

The Caravan Data

Contents

1 Load the Data

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1 Load the Data

```
library(ISLR2)
names(Caravan)
```

```
## [1] "MOSTYPE" "MAANTHUI" "MGEMOMV" "MGEMLEEF" "MOSHOOFD" "MGODRK"
## [7] "MGODPR" "MGODOV" "MGODGE" "MRELGE" "MRELSA" "MRELOV"
## [13] "MFALLEEN" "MFGEKIND" "MFWEKIND" "MOPLHOOG" "MOPLMIDD" "MOPLLAAG"
## [19] "MBERHOOG" "MBERZELF" "MBERBOER" "MBERMIDD" "MBERARBG" "MBERARBO"
## [25] "MSKA" "MSKB1" "MSKB2" "MSKC" "MSKD" "MHHUUR"
## [31] "MHKOOP" "MAUT1" "MAUT2" "MAUTO" "MZFONDS" "MZPART"
## [37] "MINKM30" "MINK3045" "MINK4575" "MINK7512" "MINK123M" "MINKGEM"
## [43] "MKOOPKLA" "PWAPART" "PWABEDR" "PWALAND" "PPERSAUT" "PBESAUT"
## [49] "PMOTSCO" "PVRAAUT" "PAANHANG" "PTRACTOR" "PWERKT" "PBROM"
## [55] "PLEVEN" "PPERSONG" "PGEZONG" "PWAOREG" "PBRAND" "PZEILPL"
## [61] "PPLEZIER" "PFIETS" "PINBOED" "PBYSTAND" "AWAPART" "AWABEDR"
## [67] "AWALAND" "APERSAUT" "ABESAUT" "AMOTSCO" "AVRAAUT" "AAANHANG"
## [73] "ATTRACTOR" "AWERKT" "ABROM" "ALEVEN" "APERSONG" "AGEZONG"
## [79] "AWAOREG" "ABRAND" "AZEILPL" "APLEZIER" "AFIETS" "AINBOED"
## [85] "ABYSTAND" "Purchase"
```

```
summary(Caravan)
```

```
##      MOSTYPE      MAANTHUI      MGEMOMV      MGEMLEEF
## Min.   : 1.00   Min.   : 1.000   Min.   :1.000   Min.   :1.000
## 1st Qu.:10.00   1st Qu.: 1.000   1st Qu.:2.000   1st Qu.:2.000
## Median :30.00   Median : 1.000   Median :3.000   Median :3.000
## Mean   :24.25   Mean    : 1.111   Mean    :2.679   Mean    :2.991
## 3rd Qu.:35.00   3rd Qu.: 1.000   3rd Qu.:3.000   3rd Qu.:3.000
## Max.   :41.00   Max.    :10.000   Max.    :5.000   Max.    :6.000
##      MOSHOOFD      MGODRK      MGODPR      MGODOV
## Min.   : 1.000   Min.   :0.0000   Min.   :0.000   Min.   :0.00
## 1st Qu.: 3.000   1st Qu.:0.0000   1st Qu.:4.000   1st Qu.:0.00
## Median : 7.000   Median :0.0000   Median :5.000   Median :1.00
## Mean   : 5.774   Mean    :0.6965   Mean    :4.627   Mean    :1.07
## 3rd Qu.: 8.000   3rd Qu.:1.0000   3rd Qu.:6.000   3rd Qu.:2.00
## Max.   :10.000   Max.    :9.0000   Max.    :9.000   Max.    :5.00
##      MGODGE      MRELGE      MRELSA      MRELOV
## Min.   :0.000   Min.   :0.000   Min.   :0.0000   Min.   :0.00
## 1st Qu.:2.000   1st Qu.:5.000   1st Qu.:0.0000   1st Qu.:1.00
## Median :3.000   Median :6.000   Median :1.0000   Median :2.00
## Mean   :3.259   Mean    :6.183   Mean    :0.8835   Mean    :2.29
```

