REPORT SERIES WITH DLOOKR

Exploratory Data Analysis Report

Author:
dlookr package

Version:
0.3.12

August 3, 2020

Contents

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

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
```

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

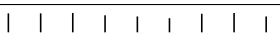
Value	Bad	Good	Medium
Frequency	96	85	219
Proportion	0.240	0.212	0.547

Age

n	missing	distinct	Info	Mean	Gmd	.05	.10	.25	.50	.75	.90	.95
400	0	56	1	53.32	18.71	27.00	30.00	39.75	54.50	66.00	76.00	79.00

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

Education



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

Urban

n	missing	distinct
395	5	2

Value	No	Yes
Frequency	117	278
Proportion	0.296	0.704

US

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

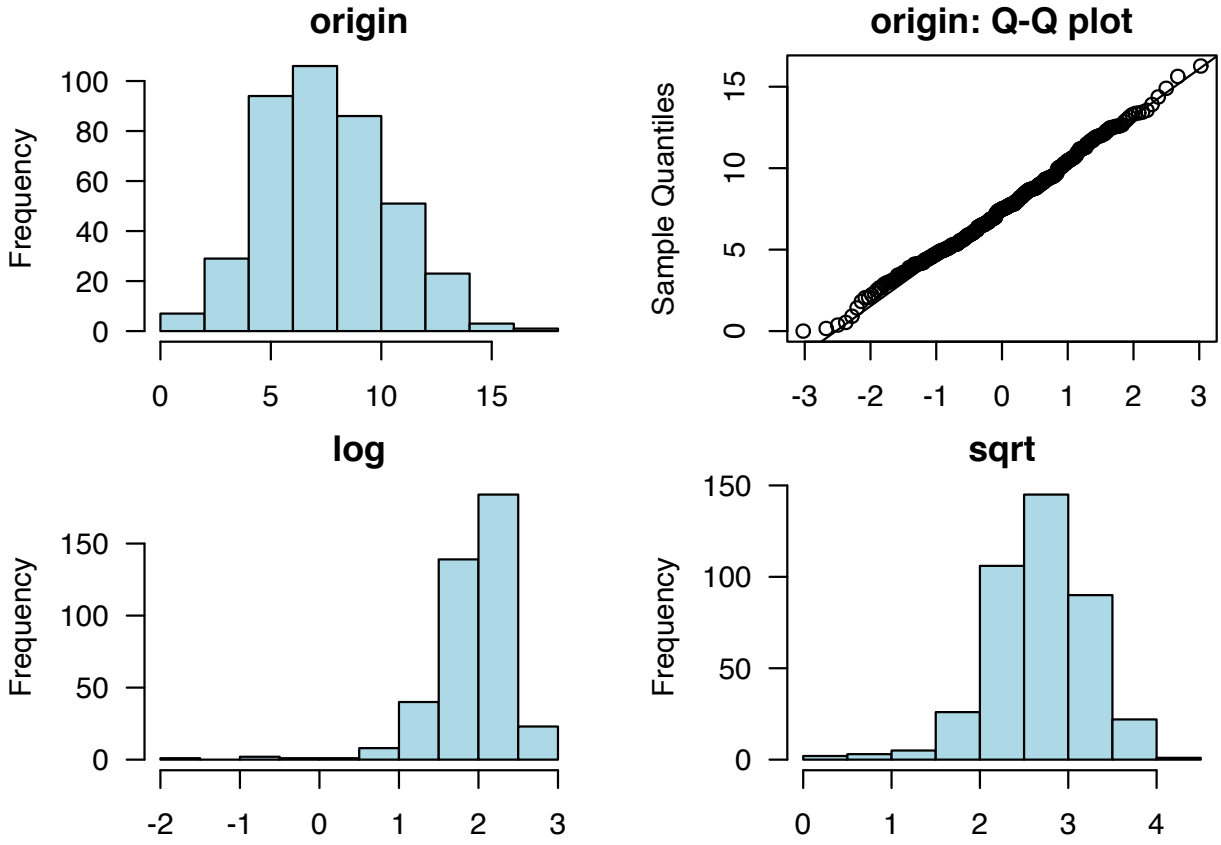


Figure 2.1: Sales

