of 400 observations and 11 variables.

### 1.2 Information of Variables

Table 1.1: Information of Variables

variables	types	missing_count	missing_percent	unique_count	unique_rate
Sales	numeric	0	0.00	336	0.8400
CompPrice	numeric	0	0.00	73	0.1825
Income	numeric	20	5.00	99	0.2475
Advertising	numeric	0	0.00	28	0.0700
Population	numeric	0	0.00	275	0.6875
Price	numeric	0	0.00	101	0.2525
ShelveLoc	factor	0	0.00	3	0.0075
Age	numeric	0	0.00	56	0.1400
Education	numeric	0	0.00	9	0.0225
Urban	factor	5	1.25	3	0.0075
US	factor	0	0.00	2	0.0050

The target variable of the data is 'US', and the data type of the variable is factor.

### 1.3 About EDA Report

EDA reports provide information and visualization results that support the EDA process. In particular, it provides a variety of information to understand the relationship between the target variable and the rest of the variables of interest.



## Chapter 2

# Univariate Analysis

### 2.1 Descriptive Statistics

edaData  
11 Variables 400 Observations

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**Sales**

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
400	0	336	1	7.496	3.192	3.149	4.119	5.390	7.490	9.320	11.300	12.442

lowest : 0.00 0.16 0.37 0.53 0.91, highest: 13.91 14.37 14.90 15.63 16.27

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**CompPrice**

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
400	0	73	0.999	125	17.3	.98	106	115	125	135	145	150

lowest : 77 85 86 88 89, highest: 157 159 161 162 175

---

**Income**

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
380	20	98	1	68.73	32.58	26.0	30.0	42.0	69.0	91.0	108.1	115.1

lowest : 21 22 23 24 25, highest: 116 117 118 119 120

---

**Advertising**

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
400	0	28	0.952	6.635	7.337	0	0	0	5	12	16	19

lowest : 0 1 2 3 4, highest: 23 24 25 26 29

---

**Population**

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
400	0	275	1	264.8	170.3	29.0	58.9	139.0	272.0	398.5	467.0	493.1

lowest : 10 12 13 14 16, highest: 503 504 507 508 509

---

**Price**

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
400	0	101	1	115.8	26.52	77	87	100	117	131	146	155

lowest : 24 49 53 54 55, highest: 166 171 173 185 191

---

**ShelveLoc**

n	missing	distinct
400	0	3

Value	Bad	Good	Medium
Frequency	96	85	219
Proportion	0.240	0.212	0.547

---

<b>Age</b>													
	n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75		
	400	0	56	1	53.32	18.71	27.00	30.00	39.75	54.50	66.00	.90	.95

lowest : 25 26 27 28 29, highest: 76 77 78 79 80

<b>Education</b>													
	n	missing	distinct	Info	Mean	Gmd							
	400	0	9	0.987	13.9	3.009							

lowest : 10 11 12 13 14, highest: 14 15 16 17 18

Value	10	11	12	13	14	15	16	17	18
Frequency	48	48	49	43	40	36	47	49	40
Proportion	0.120	0.120	0.122	0.108	0.100	0.090	0.117	0.122	0.100

<b>Urban</b>		
n	missing	distinct
395	5	2

Value	No	Yes
Frequency	117	278
Proportion	0.296	0.704

<b>US</b>		
n	missing	distinct
400	0	2

Value	No	Yes
Frequency	142	258
Proportion	0.355	0.645

## 2.2 Normality Test of Numerical Variables

### 2.2.1 Statistics and Visualization of (Sample) Data

#### Sales

normality test : Shapiro-Wilk normality test  
 statistic : 0.9952, p-value : 0.253975

type	skewness	kurtosis
original	0.1849	2.9052
log transformation		
sqrt transformation	-0.7389	4.9166

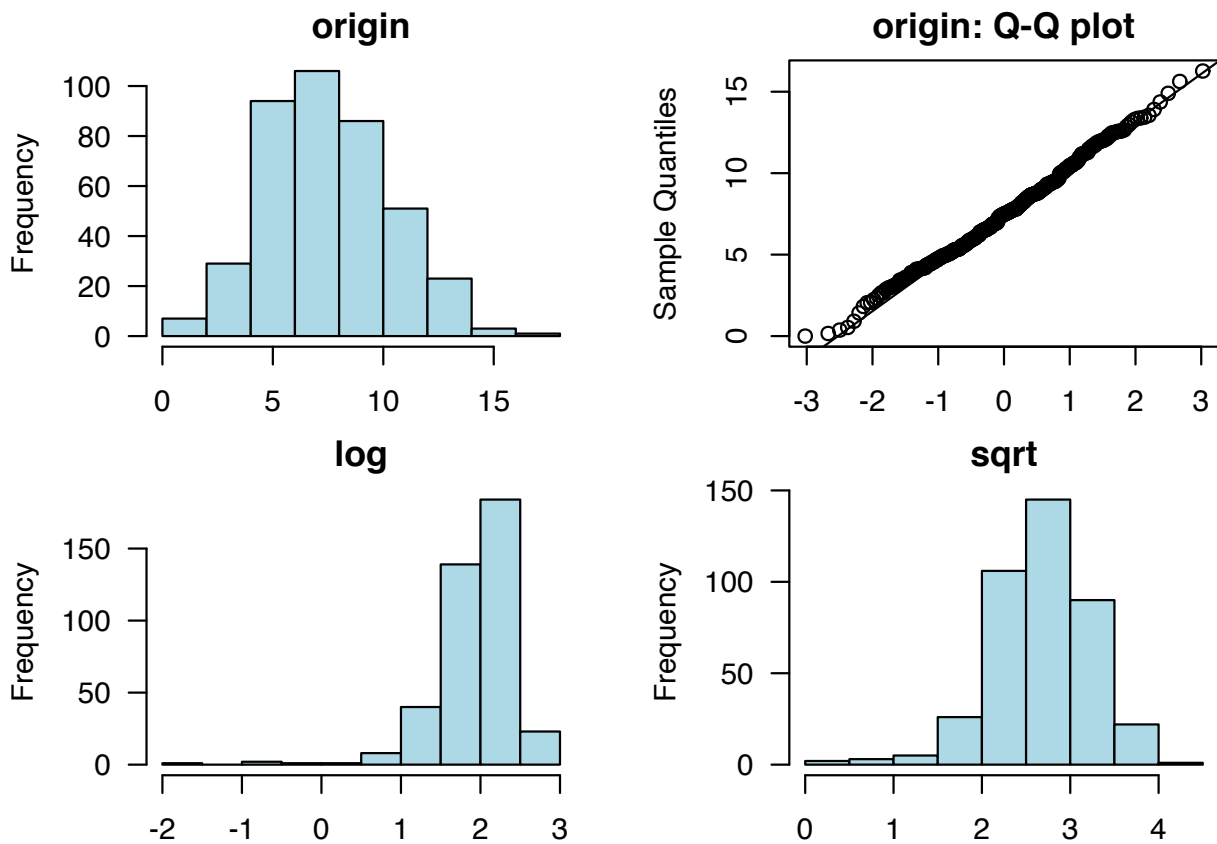


Figure 2.1: Sales

**CompPrice**

normality test : Shapiro-Wilk normality test  
 statistic : 0.99843, p-value : 0.977151

type	skewness	kurtosis
original	-0.0426	3.0262
log transformation	-0.4347	3.3671
sqrt transformation	-0.2347	3.1280

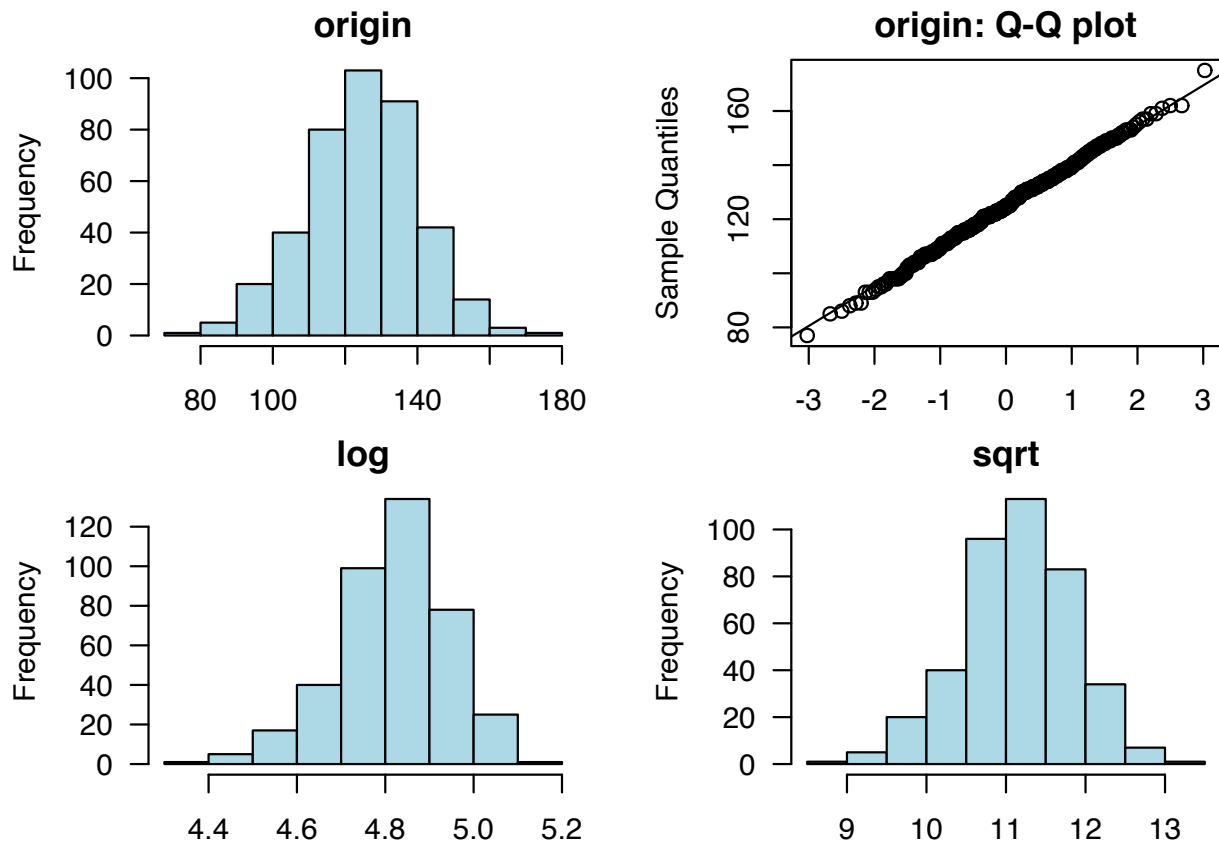


Figure 2.2: CompPrice



**Income**

normality test : Shapiro-Wilk normality test  
 statistic : 0.95874, p-value : 7.60829E-09

type	skewness	kurtosis
original	0.0607	1.8920
log transformation	-0.5516	2.2197
sqrt transformation	-0.2369	1.9444