##	3rd Qu.:4.000	3rd Qu.:7.000	3rd Qu.:1.0000	3rd Qu.:3.00	
##	Max. :9.000	Max. :9.000	Max. :7.0000	Max. :9.00	
##	MFALLEEN	MFGEKIND	MFWEKIND	MOPLHOOG	MOPLMIDD
##	Min. :0.000	Min. :0.00	Min. :0.0	Min. :0.000	Min. :0.000
##	1st Qu.:0.000	1st Qu.:2.00	1st Qu.:3.0	1st Qu.:0.000	1st Qu.:2.000
##	Median :2.000	Median :3.00	Median :4.0	Median :1.000	Median :3.000
##	Mean :1.888	Mean :3.23	Mean :4.3	Mean :1.461	Mean :3.351
##	3rd Qu.:3.000	3rd Qu.:4.00	3rd Qu.:6.0	3rd Qu.:2.000	3rd Qu.:4.000
##	Max. :9.000	Max. :9.00	Max. :9.0	Max. :9.000	Max. :9.000
##	MOPLLAAG	MBERHOOG	MBERZELF	MBERBOER	
##	Min. :0.000	Min. :0.000	Min. :0.000	Min. :0.0000	
##	1st Qu.:3.000	1st Qu.:0.000	1st Qu.:0.000	1st Qu.:0.0000	
##	Median :5.000	Median :2.000	Median :0.000	Median :0.0000	
##	Mean :4.572	Mean :1.895	Mean :0.398	Mean :0.5223	
##	3rd Qu.:6.000	3rd Qu.:3.000	3rd Qu.:1.000	3rd Qu.:1.0000	
##	Max. :9.000	Max. :9.000	Max. :5.000	Max. :9.0000	
##	MBERMIDD	MBERARBG	MBERARBO	MSKA	MSKB1
##	Min. :0.000	Min. :0.00	Min. :0.000	Min. :0.000	Min. :0.000
##	1st Qu.:2.000	1st Qu.:1.00	1st Qu.:1.000	1st Qu.:0.000	1st Qu.:1.000
##	Median :3.000	Median :2.00	Median :2.000	Median :1.000	Median :2.000
##	Mean :2.899	Mean :2.22	Mean :2.306	Mean :1.621	Mean :1.607
##	3rd Qu.:4.000	3rd Qu.:3.00	3rd Qu.:3.000	3rd Qu.:2.000	3rd Qu.:2.000
##	Max. :9.000	Max. :9.00	Max. :9.000	Max. :9.000	Max. :9.000
##	MSKB2	MSKC	MSKD	MHHUUR	
##	Min. :0.000	Min. :0.000	Min. :0.000	Min. :0.000	
##	1st Qu.:1.000	1st Qu.:2.000	1st Qu.:0.000	1st Qu.:2.000	
##	Median :2.000	Median :4.000	Median :1.000	Median :4.000	
##	Mean :2.203	Mean :3.759	Mean :1.067	Mean :4.237	
##	3rd Qu.:3.000	3rd Qu.:5.000	3rd Qu.:2.000	3rd Qu.:7.000	
##	Max. :9.000	Max. :9.000	Max. :9.000	Max. :9.000	
##	MHKOOP	MAUT1	MAUT2	MAUTO	MZFONDS
##	Min. :0.000	Min. :0.00	Min. :0.000	Min. :0.000	Min. :0.000
##	1st Qu.:2.000	1st Qu.:5.00	1st Qu.:0.000	1st Qu.:1.000	1st Qu.:5.000
##	Median :5.000	Median :6.00	Median :1.000	Median :2.000	Median :7.000
##	Mean :4.772	Mean :6.04	Mean :1.316	Mean :1.959	Mean :6.277
##	3rd Qu.:7.000	3rd Qu.:7.00	3rd Qu.:2.000	3rd Qu.:3.000	3rd Qu.:8.000
##	Max. :9.000	Max. :9.00	Max. :7.000	Max. :9.000	Max. :9.000
##	MZPART	MINKM30	MINK3045	MINK4575	
##	Min. :0.000	Min. :0.000	Min. :0.000	Min. :0.000	
##	1st Qu.:1.000	1st Qu.:1.000	1st Qu.:2.000	1st Qu.:1.000	
##	Median :2.000	Median :2.000	Median :4.000	Median :3.000	
##	Mean :2.729	Mean :2.574	Mean :3.536	Mean :2.731	
##	3rd Qu.:4.000	3rd Qu.:4.000	3rd Qu.:5.000	3rd Qu.:4.000	
##	Max. :9.000	Max. :9.000	Max. :9.000	Max. :9.000	
##	MINK7512	MINK123M	MINKGEM	MKOOPKLA	
##	Min. :0.0000	Min. :0.0000	Min. :0.000	Min. :1.000	
##	1st Qu.:0.0000	1st Qu.:0.0000	1st Qu.:3.000	1st