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

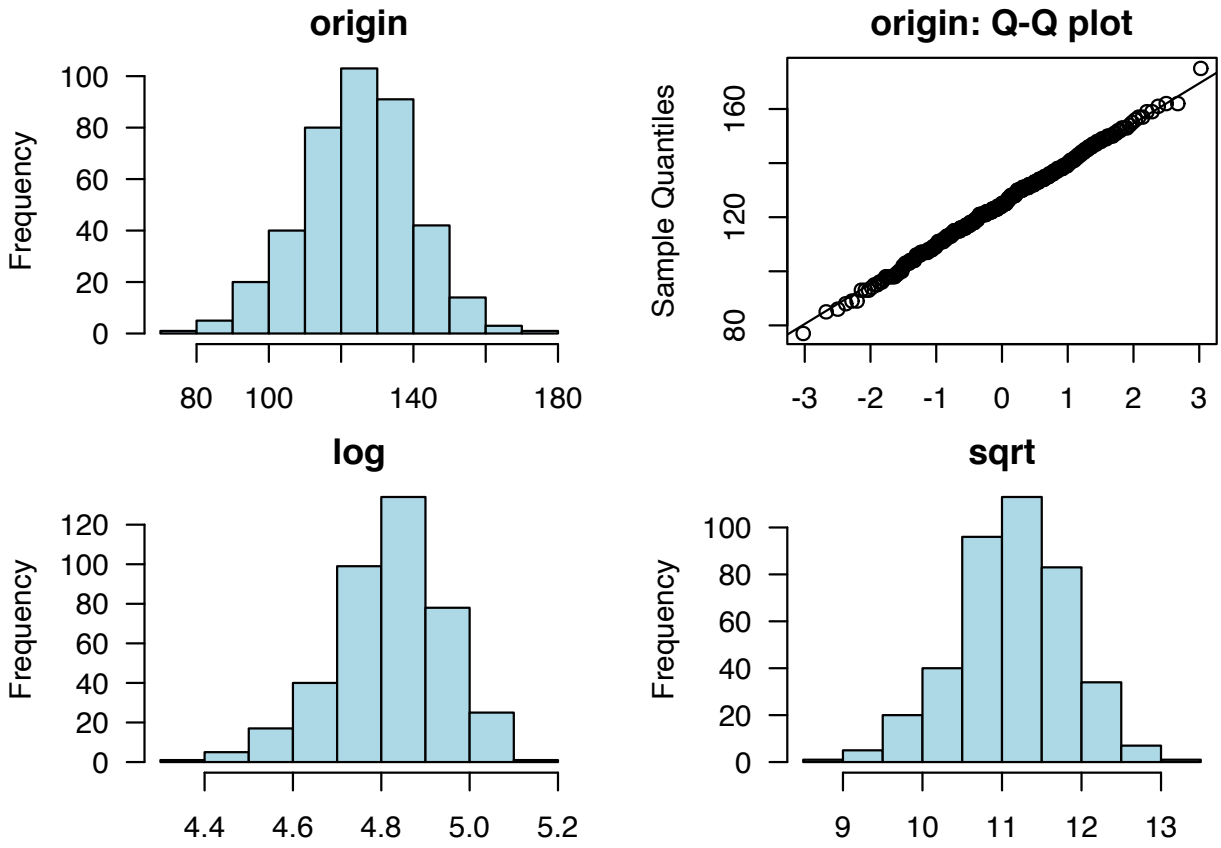


Figure 2.2: CompPrice

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

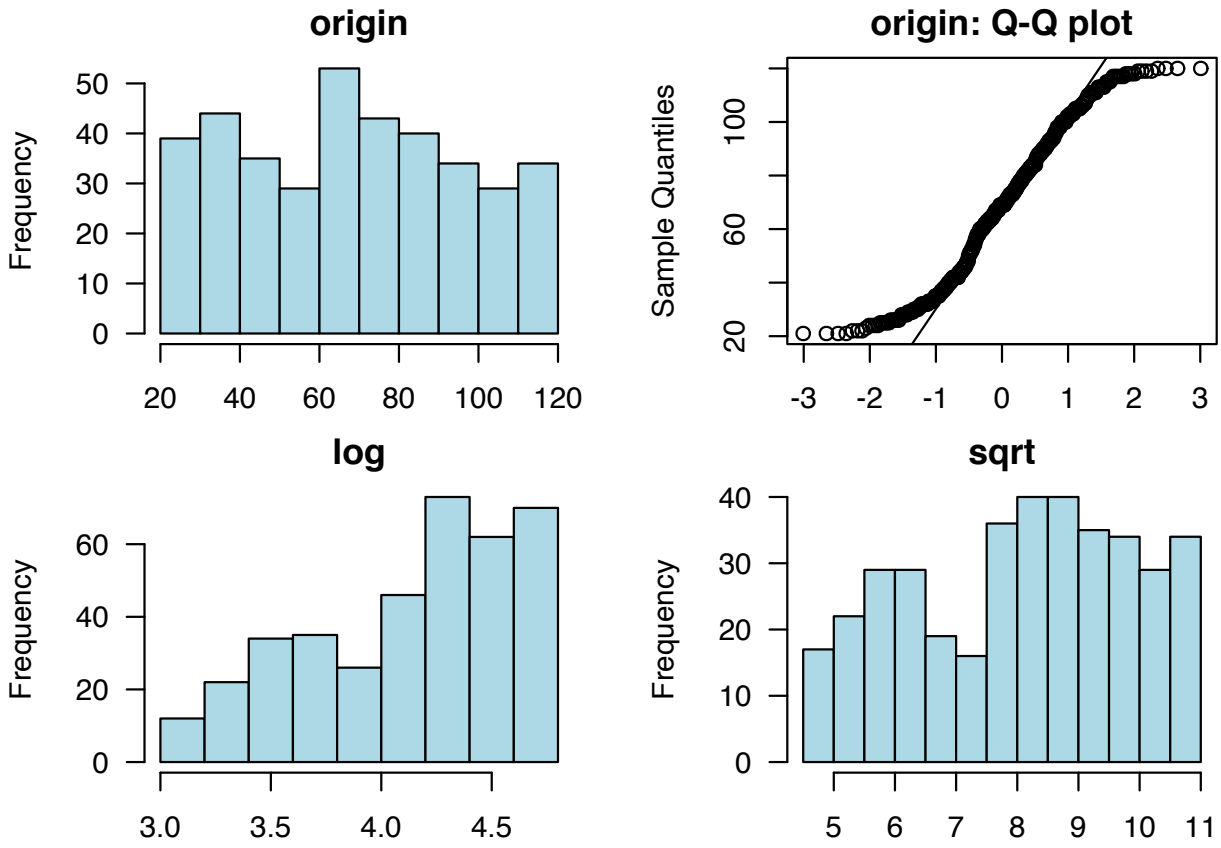


Figure 2.3: Income

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

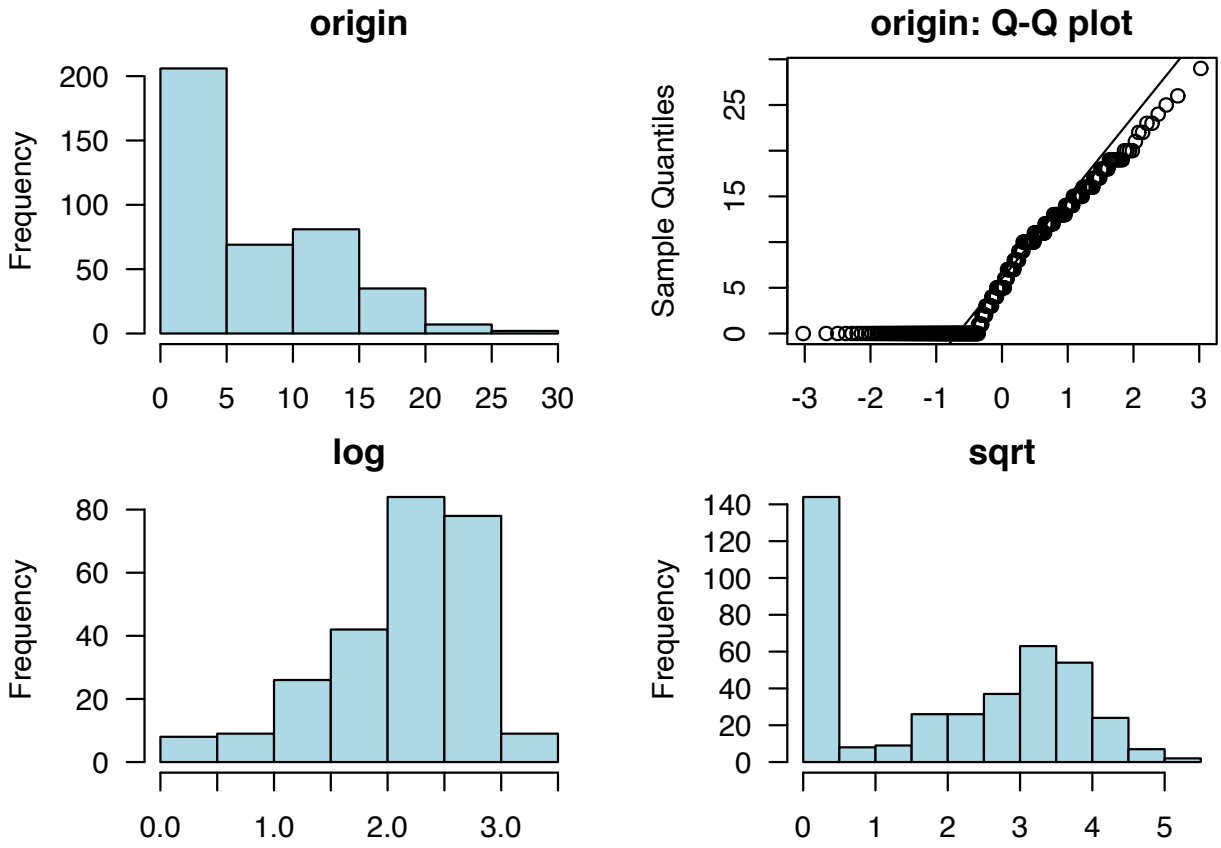


Figure 2.4: Advertising

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

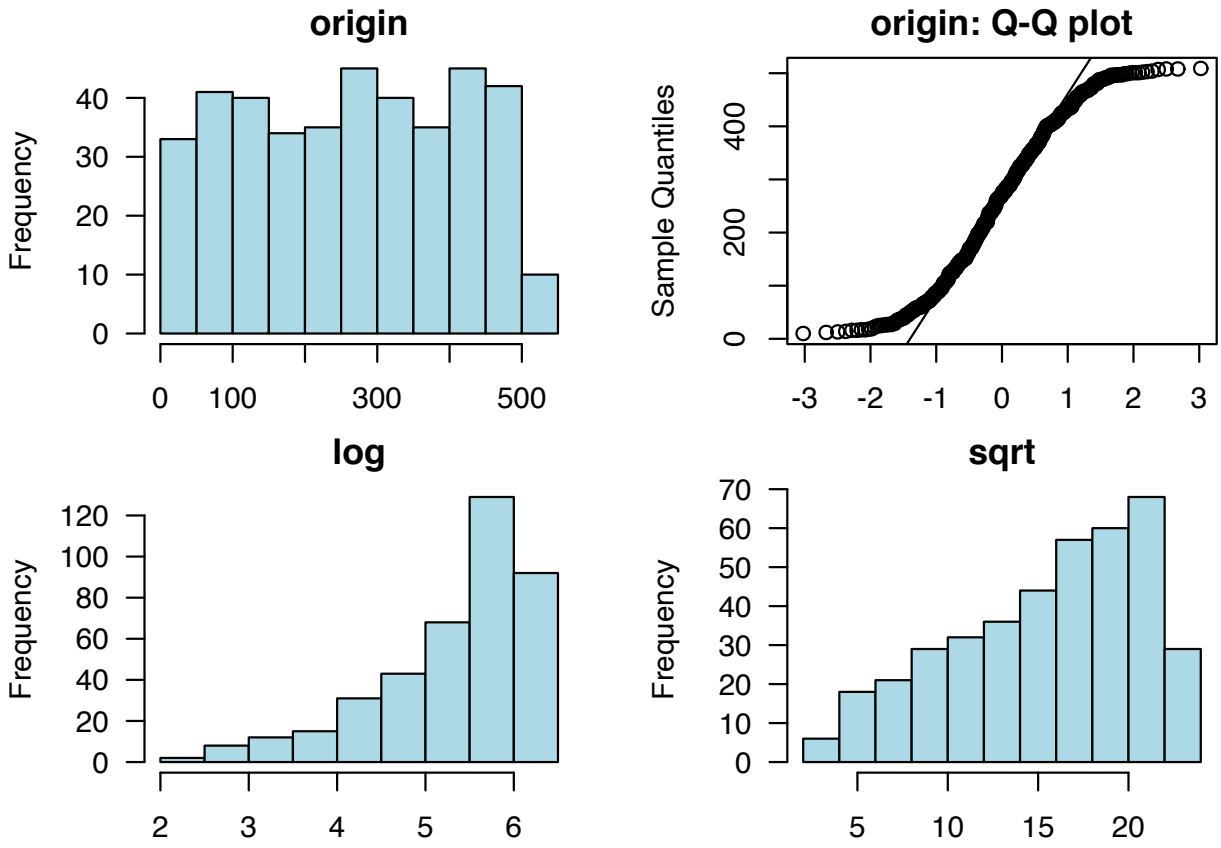