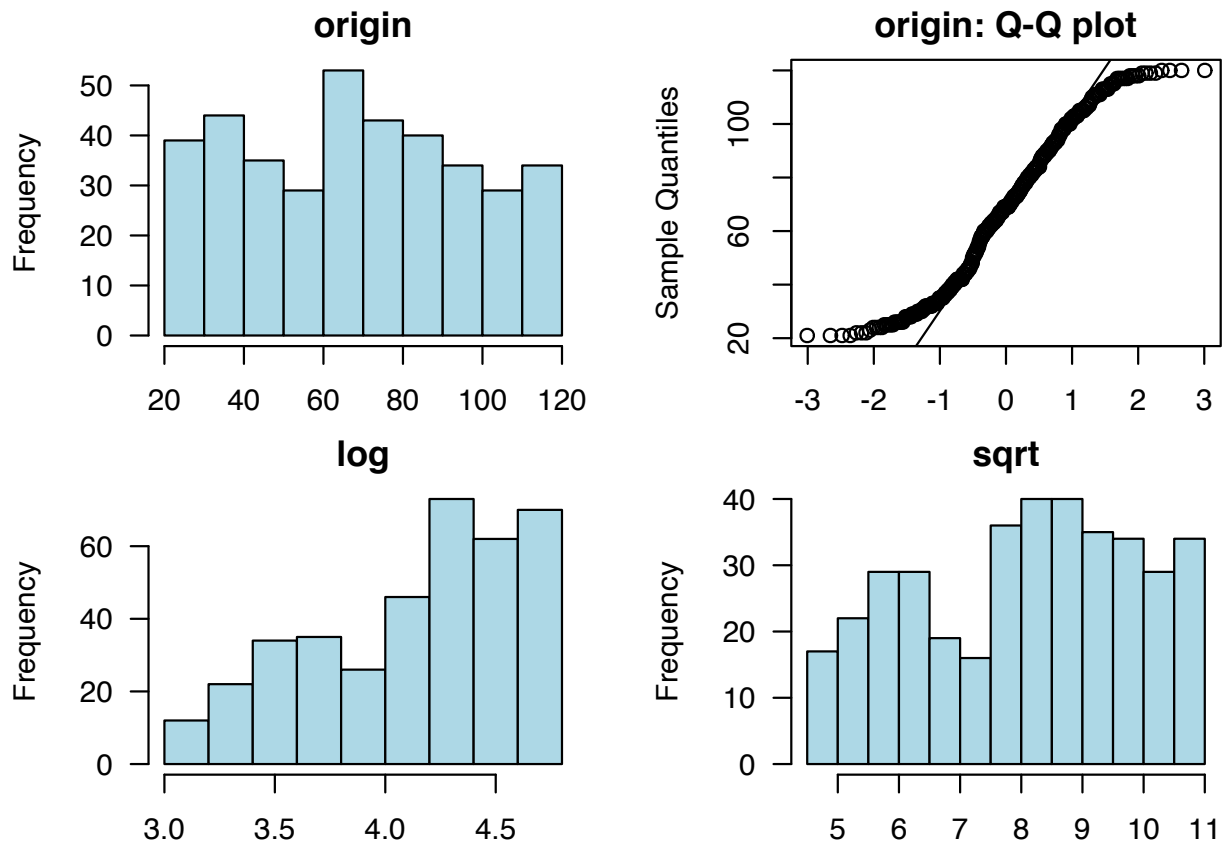


Figure 2.3: Income

### Advertising

normality test : Shapiro-Wilk normality test  
 statistic : 0.87354, p-value : 1.49183E-17

type	skewness	kurtosis
original	0.6372	2.4467
log transformation		
sqrt transformation	-0.0565	1.4653

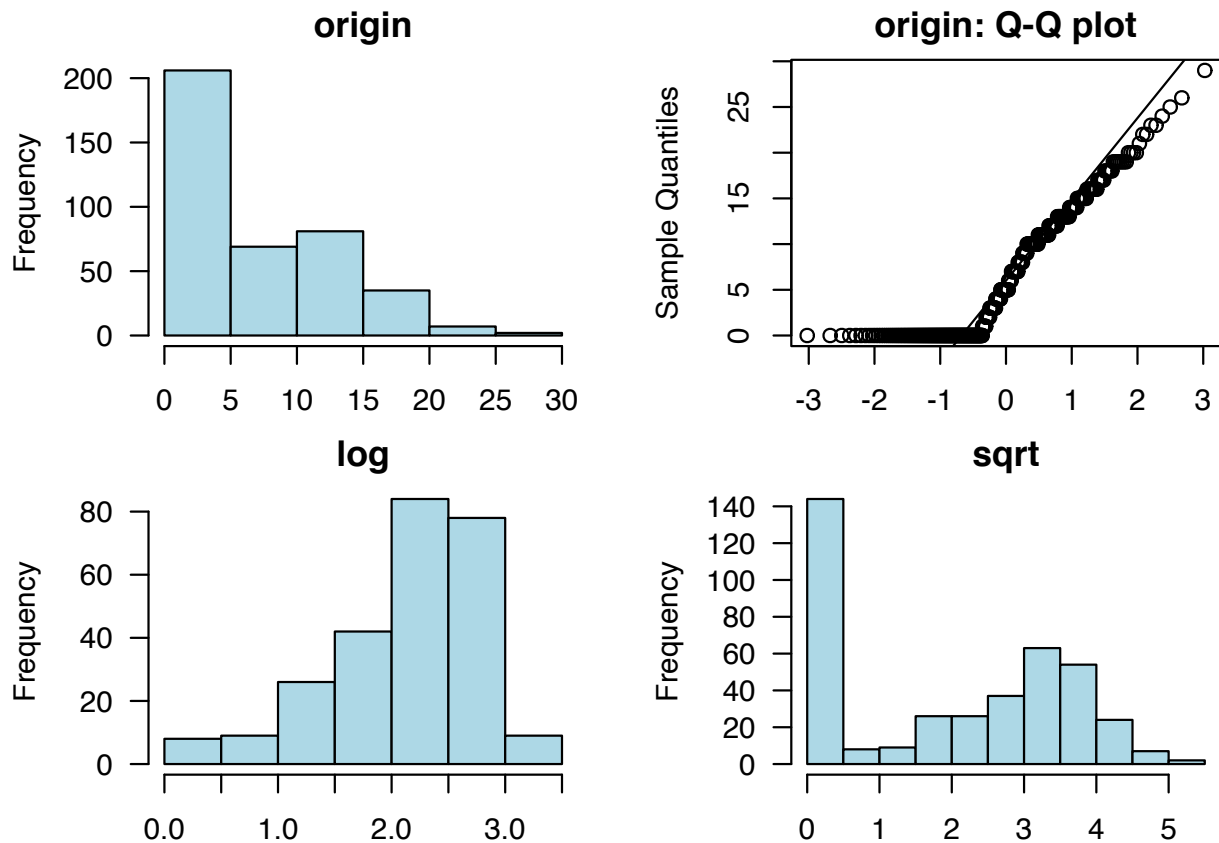


Figure 2.4: Advertising

**Population**

normality test : Shapiro-Wilk normality test  
 statistic : 0.95201, p-value : 4.08085E-10

type	skewness	kurtosis
original	-0.0510	1.7977
log transformation	-1.2945	4.1336
sqrt transformation	-0.5427	2.2584

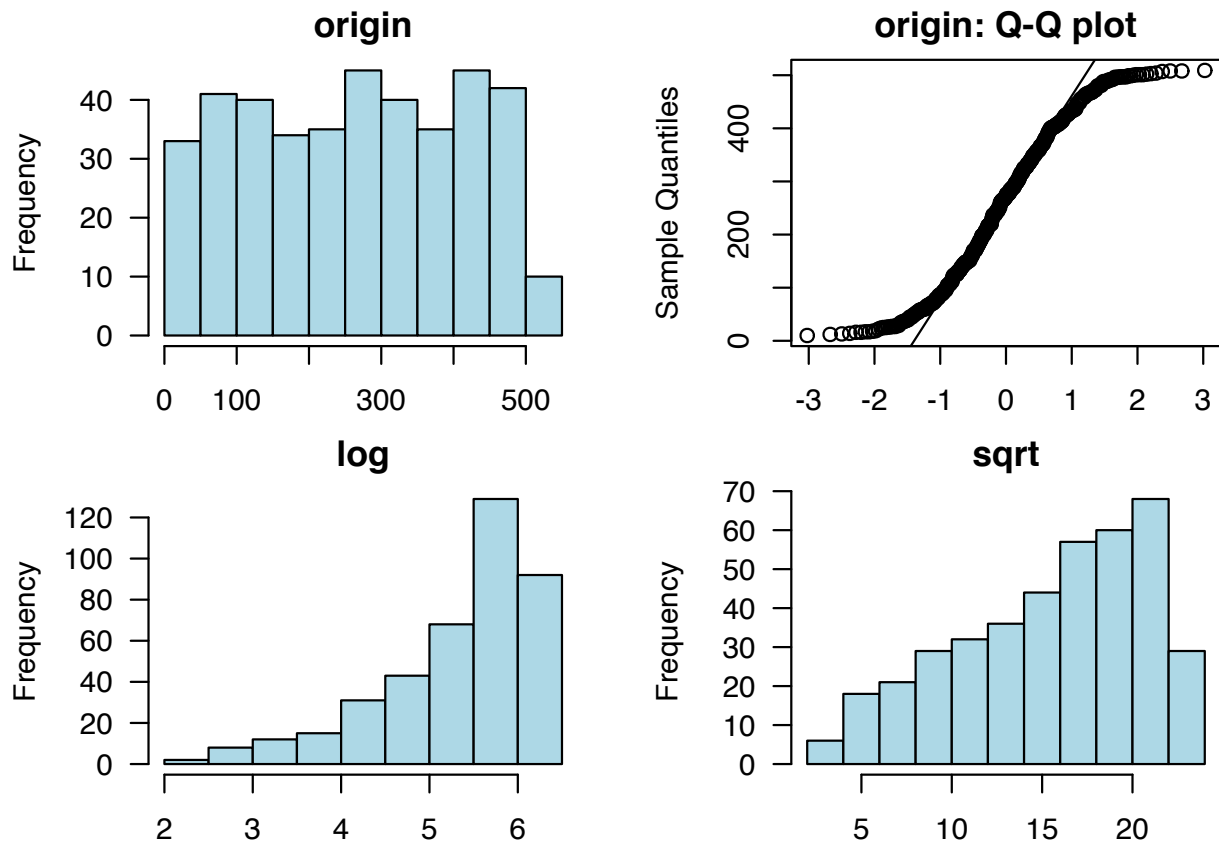


Figure 2.5: Population

**Price**

normality test : Shapiro-Wilk normality test  
 statistic : 0.99592, p-value : 0.390213

type	skewness	kurtosis
original	-0.1248	3.4313
log transformation	-1.3589	8.6448
sqrt transformation	-0.6083	4.5887