Qu.:3.000	
##	Median :0.0000	Median :0.0000	Median :4.000	Median :4.000	
##	Mean :0.7961	Mean :0.2027	Mean :3.784	Mean :4.236	
##	3rd Qu.:1.0000	3rd Qu.:0.0000	3rd Qu.:4.000	3rd Qu.:6.000	
##	Max. :9.0000	Max. :9.0000	Max. :9.000	Max. :8.000	
##	PWAPART	PWABEDR	PWALAND	PPERSAUT	
##	Min. :0.0000	Min. :0.00000	Min. :0.00000	Min. :0.00	
##	1st Qu.:0.0000	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.00	

##	Median :0.0000	Median :0.00000	Median :0.00000	Median :5.00
##	Mean :0.7712	Mean :0.04002	Mean :0.07162	Mean :2.97
##	3rd Qu.:2.0000	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:6.00
##	Max. :3.0000	Max. :6.00000	Max. :4.00000	Max. :8.00
##	PBESAUT	PMOTSCO	PVRAAUT	PAANHANG
##	Min. :0.00000	Min. :0.0000	Min. :0.000000	Min. :0.00000
##	1st Qu.:0.00000	1st Qu.:0.0000	1st Qu.:0.000000	1st Qu.:0.00000
##	Median :0.00000	Median :0.0000	Median :0.000000	Median :0.00000
##	Mean :0.04827	Mean :0.1754	Mean :0.009447	Mean :0.02096
##	3rd Qu.:0.00000	3rd Qu.:0.0000	3rd Qu.:0.000000	3rd Qu.:0.00000
##	Max. :7.00000	Max. :7.0000	Max. :9.000000	Max. :5.00000
##	PTRACTOR	PWERKT	PBROM	PLEVEN
##	Min. :0.00000	Min. :0.00000	Min. :0.000	Min. :0.0000
##	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.000	1st Qu.:0.0000
##	Median :0.00000	Median :0.00000	Median :0.000	Median :0.0000
##	Mean :0.09258	Mean :0.01305	Mean :0.215	Mean :0.1948
##	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:0.000	3rd Qu.:0.0000
##	Max. :6.00000	Max. :6.00000	Max. :6.000	Max. :9.0000
##	PPERSONG	PGEZONG	PWAOREG	PBRAND
##	Min. :0.00000	Min. :0.00000	Min. :0.00000	Min. :0.000
##	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.000
##	Median :0.00000	Median :0.00000	Median :0.00000	Median :2.000
##	Mean :0.01374	Mean :0.01529	Mean :0.02353	Mean :1.828
##	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:4.000
##	Max. :6.00000	Max. :3.00000	Max. :7.00000	Max. :8.000
##	PZEILPL	PPLEZIER	PFIETS	PINBOED
##	Min. :0.0000000	Min. :0.00000	Min. :0.00000	Min. :0.00000
##	1st Qu.:0.0000000	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.00000
##	Median :0.0000000	Median :0.00000	Median :0.00000	Median :0.00000
##	Mean :0.0008588	Mean :0.01889	Mean :0.02525	Mean :0.01563
##	3rd Qu.:0.0000000	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:0.00000
##	Max. :3.0000000	Max. :6.00000	Max. :1.00000	Max. :6.00000
##	PBYSTAND	AWAPART	AWABEDR	AWALAND
##	Min. :0.00000	Min. :0.000	Min. :0.00000	Min. :0.00000
##	1st Qu.:0.00000	1st Qu.:0.000	1st Qu.:0.00000	1st Qu.:0.00000
##	Median :0.00000	Median :0.000	Median :0.00000	