Figure 2.5: Population

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

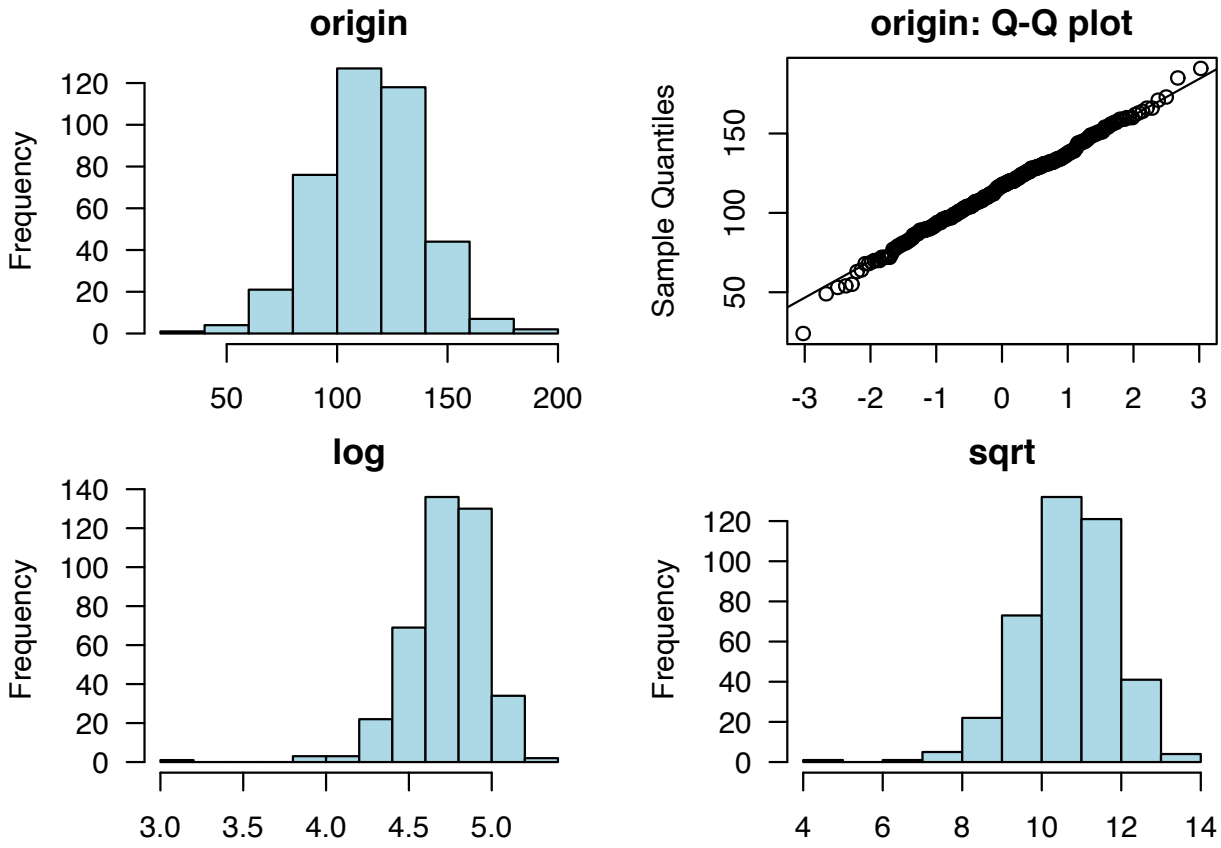


Figure 2.6: Price

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

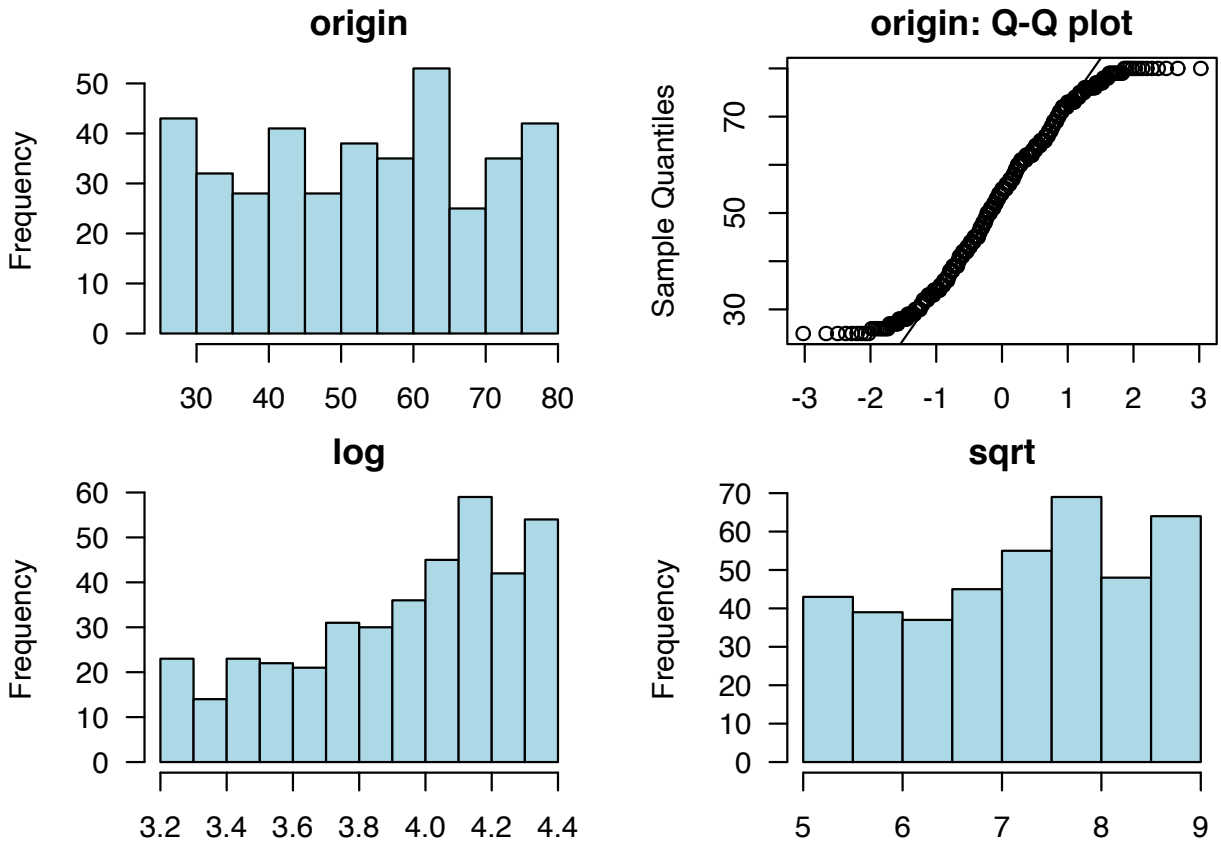


Figure 2.7: Age

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

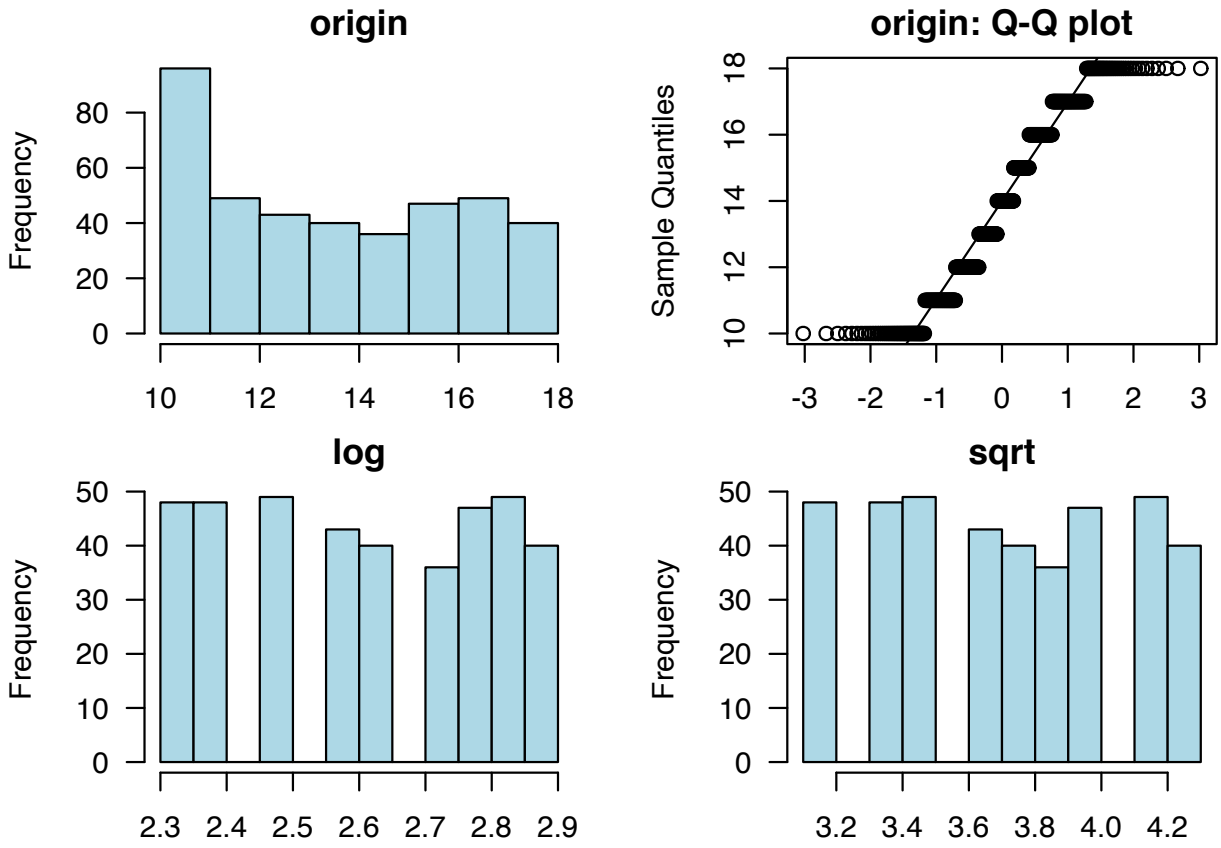


Figure 2.8: Education

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