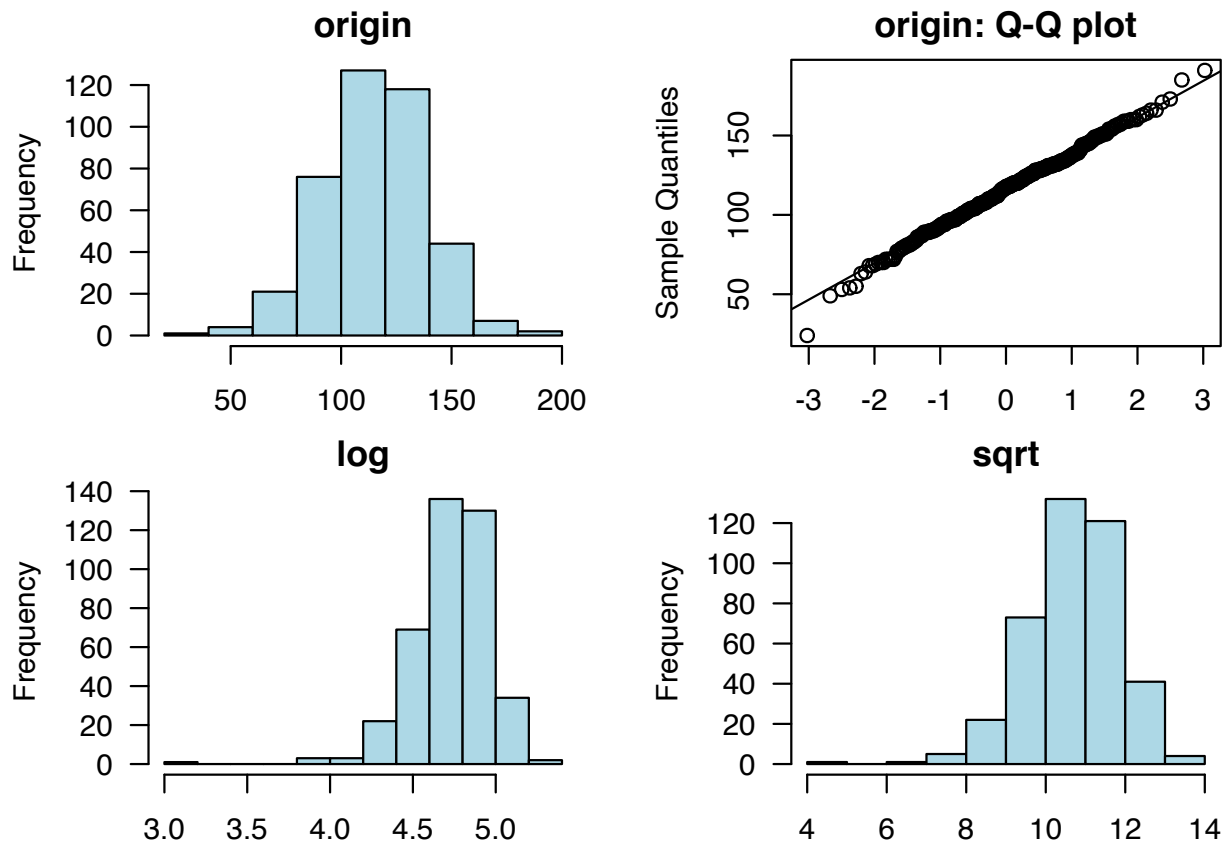


Figure 2.6: Price

**Age**

normality test : Shapiro-Wilk normality test  
 statistic : 0.95672, p-value : 1.86455E-09

type	skewness	kurtosis
original	-0.0769	1.8648
log transformation	-0.5112	2.1718
sqrt transformation	-0.2890	1.9631

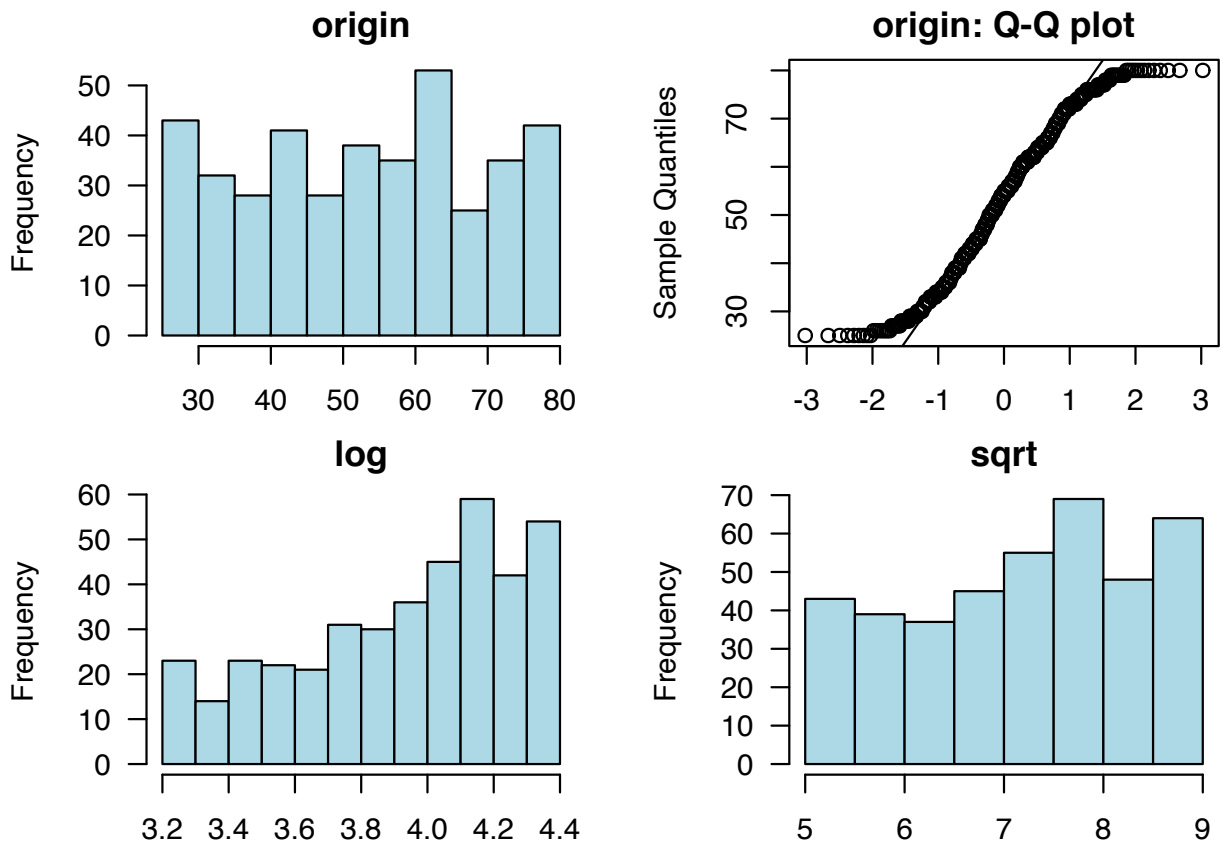


Figure 2.7: Age

**Education**

normality test : Shapiro-Wilk normality test  
 statistic : 0.9242, p-value : 2.42693E-13

type	skewness	kurtosis
original	0.0438	1.7029
log transformation	-0.1599	1.7434
sqrt transformation	-0.0572	1.7118

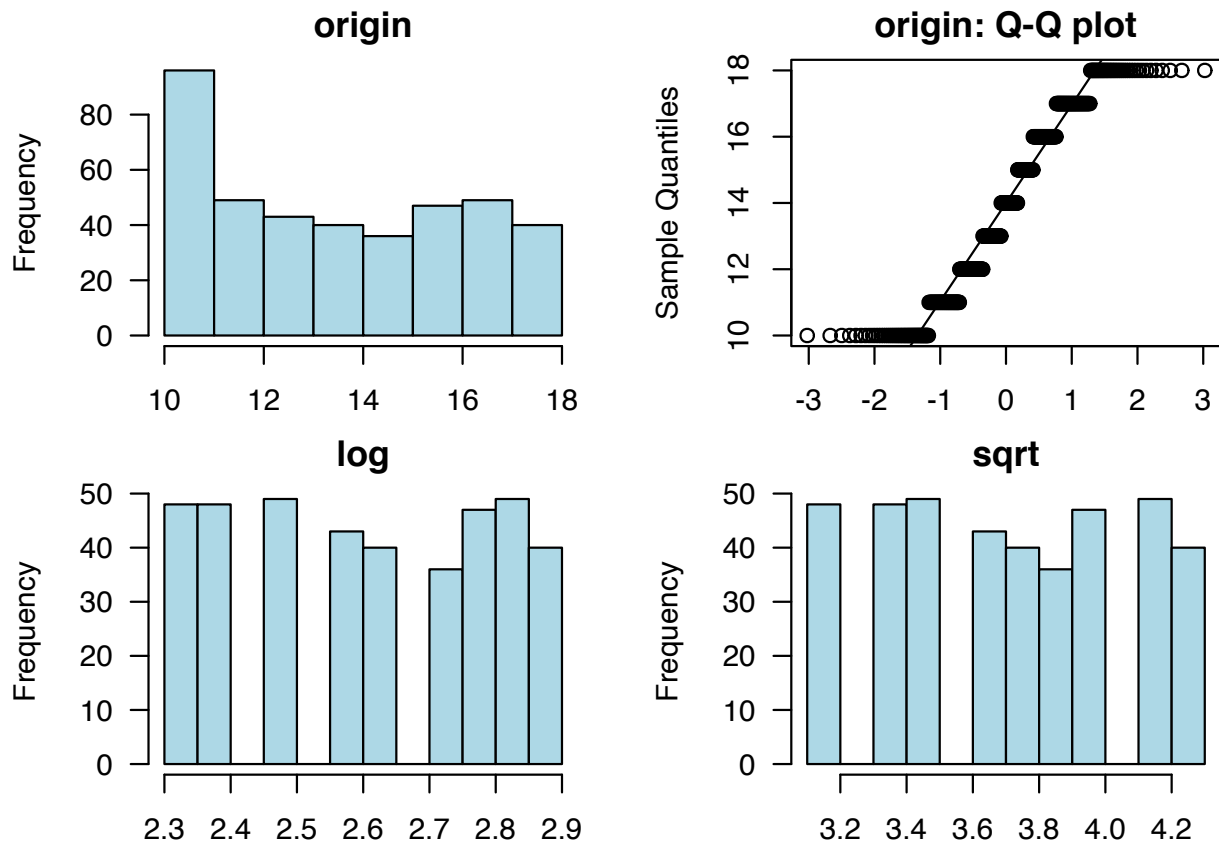


Figure 2.8: Education

## Chapter 3

# Relationship Between Variables

### 3.1 Correlation Coefficient

#### 3.1.1 Correlation Coefficient by Variable Combination

Table 3.1: The correlation coefficients (0.5 or more)