Median :0.00000
##	Mean :0.04758	Mean :0.403	Mean :0.01477	Mean :0.02061
##	3rd Qu.:0.00000	3rd Qu.:1.000	3rd Qu.:0.00000	3rd Qu.:0.00000
##	Max. :5.00000	Max. :2.000	Max. :5.00000	Max. :1.00000
##	APERSAUT	ABESAUT	AMOTSCO	AVRAAUT
##	Min. :0.0000	Min. :0.00000	Min. :0.00000	Min. :0.000000
##	1st Qu.:0.0000	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.000000
##	Median :1.0000	Median :0.00000	Median :0.00000	Median :0.000000
##	Mean :0.5622	Mean :0.01048	Mean :0.04105	Mean :0.002233
##	3rd Qu.:1.0000	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:0.000000
##	Max. :7.0000	Max. :4.00000	Max. :8.00000	Max. :3.000000
##	AAANHANG	ATTRACTOR	AWERKT	ABROM
##	Min. :0.00000	Min. :0.00000	Min. :0.000000	Min. :0.00000
##	1st Qu.:0.00000	1st Qu.:0.00000	1st Qu.:0.000000	1st Qu.:0.00000
##	Median :0.00000	Median :0.00000	Median :0.000000	Median :0.00000
##	Mean :0.01254	Mean :0.03367	Mean :0.006183	Mean :0.07042
##	3rd Qu.:0.00000	3rd Qu.:0.00000	3rd Qu.:0.000000	3rd Qu.:0.00000
##	Max. :3.00000	Max. :4.00000	Max. :6.000000	Max. :2.00000
##	ALEVEN	APERSONG	AGEZONG	AWAOREG

```
## Min. :0.00000 Min. :0.000000 Min. :0.000000 Min. :0.000000
## 1st Qu.:0.00000 1st Qu.:0.000000 1st Qu.:0.000000 1st Qu.:0.000000
## Median :0.00000 Median :0.000000 Median :0.000000 Median :0.000000
## Mean :0.07661 Mean :0.005325 Mean :0.006527 Mean :0.004638
## 3rd Qu.:0.00000 3rd Qu.:0.000000 3rd Qu.:0.000000 3rd Qu.:0.000000
## Max. :8.00000 Max. :1.000000 Max. :1.000000 Max. :2.000000
## ABRAND AZEILPL APLEZIER AFIETS
## Min. :0.0000 Min. :0.0000000 Min. :0.000000 Min. :0.000000
## 1st Qu.:0.0000 1st Qu.:0.0000000 1st Qu.:0.000000 1st Qu.:0.000000
## Median :1.0000 Median :0.0000000 Median :0.000000 Median :0.000000
## Mean :0.5701 Mean :0.0005153 Mean :0.006012 Mean :0.03178
## 3rd Qu.:1.0000 3rd Qu.:0.0000000 3rd Qu.:0.000000 3rd Qu.:0.000000
## Max. :7.0000 Max. :1.0000000 Max. :2.000000 Max. :3.000000
## AINBOED ABYSTAND Purchase
## Min. :0.000000 Min. :0.00000 No :5474
## 1st Qu.:0.000000 1st Qu.:0.00000 Yes: 348
## Median :0.000000 Median :0.00000
## Mean :0.007901 Mean :0.01426
## 3rd Qu.:0.000000 3rd Qu.:0.00000
## Max. :2.000000 Max. :2.00000
```

```
dim(Caravan)
```

```
## [1] 5822 86
```

```
attach(Caravan)
summary(Purchase)
```

```
## No Yes
## 5474 348
```

```
standardized.X <- scale(Caravan[, -86])
var(Caravan[, 1])
```

```
## [1] 165.0378
```

```
var(Caravan[, 2])
```

```
## [1] 0.1647078
```

```
var(standardized.X[, 1])
```

```
## [1] 1
```

```
var(standardized.X[, 2])
```

```
## [1] 1
```