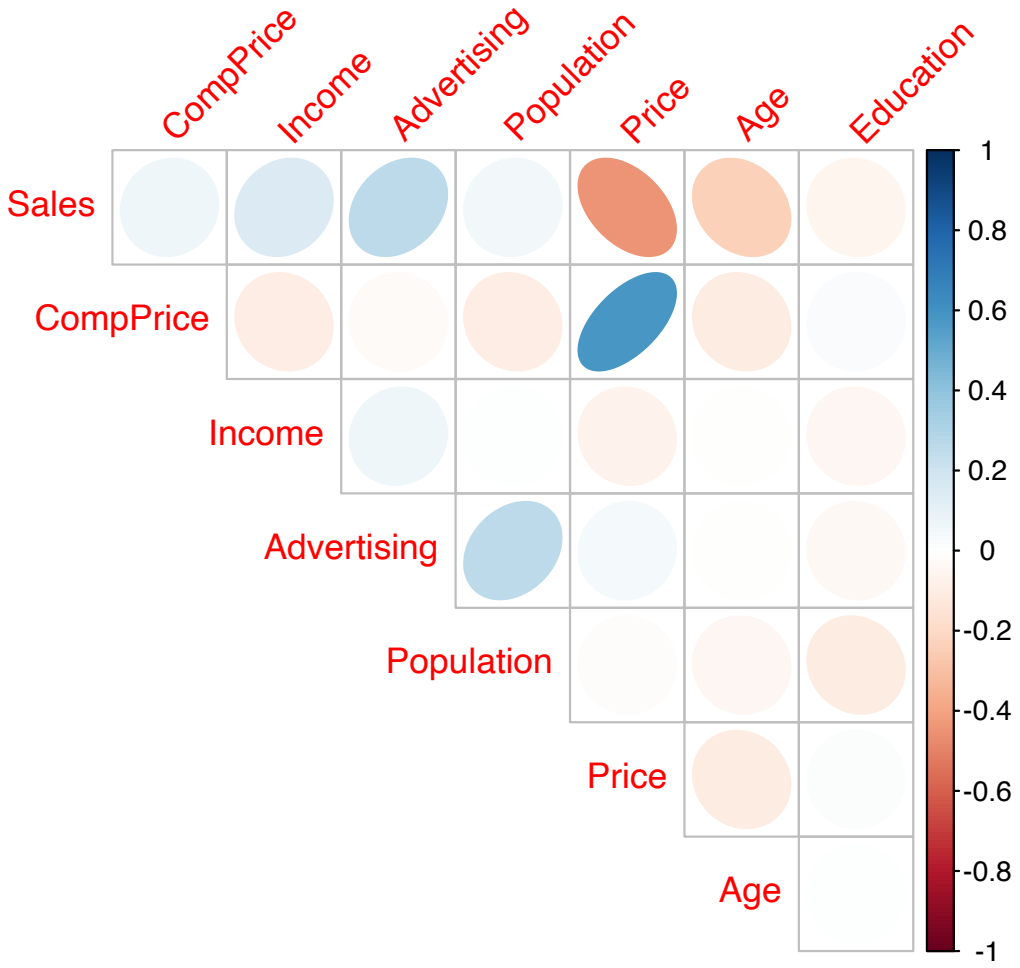


Figure 3.1: The correlation coefficient of numerical variables

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

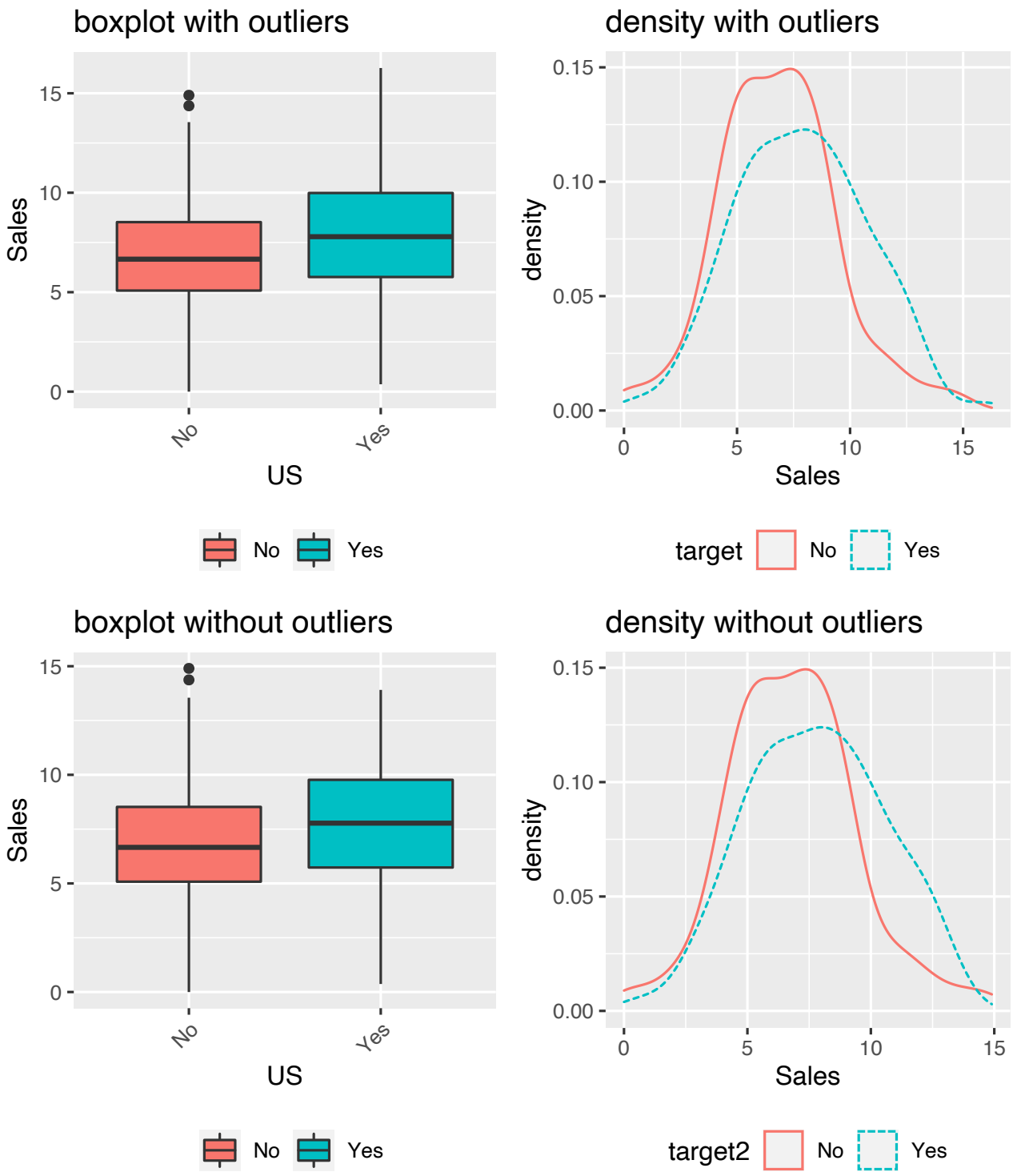


Figure 4.1: Sales

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

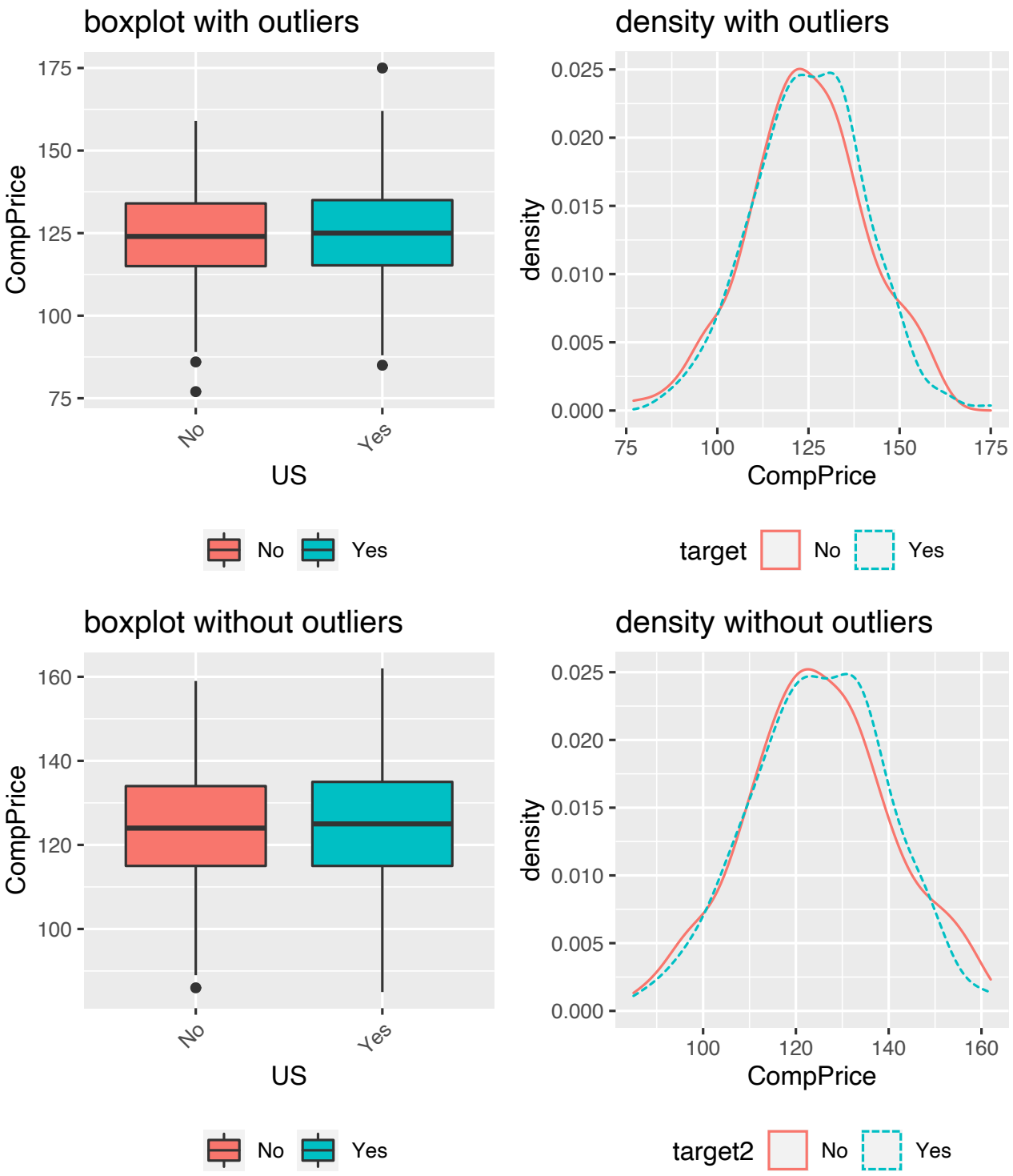


Figure 4.2: CompPrice

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

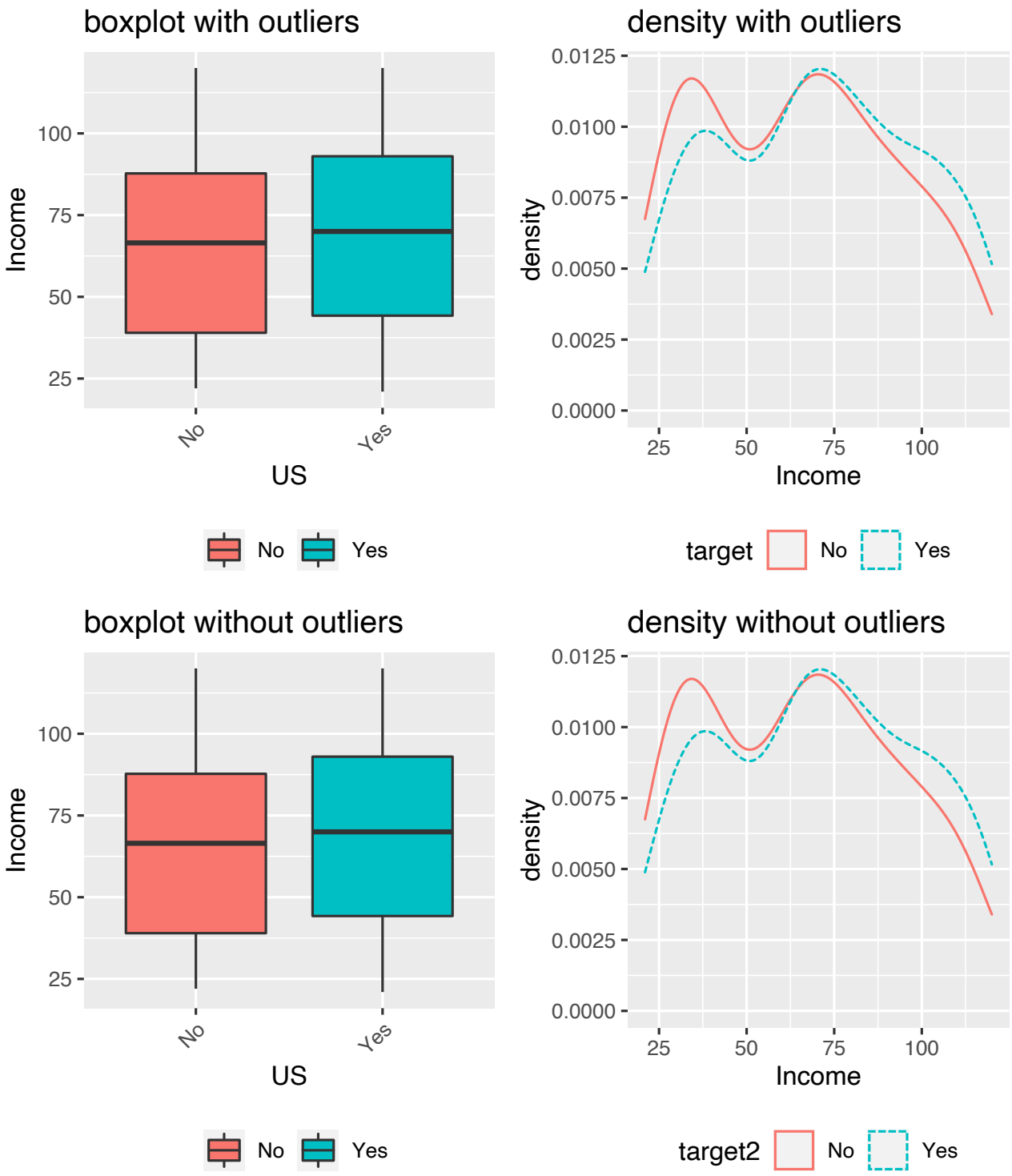