Variable1	Variable2	Correlation Coefficient
Price	CompPrice	0.585

#### 3.1.2 Correlation Plot of Numerical Variables

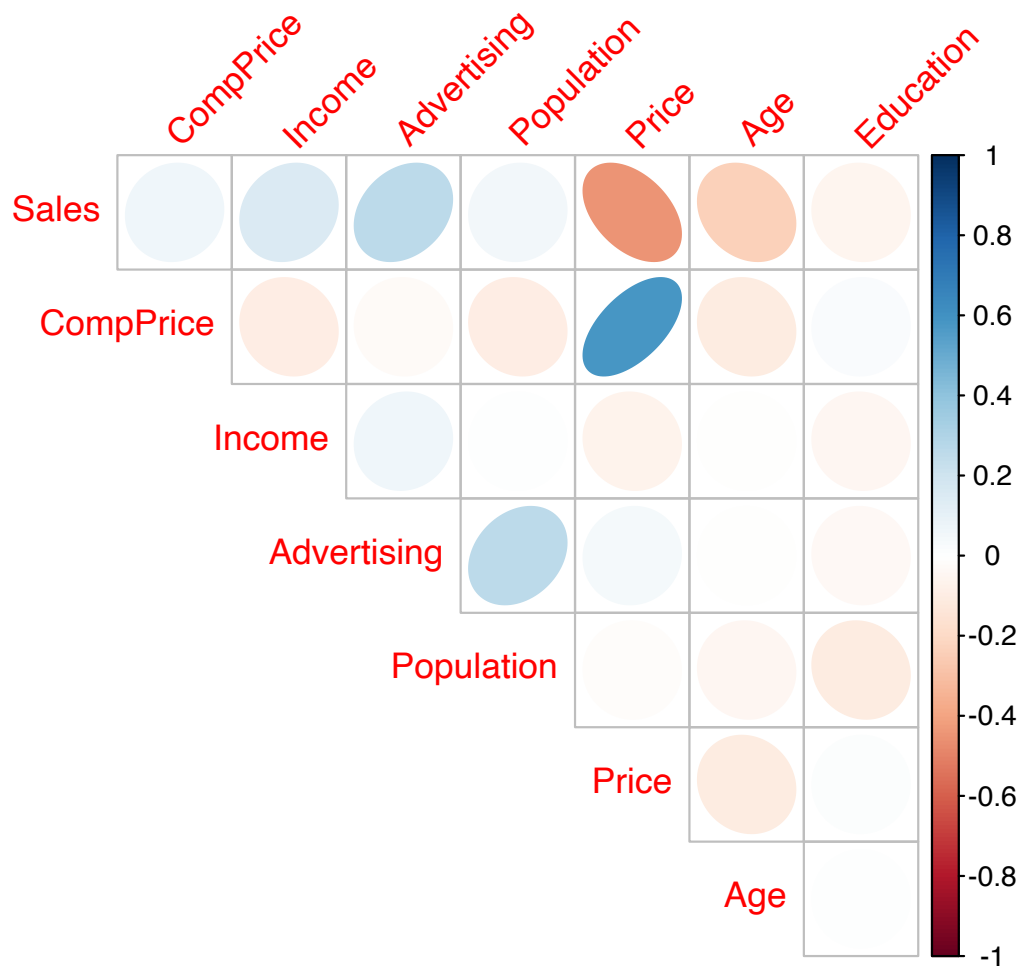


Figure 3.1: The correlation coefficient of numerical variables



## Chapter 4

# Target based Analysis

### 4.1 Grouped Descriptive Statistics

#### 4.1.1 Grouped Numerical Variables

Sales

Table 4.1: Sales

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	7.87	6.82
sd	2.88	2.60
se(mean)	0.18	0.22
IQR	4.23	3.44
skewness	0.08	0.32
kurtosis	-0.33	0.81
0%	0.37	0.00
1%	1.65	0.47
5%	3.15	3.25
10%	4.18	3.92
20%	5.33	4.75
25%	5.76	5.08
30%	6.15	5.31
40%	6.92	5.99
50%	7.79	6.66
60%	8.65	7.50
70%	9.45	7.96
75%	9.99	8.52
80%	10.46	8.77
90%	11.74	9.35
95%	12.54	11.28
99%	13.64	14.03
100%	16.27	14.90

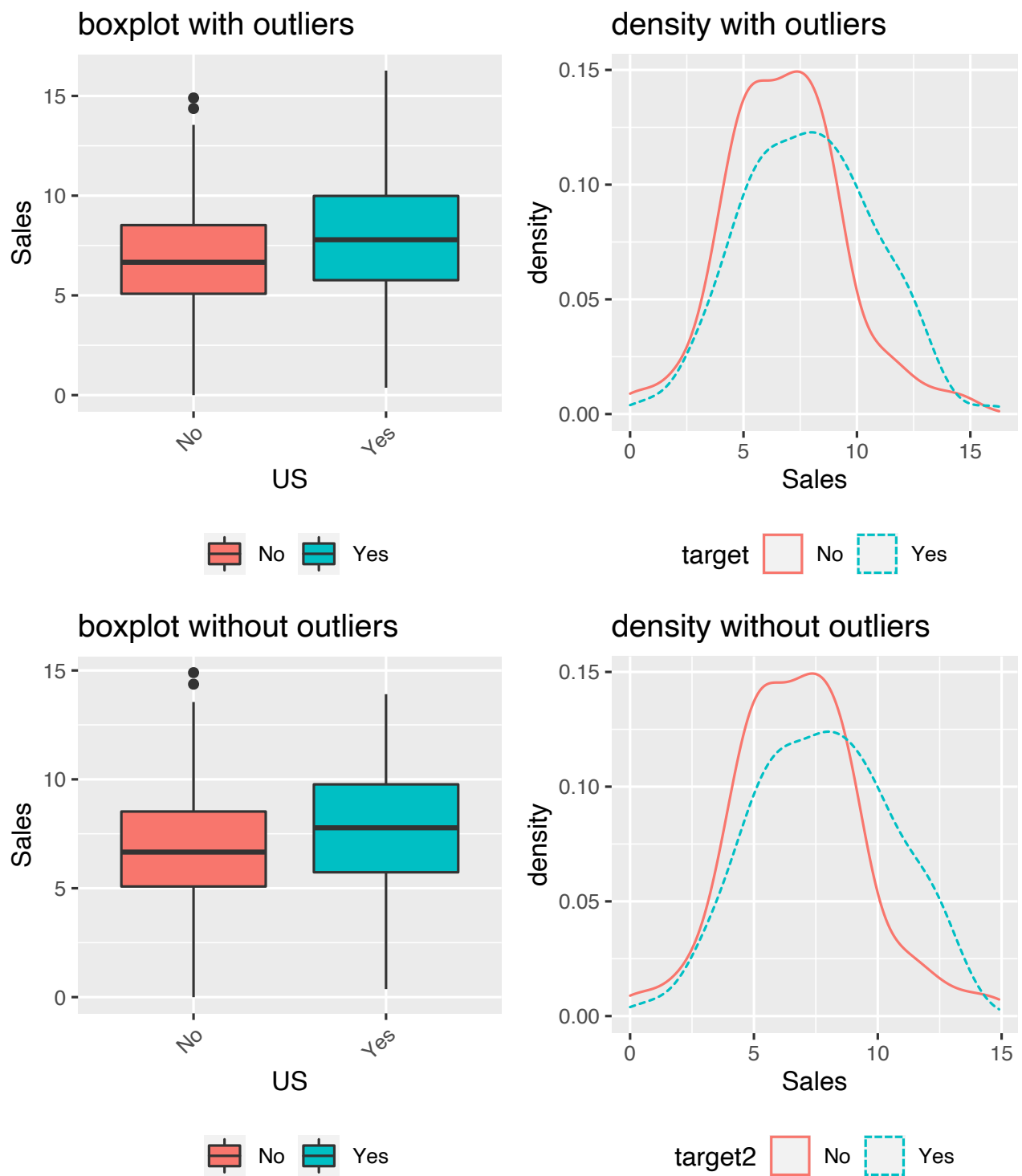


Figure 4.1: Sales

**CompPrice**

Table 4.2: CompPrice

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	125.17	124.63
sd	14.97	16.02
se(mean)	0.93	1.34
IQR	19.75	19.00
skewness	0.01	-0.11
kurtosis	0.06	0.01
0%	85.00	77.00
1%	91.28	87.23
5%	100.00	98.00
10%	106.70	106.00
20%	113.00	112.20
25%	115.25	115.00
30%	117.00	116.00
40%	122.00	121.00
50%	125.00	124.00
60%	130.00	128.60
70%	133.00	132.00
75%	135.00	134.00
80%	137.00	138.00
90%	144.00	145.90
95%	149.00	152.00
99%	161.43	158.18
100%	175.00	159.00

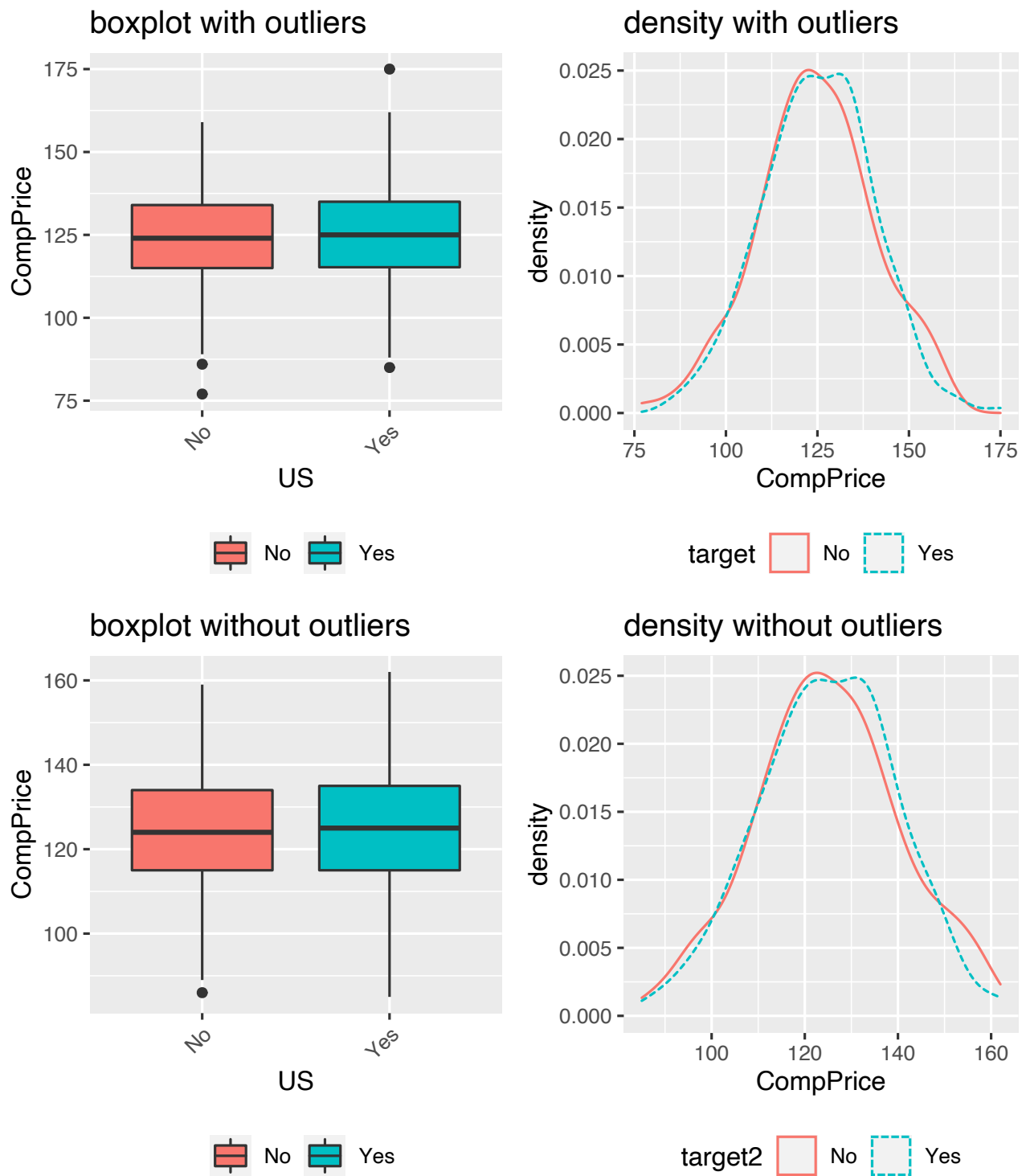


Figure 4.2: CompPrice

**Income**

Table 4.3: Income

	Yes	No
n	242.00	138.00
NA	16.00	4.00
mean	70.62	65.41
sd	28.31	27.89
se(mean)	1.82	2.37
IQR	48.75	48.75
skewness	0.01	0.15
kurtosis	-1.09	-1.11
0%	21.00	22.00
1%	21.00	22.00
5%	26.05	25.85
10%	32.00	30.00
20%	41.20	34.40
25%	44.25	39.00
30%	52.00	44.10
40%	63.40	59.00
50%	70.00	66.50
60%	79.00	73.00
70%	88.00	82.00
75%	93.00	87.75
80%	100.00	92.60
90%	111.00	105.30
95%	117.00	111.30
99%	119.59	117.63
100%	120.00	120.00

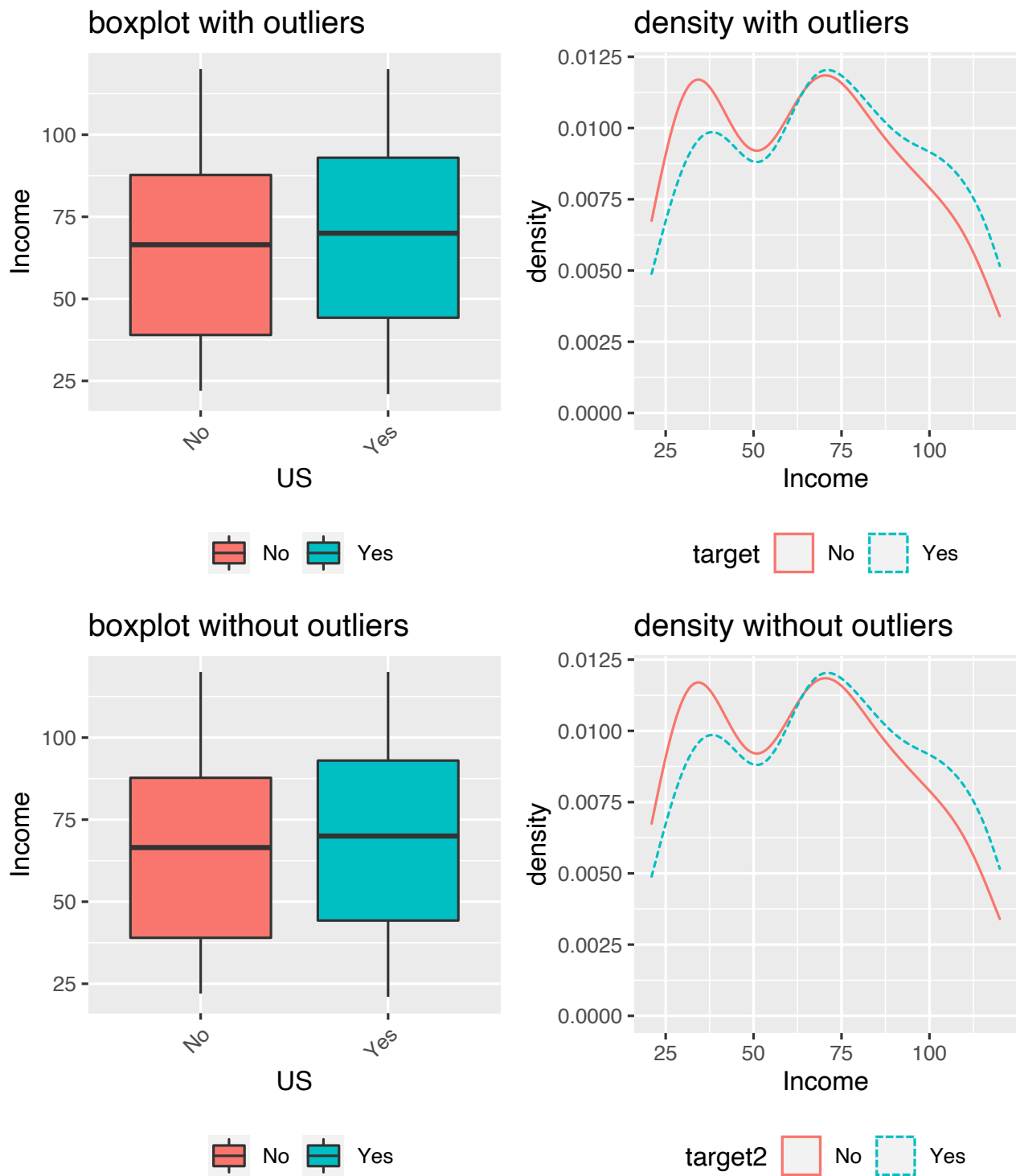


Figure 4.3: Income

**Advertising**

Table 4.4: Advertising

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	10.01	0.51
sd	5.92	1.64
se(mean)	0.37	0.14
IQR	9.00	0.00
skewness	0.21	3.98
kurtosis	-0.23	17.74
0%	0.00	0.00
1%	0.00	0.00
5%	0.00	0.00
10%	2.00	0.00
20%	5.00	0.00
25%	5.00	0.00
30%	7.00	0.00
40%	9.00	0.00
50%	10.00	0.00
60%	11.20	0.00
70%	13.00	0.00
75%	14.00	0.00
80%	15.00	0.00
90%	18.00	1.90
95%	19.15	4.00
99%	24.43	7.77
100%	29.00	11.00

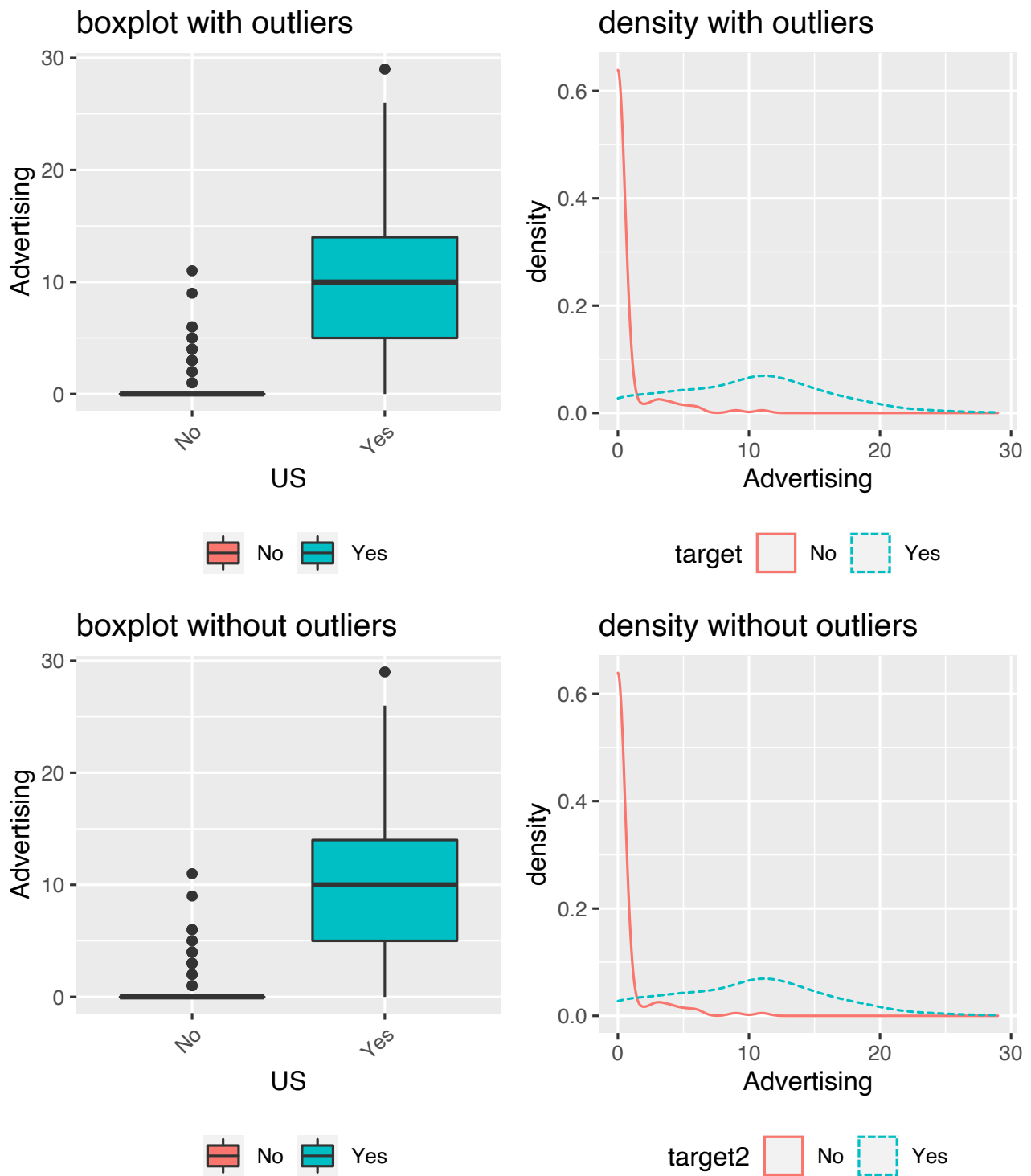


Figure 4.4: Advertising



**Population**

Table 4.5: Population

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	271.45	252.82
sd	144.44	152.36
se(mean)	8.99	12.79
IQR	249.25	284.50
skewness	-0.15	0.13
kurtosis	-1.13	-1.26
0%	12.00	10.00
1%	16.57	13.41
5%	29.00	38.10
10%	60.00	57.20
20%	127.20	95.40
25%	148.25	113.75
30%	176.20	142.60
40%	237.80	193.40
50%	281.50	244.00
60%	326.00	295.60
70%	367.90	355.30
75%	397.50	398.25
80%	412.60	412.00
90%	464.60	472.00
95%	489.45	496.80
99%	501.43	507.59
100%	509.00	508.00