Figure 4.3: Income

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

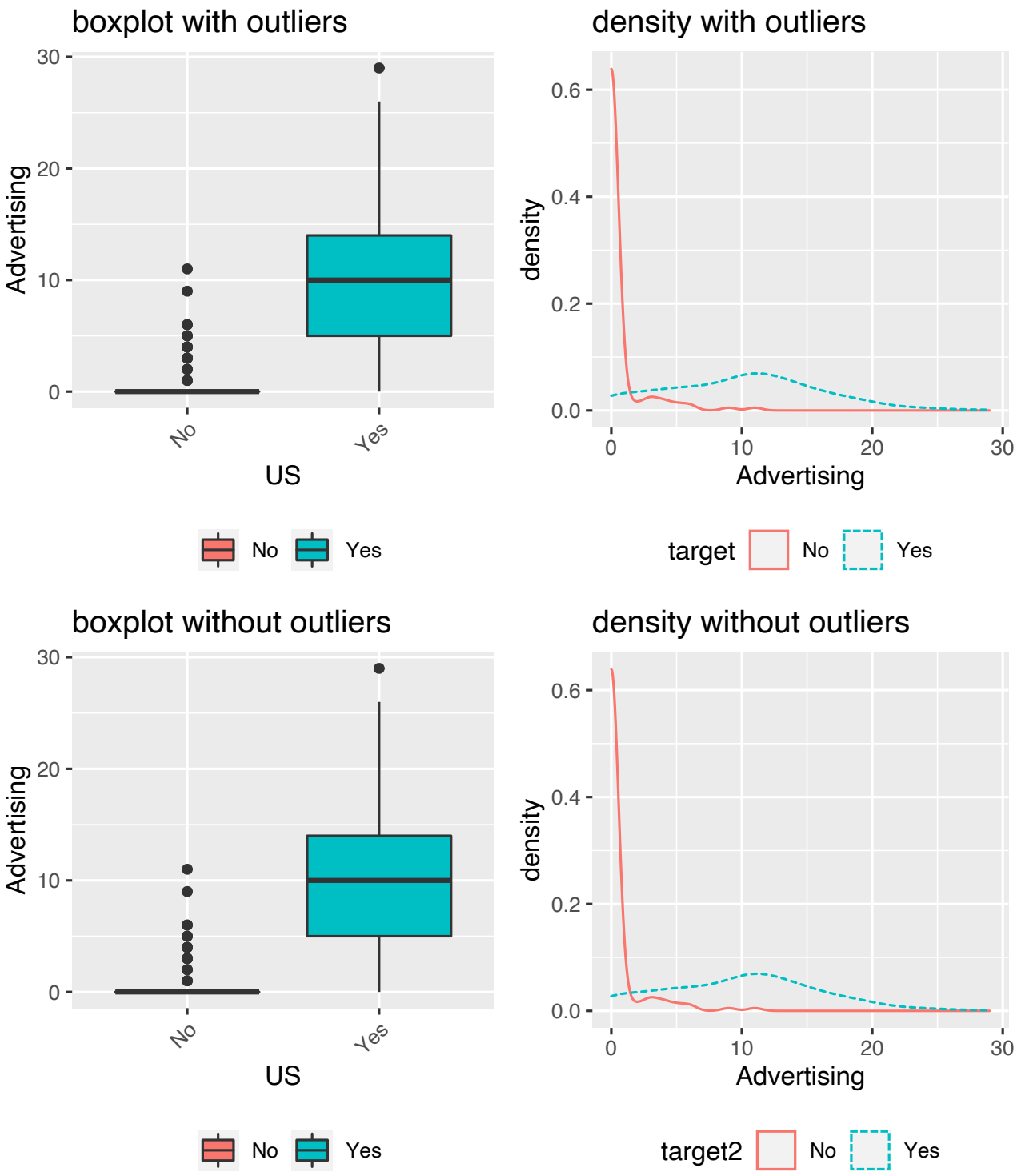


Figure 4.4: Advertising

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

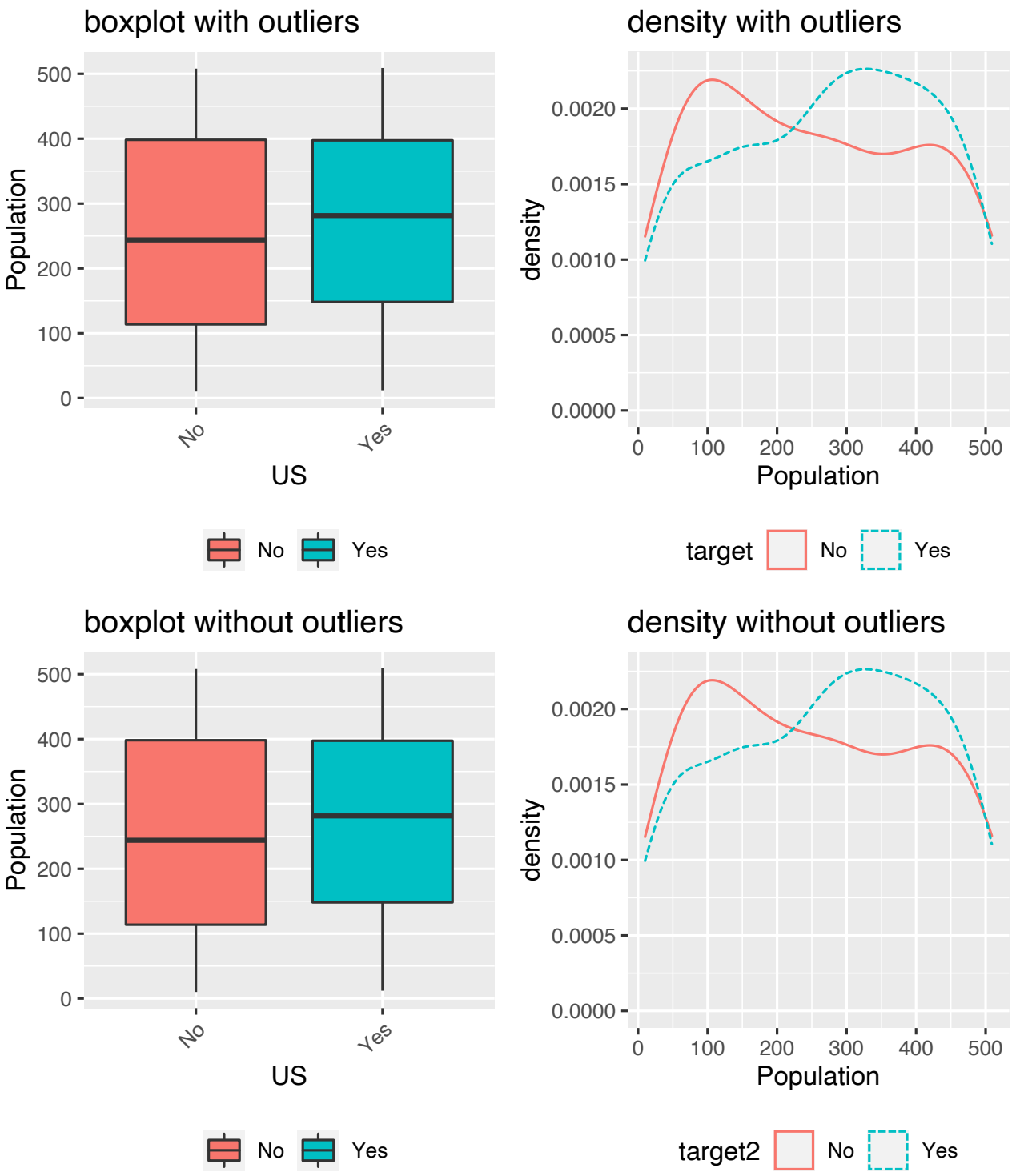


Figure 4.5: Population

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

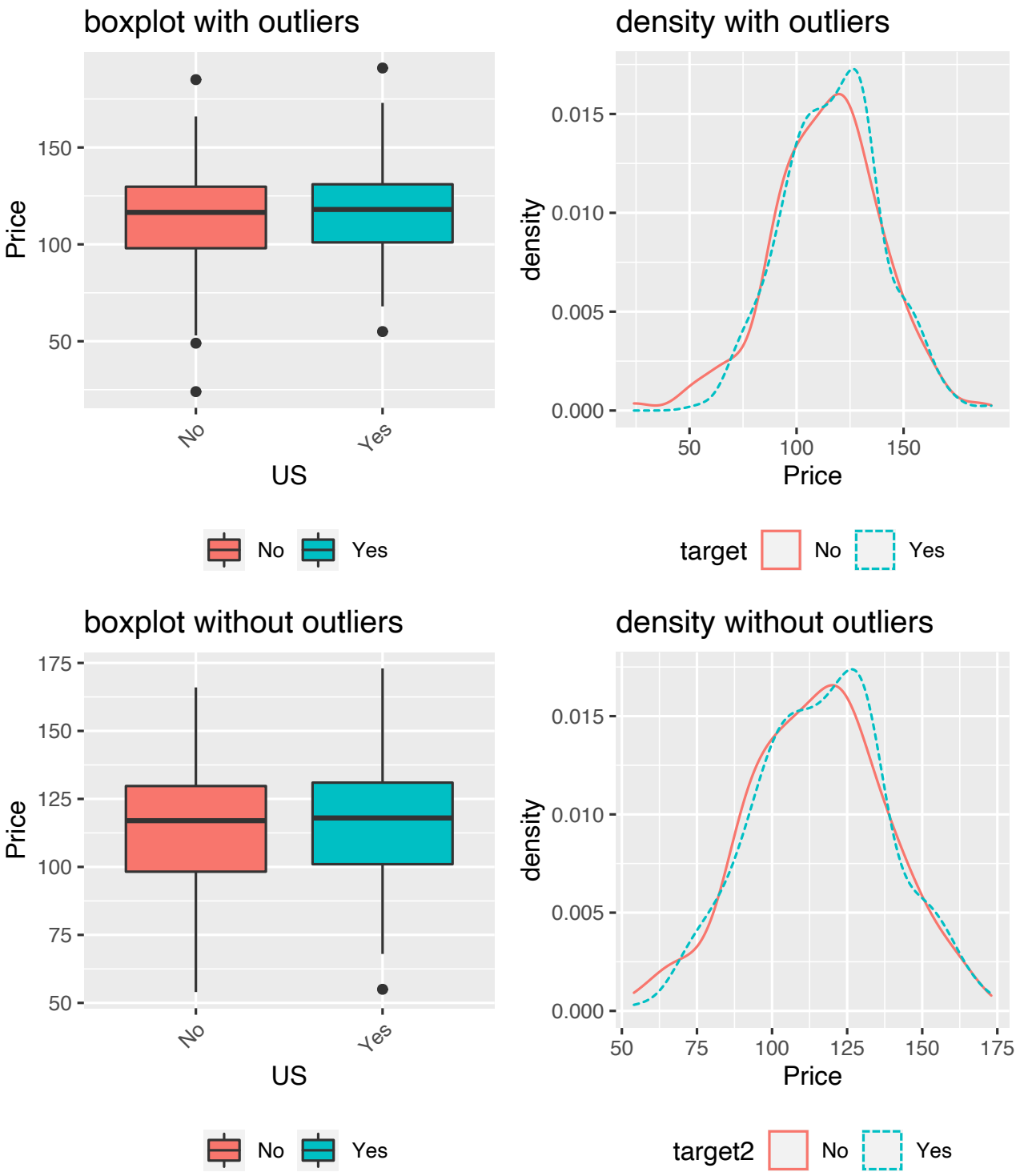


Figure 4.6: Price

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