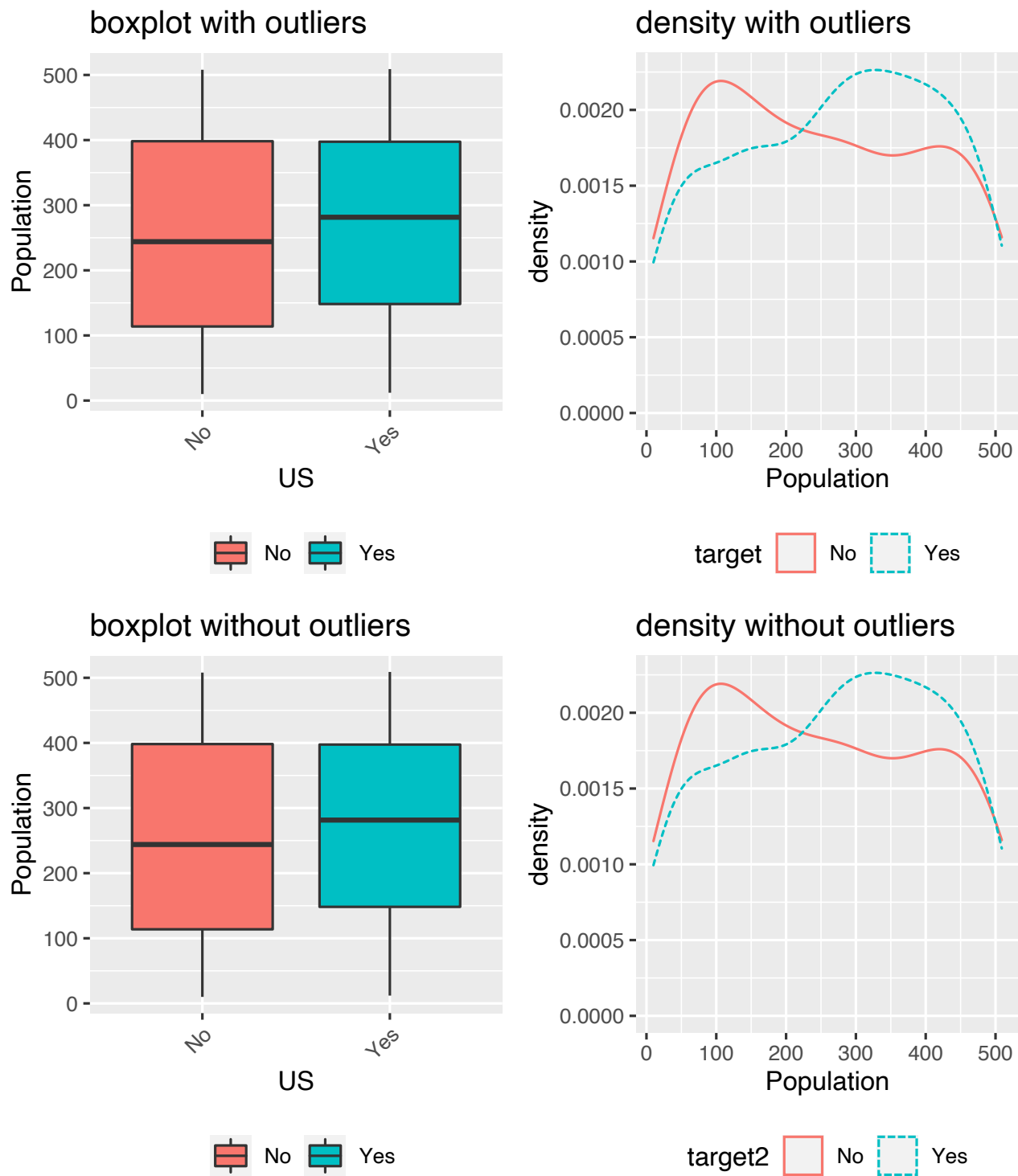


Figure 4.5: Population

**Price**

Table 4.6: Price

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	116.81	113.95
sd	22.59	25.51
se(mean)	1.41	2.14
IQR	30.00	31.75
skewness	0.09	-0.35
kurtosis	-0.03	0.83
0%	55.00	24.00
1%	70.00	50.64
5%	79.00	69.05
10%	87.70	86.30
20%	97.00	94.00
25%	101.00	98.00
30%	104.00	102.00
40%	110.00	108.00
50%	118.00	116.50
60%	123.20	121.60
70%	129.00	126.00
75%	131.00	129.75
80%	133.00	134.00
90%	147.00	144.00
95%	155.15	153.85
99%	168.15	165.18
100%	191.00	185.00

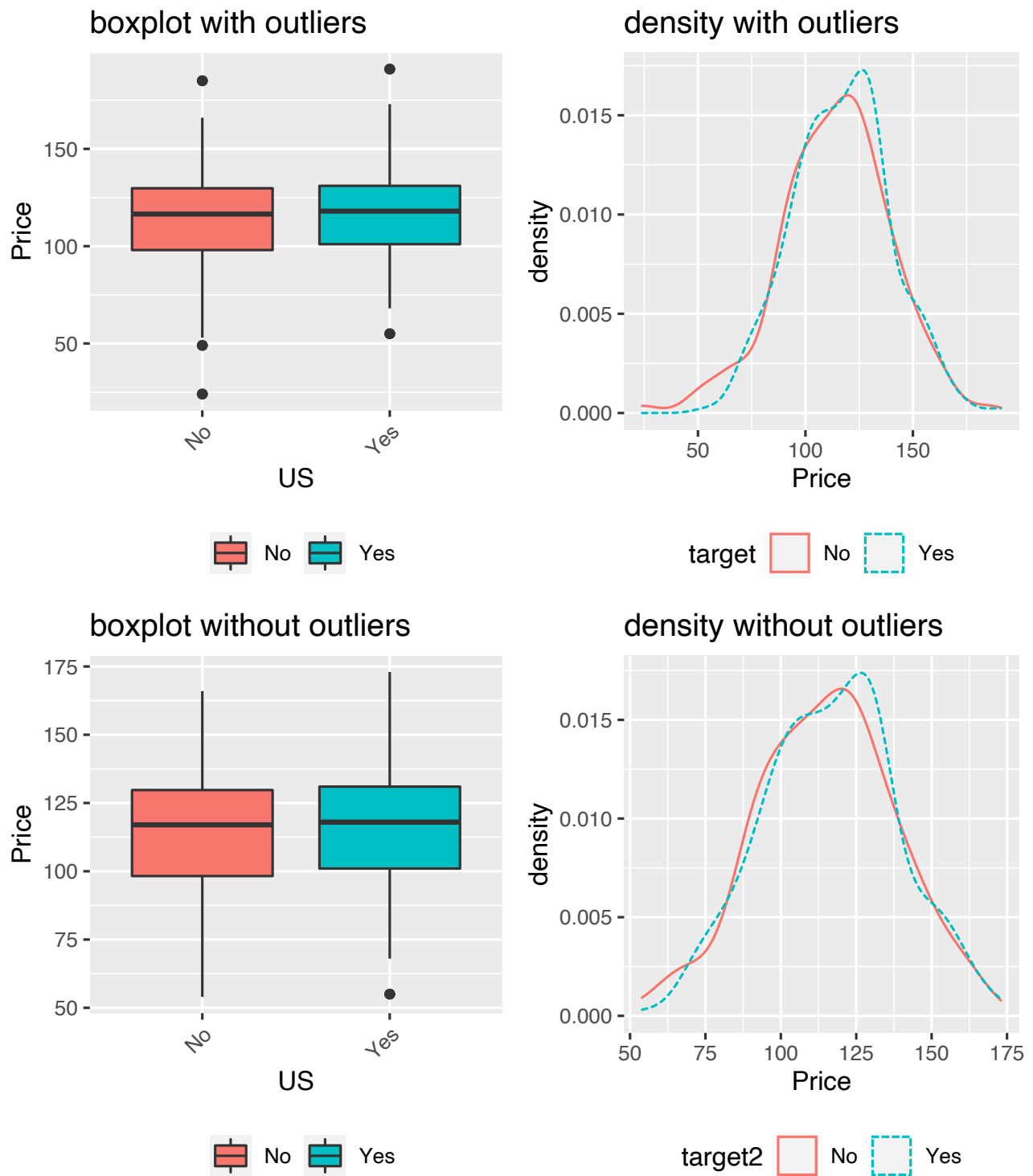


Figure 4.6: Price

**Age**

Table 4.7: Age

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	53.43	53.13
sd	15.57	17.34
se(mean)	0.97	1.46
IQR	24.75	27.75
skewness	-0.08	-0.06
kurtosis	-1.07	-1.26
0%	25.00	25.00
1%	25.00	25.00
5%	28.00	26.00
10%	31.70	28.10
20%	37.00	34.00
25%	41.25	38.00
30%	44.00	41.00
40%	49.00	46.80
50%	54.50	54.50
60%	59.00	60.60
70%	63.00	64.70
75%	66.00	65.75
80%	69.00	71.80
90%	74.30	76.00
95%	77.15	79.00
99%	80.00	80.00
100%	80.00	80.00

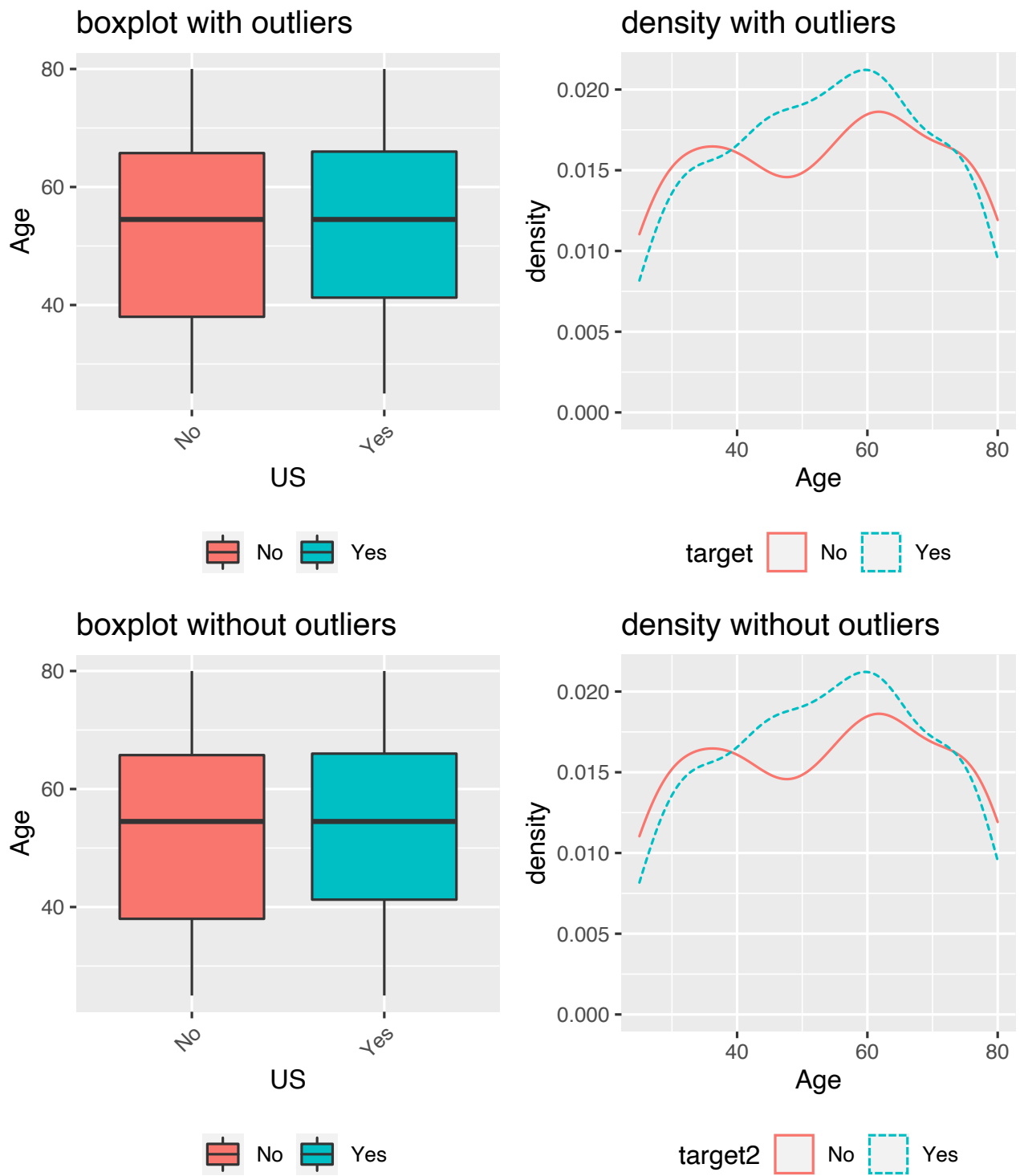


Figure 4.7: Age

**Education**

Table 4.8: Education

	Yes	No
n	258.00	142.00
NA	0.00	0.00
mean	13.75	14.18
sd	2.67	2.52
se(mean)	0.17	0.21
IQR	5.00	4.00
skewness	0.10	-0.04
kurtosis	-1.33	-1.23
0%	10.00	10.00
1%	10.00	10.00
5%	10.00	10.00
10%	10.00	11.00
20%	11.00	12.00
25%	11.00	12.00
30%	12.00	12.00
40%	13.00	13.00
50%	14.00	14.00
60%	15.00	15.00
70%	16.00	16.00
75%	16.00	16.00
80%	17.00	17.00
90%	17.00	18.00
95%	18.00	18.00
99%	18.00	18.00
100%	18.00	18.00

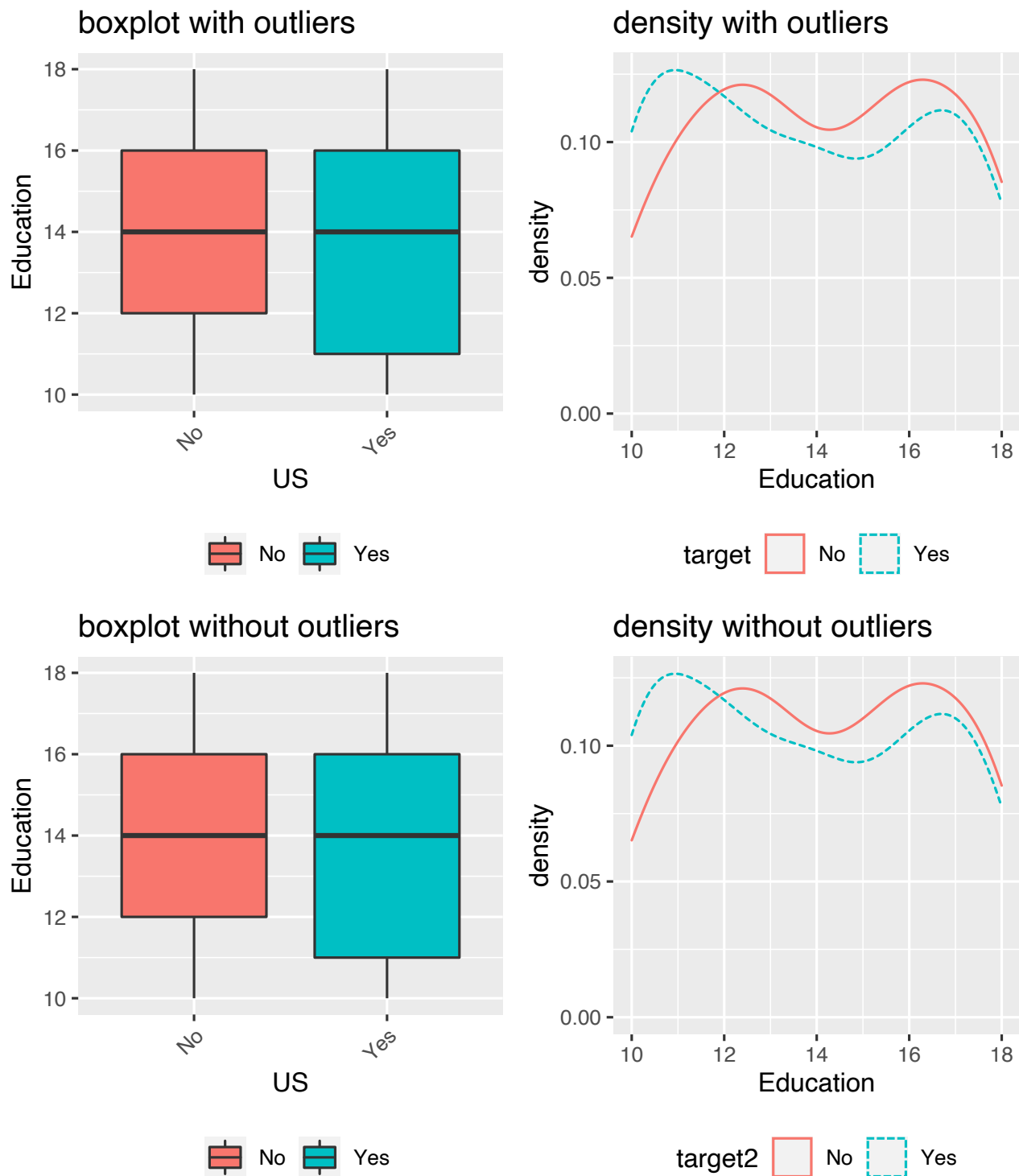


Figure 4.8: Education



## 4.1.2 Grouped Categorical Variables

ShelveLoc

	No	Yes	Sum
Bad	34	62	96
Good	24	61	85
Medium	84	135	219
<b>Sum</b>	<b>142</b>	<b>258</b>	<b>400</b>

	No	Yes	Sum
Bad	23.94	24.03	24.00
Good	16.90	23.64	21.25
Medium	59.15	52.33	54.75
<b>Sum</b>	<b>100.00</b>	<b>100.00</b>	<b>100.00</b>

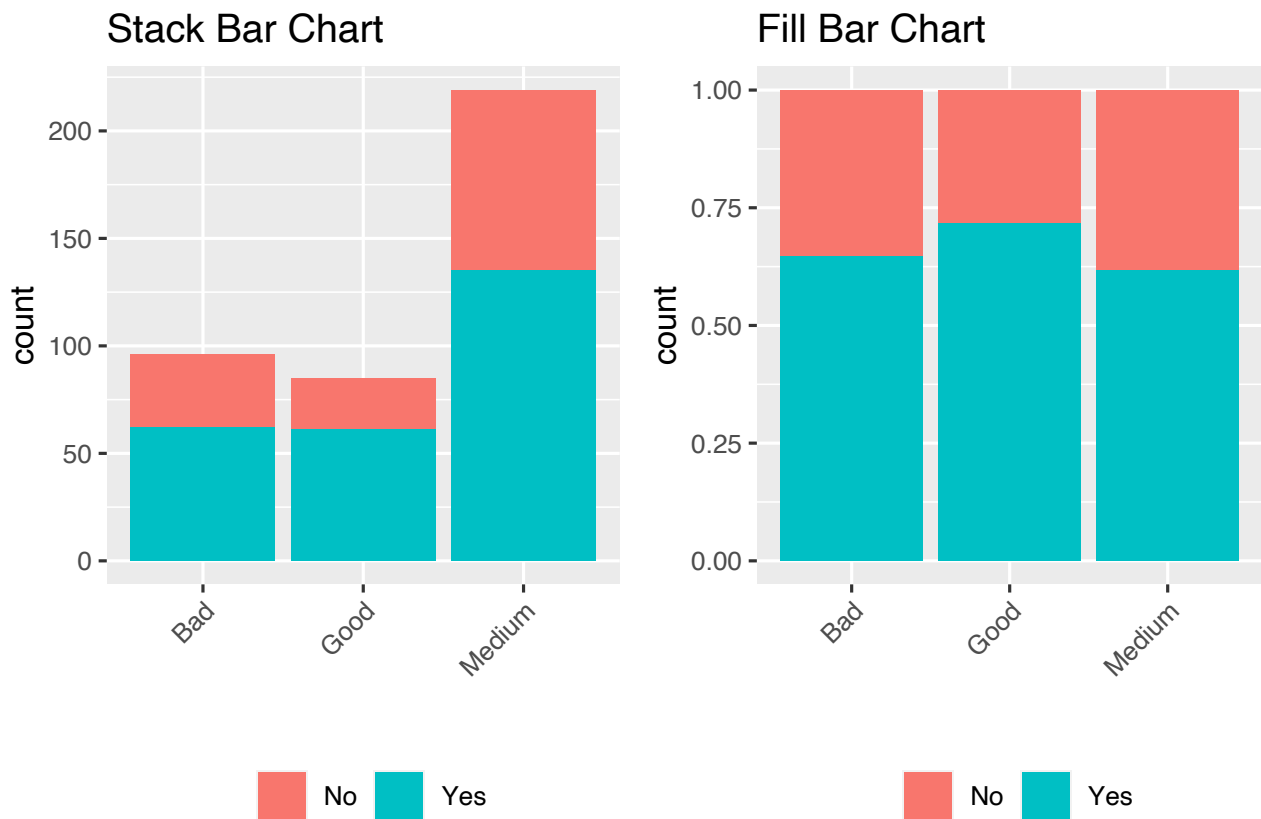


Figure 4.9: ShelveLoc

Urban

	No	Yes	Sum
No	46	71	117
Yes	96	182	278
NA	0	5	5
Sum	142	258	400

	No	Yes	Sum
No	32.39	27.52	29.25
Yes	67.61	70.54	69.50
NA	0.00	1.94	1.25
Sum	100.00	100.00	100.00