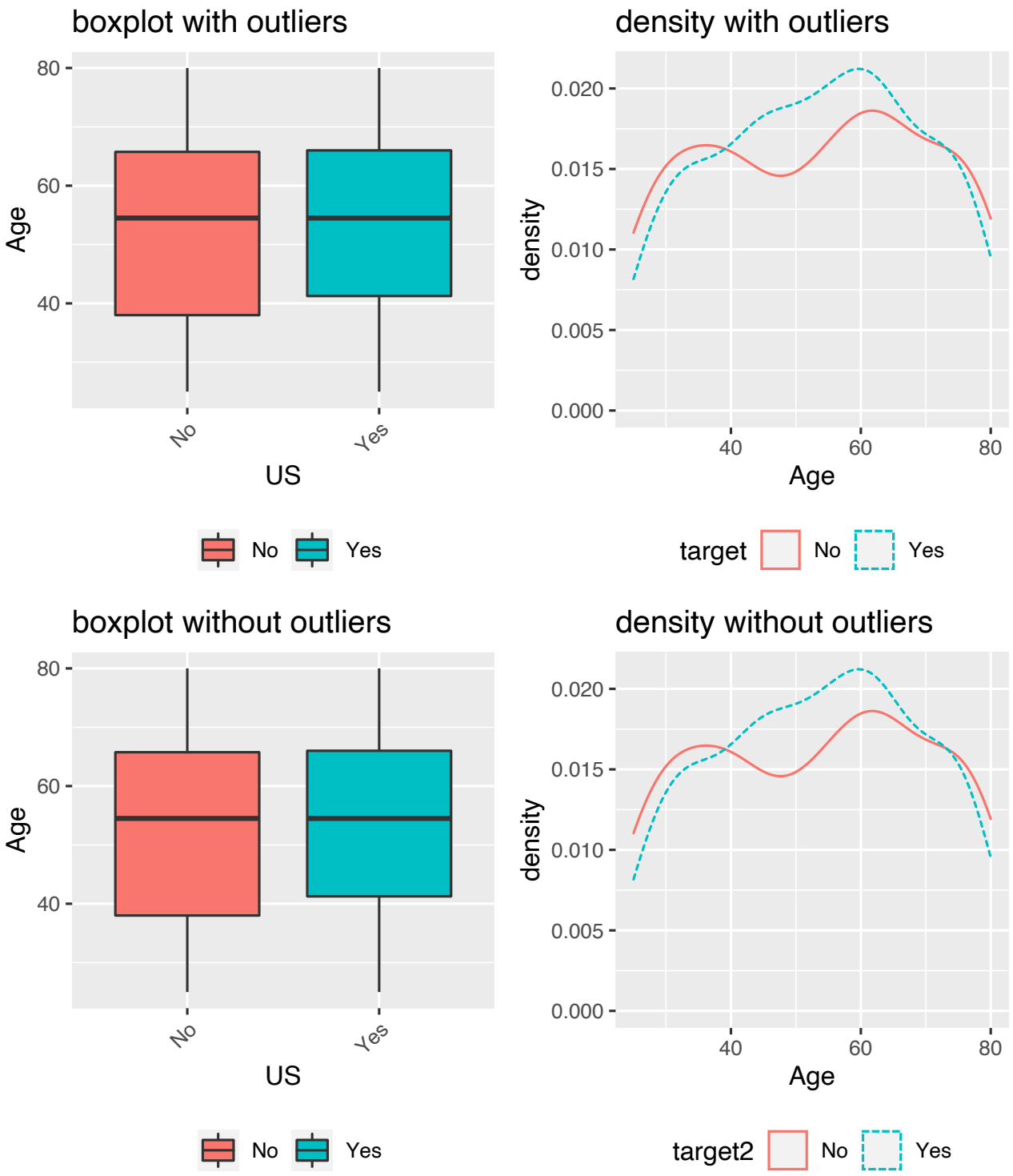


Figure 4.7: Age

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

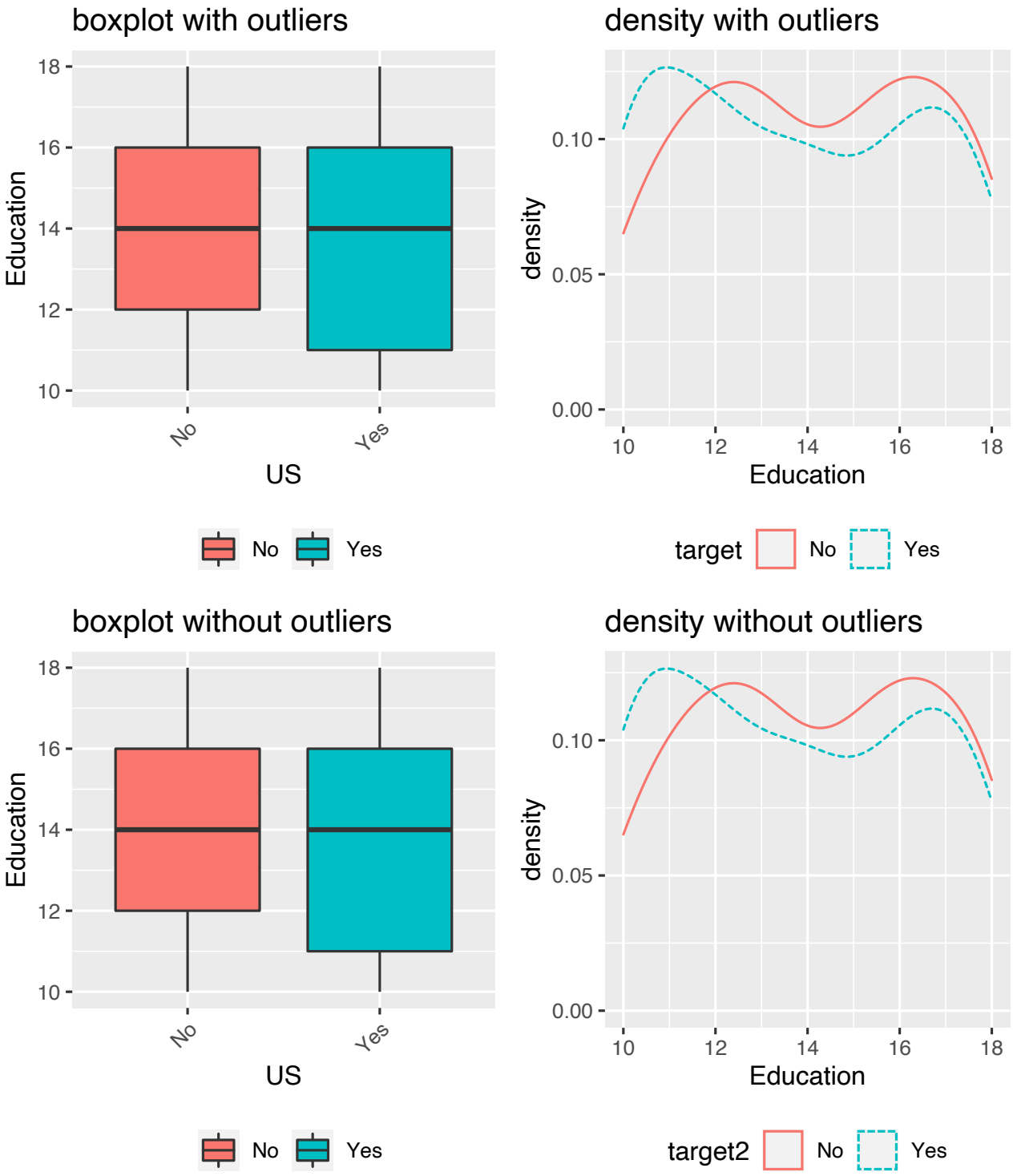


Figure 4.8: Education

4.1.2 Grouped Categorical Variables

ShelveLoc

	No	Yes	Sum
Bad	34	62	96
Good	24	61	85
Medium	84	135	219
Sum	**142**	**258**	**400**

	No	Yes	Sum
Bad	23.94	24.03	24.00
Good	16.90	23.64	21.25
Medium	59.15	52.33	54.75
Sum	**100.00**	**100.00**	**100.00**

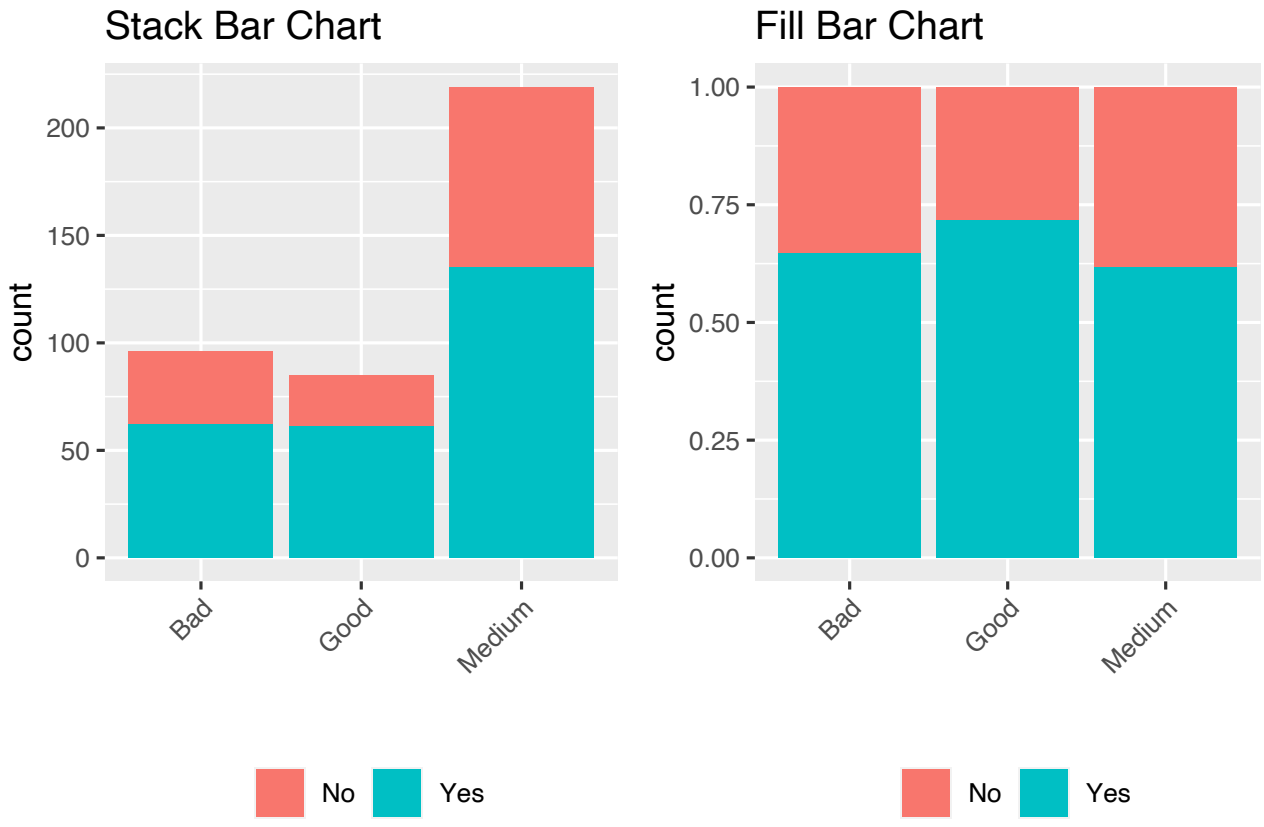