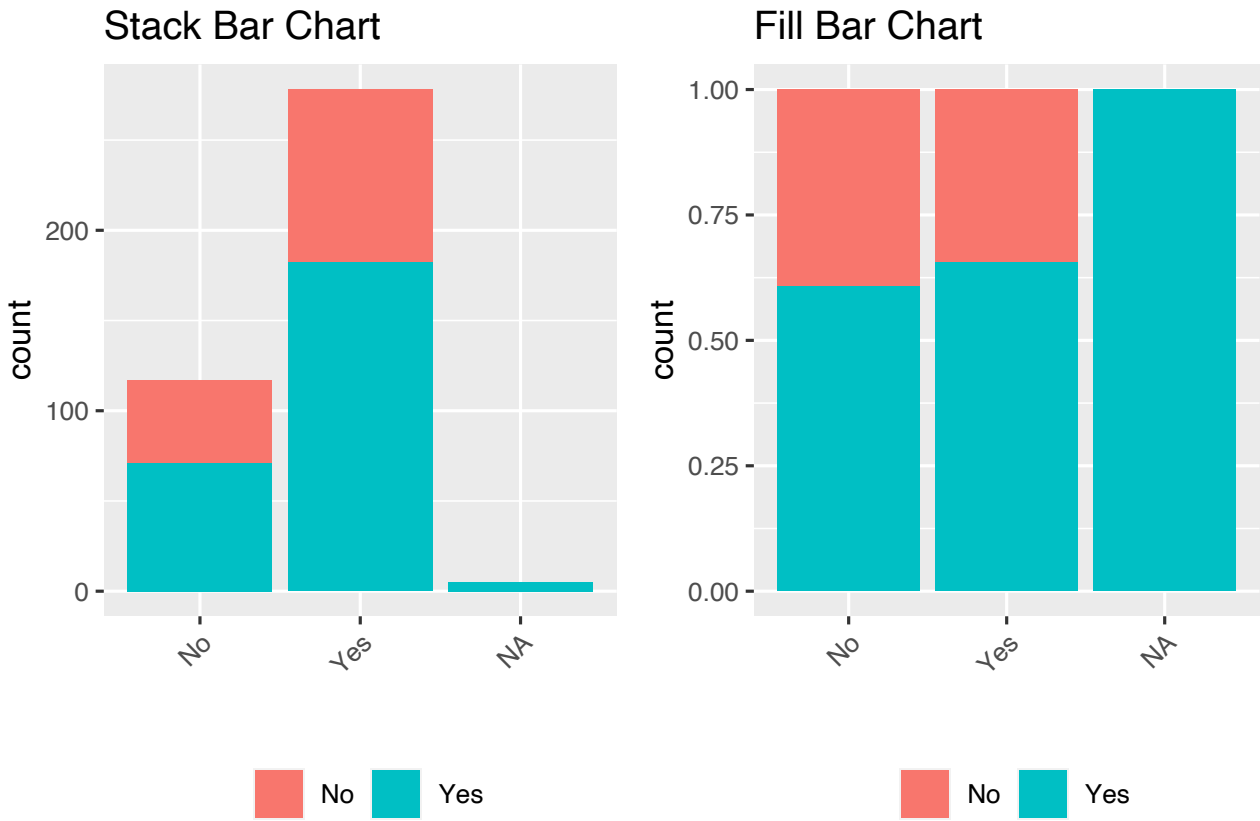


Figure 4.10: Urban

## 4.2 Grouped Relationship Between Variables

### 4.2.1 Grouped Correlation Coefficient

Table 4.9: The correlation coefficients (0.5 or more)

US	Variable1	Variable2	Correlation Coefficient
No	Price	CompPrice	0.638
No	Price	Sales	-0.529
Yes	Price	CompPrice	0.550

### 4.2.2 Grouped Correlation Plot of Numerical Variables

- Grouped Correlation Case of (US == No)

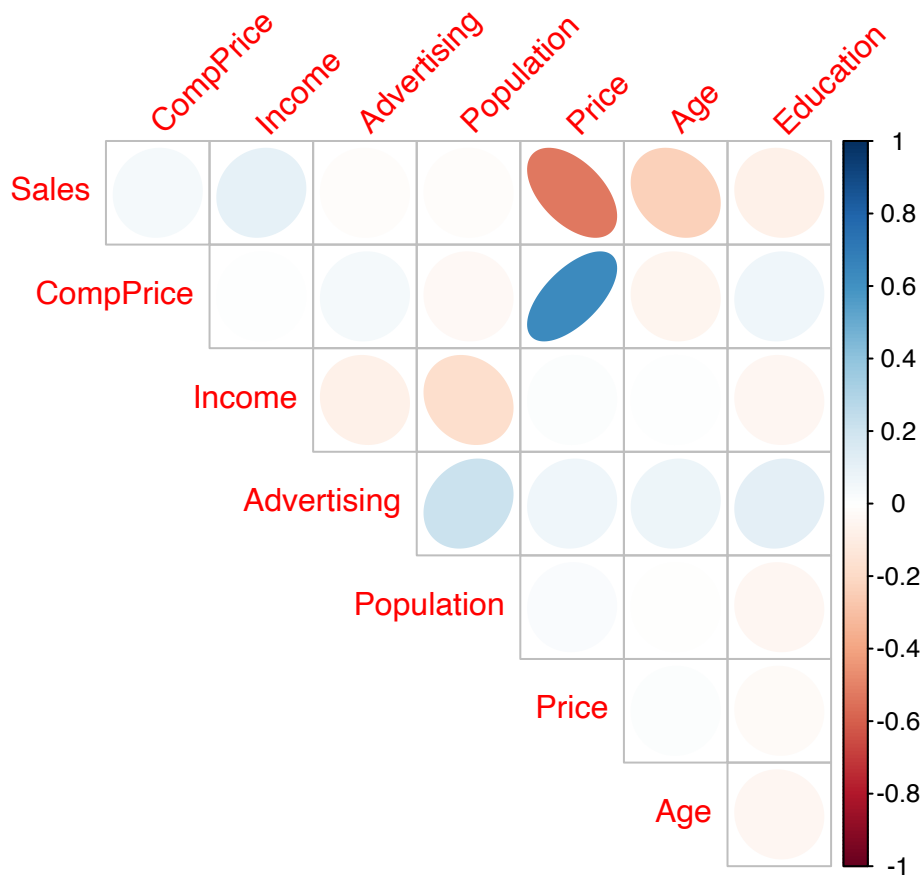


Figure 4.11: Correlation Matrix Plot (US == No)

- Grouped Correlation Case of (US == Yes)

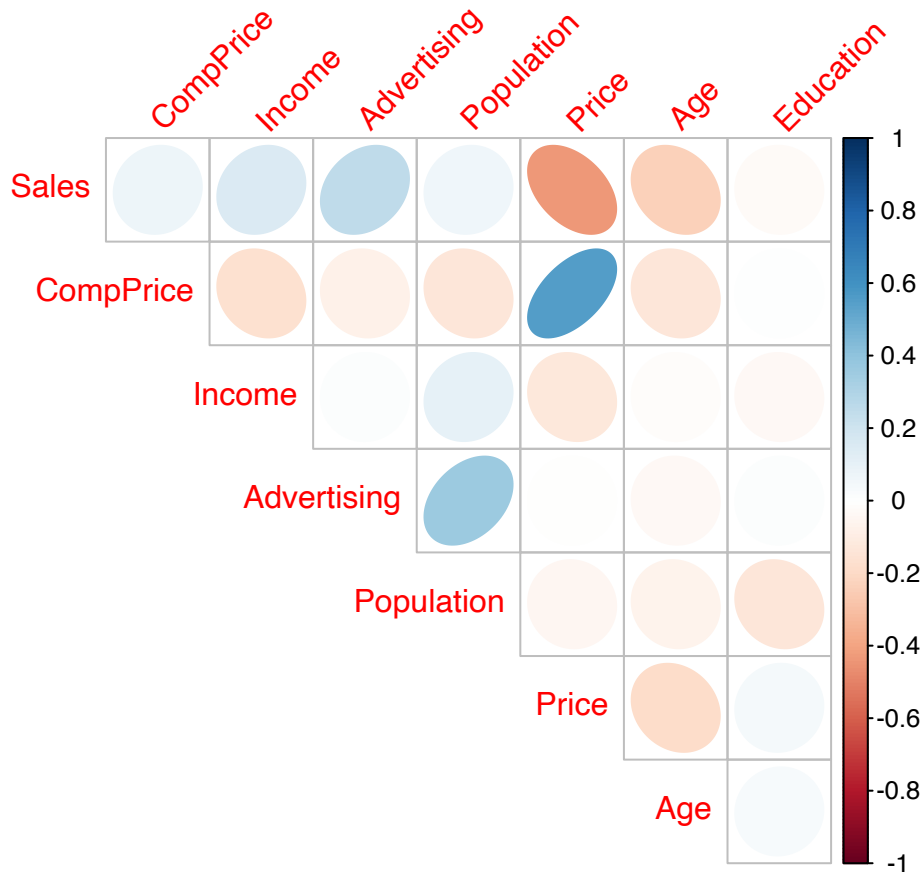


Figure 4.12: Correlation Matrix Plot (US == Yes)