Figure 4.9: ShelveLoc

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**

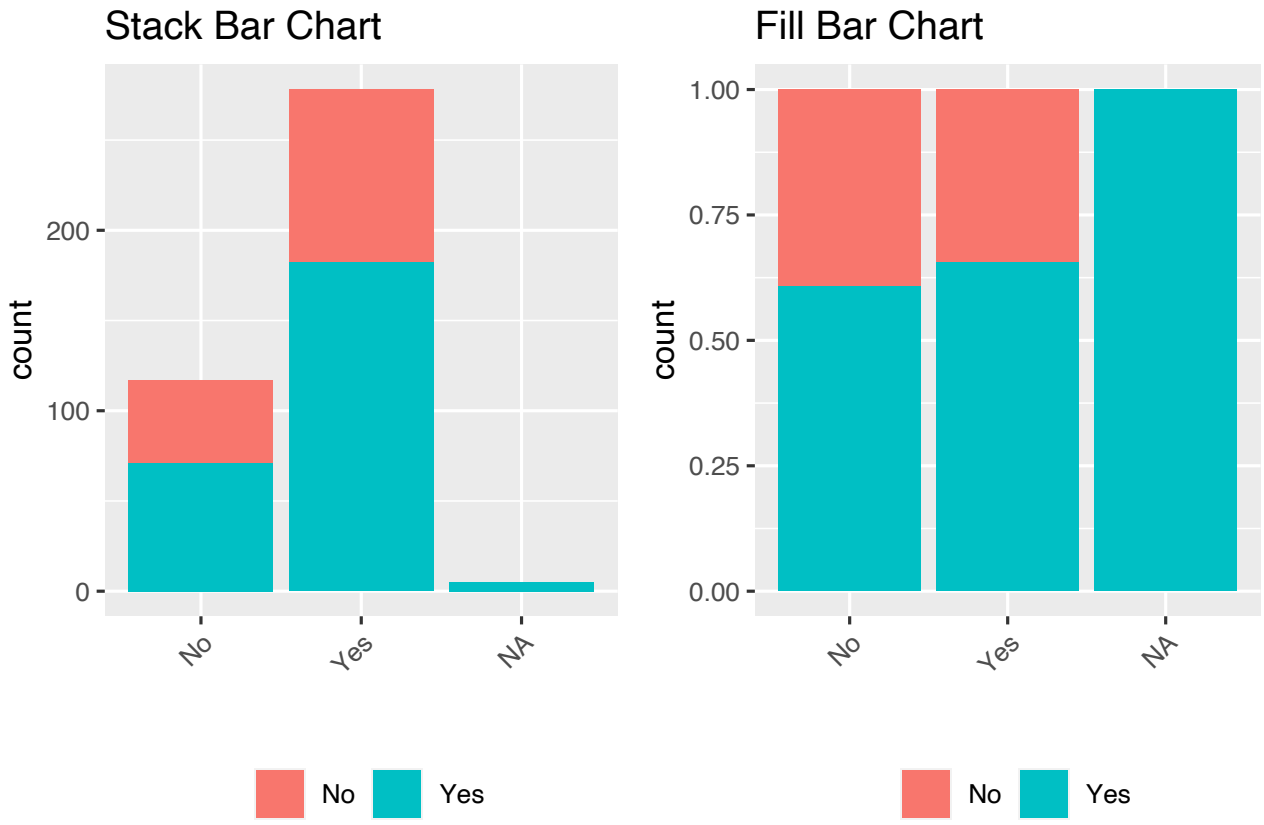


Figure 4.10: Urban

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)

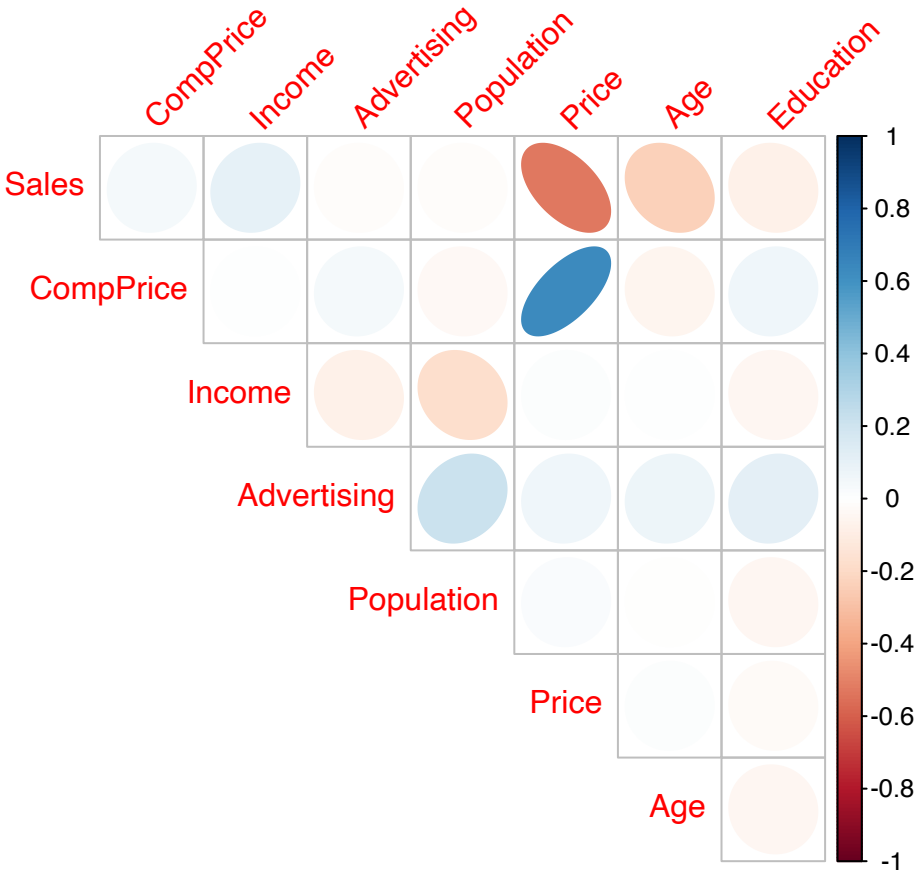


Figure 4.11: Correlation Matrix Plot (US == No)

- Grouped Correlation Case of (US == Yes)

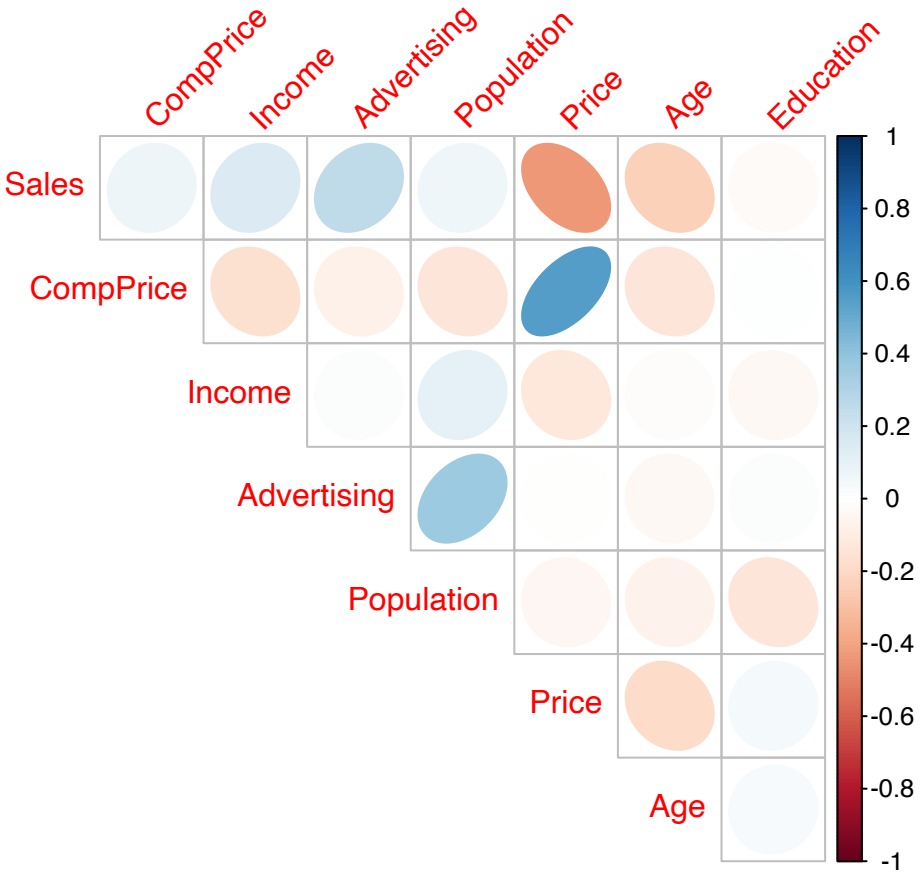


Figure 4.12: Correlation Matrix Plot (US == Yes)