

BA class assignment

Harish Kunaparaju

2022-09-19

```
library(ISLR)
input<- Carseats
```

```
summary(input)
```

```
##      Sales      CompPrice      Income      Advertising
## Min.   : 0.000   Min.   : 77   Min.   : 21.00   Min.   : 0.000
## 1st Qu.: 5.390   1st Qu.:115   1st Qu.: 42.75   1st Qu.: 0.000
## Median : 7.490   Median :125   Median : 69.00   Median : 5.000
## Mean   : 7.496   Mean   :125   Mean   : 68.66   Mean   : 6.635
## 3rd Qu.: 9.320   3rd Qu.:135   3rd Qu.: 91.00   3rd Qu.:12.000
## Max.   :16.270   Max.   :175   Max.   :120.00   Max.   :29.000
##      Population      Price      ShelfLoc      Age      Education
## Min.   : 10.0   Min.   : 24.0   Bad   : 96   Min.   :25.00   Min.   :10.0
## 1st Qu.:139.0   1st Qu.:100.0   Good  : 85   1st Qu.:39.75   1st Qu.:12.0
## Median :272.0   Median :117.0   Medium:219   Median :54.50   Median :14.0
## Mean   :264.8   Mean   :115.8                      Mean   :53.32   Mean   :13.9
## 3rd Qu.:398.5   3rd Qu.:131.0                      3rd Qu.:66.00   3rd Qu.:16.0
## Max.   :509.0   Max.   :191.0                      Max.   :80.00   Max.   :18.0
## Urban      US
## No :118    No :142
## Yes:282    Yes:258
##
##
##
##
```

```
print(input)
```

```
##      Sales CompPrice Income Advertising Population Price ShelfLoc Age Education
## 1      9.50      138      73          11      276      120      Bad   42          17
## 2     11.22      111      48          16      260      83      Good   65          10
## 3     10.06      113      35          10      269      80      Medium  59          12
## 4      7.40      117     100           4      466      97      Medium  55          14
## 5      4.15      141      64           3      340     128      Bad    38          13
## 6     10.81      124     113          13      501      72      Bad    78          16
## 7      6.63      115     105           0       45     108      Medium  71          15
## 8     11.85      136      81          15      425     120      Good   67          10
## 9      6.54      132     110           0      108     124      Medium  76          10
## 10     4.69      132     113           0      131     124      Medium  76          17
## 11     9.01      121      78           9      150     100      Bad    26          10
## 12    11.96      117      94           4      503      94      Good   50          13
## 13     3.98      122      35           2      393     136      Medium  62          18
## 14    10.96      115      28          11       29      86      Good   53          18
```

## 15	11.17	107	117	11	148	118	Good	52	18
## 16	8.71	149	95	5	400	144	Medium	76	18
## 17	7.58	118	32	0	284	110	Good	63	13
## 18	12.29	147	74	13	251	131	Good	52	10
## 19	13.91	110	110	0	408	68	Good	46	17
## 20	8.73	129	76	16	58	121	Medium	69	12
## 21	6.41	125	90	2	367	131	Medium	35	18
## 22	12.13	134	29	12	239	109	Good	62	18
## 23	5.08	128	46	6	497	138	Medium	42	13
## 24	5.87	121	31	0	292	109	Medium	79	10
## 25	10.14	145	119	16	294	113	Bad	42	12
## 26	14.90	139	32	0	176	82	Good	54	11
## 27	8.33	107	115	11	496	131	Good	50	11
## 28	5.27	98	118	0	19	107	Medium	64	17
## 29	2.99	103	74	0	359	97	Bad	55	11
## 30	7.81	104	99	15	226	102	Bad	58	17
## 31	13.55	125	94	0	447	89	Good	30	12
## 32	8.25	136	58	16	241	131	Medium	44	18
## 33	6.20	107	32	12	236	137	Good	64	10
## 34	8.77	114	38	13	317	128	Good	50	16
## 35	2.67	115	54	0	406	128	Medium	42	17
## 36	11.07	131	84	11	29	96	Medium	44	17
## 37	8.89	122	76	0	270	100	Good	60	18
## 38	4.95	121	41	5	412	110	Medium	54	10
## 39	6.59	109	73	0	454	102	Medium	65	15
## 40	3.24	130	60	0	144	138	Bad	38	10
## 41	2.07	119	98	0	18	126	Bad	73	17
## 42	7.96	157	53	0	403	124	Bad	58	16
## 43	10.43	77	69	0	25	24	Medium	50	18
## 44	4.12	123	42	11	16	134	Medium	59	13
## 45	4.16	85	79	6	325	95	Medium	69	13
## 46	4.56	141	63	0	168	135	Bad	44	12
## 47	12.44	127	90	14	16	70	Medium	48	15
## 48	4.38	126	98	0	173	108	Bad	55	16
## 49	3.91	116	52	0	349	98	Bad	69	18
## 50	10.61	157	93	0	51	149	Good	32	17
## 51	1.42	99	32	18	341	108	Bad	80	16
## 52	4.42	121	90	0	150	108	Bad	75	16
## 53	7.91	153	40	3	112	129	Bad	39	18
## 54	6.92	109	64	13	39	119	Medium	61	17
## 55	4.90	134	103	13	25	144	Medium	76	17
## 56	6.85	143	81	5	60	154	Medium	61	18
## 57	11.91	133	82	0	54	84	Medium	50	17
## 58	0.91	93	91	0	22	117	Bad	75	11
## 59	5.42	103	93	15	188	103	Bad	74	16
## 60	5.21	118	71	4	148	114	Medium	80	13
## 61	8.32	122	102	19	469	123	Bad	29	13
## 62	7.32	105	32	0	358	107	Medium	26	13
## 63	1.82	139	45	0	146	133	Bad	77	17
## 64	8.47	119	88	10	170	101	Medium	61	13
## 65	7.80	100	67	12	184	104	Medium	32	16
## 66	4.90	122	26	0	197	128	Medium	55	13
## 67	8.85	127	92	0	508	91	Medium	56	18
## 68	9.01	126	61	14	152	115	Medium	47	16

## 69	13.39	149	69	20	366	134	Good	60	13
## 70	7.99	127	59	0	339	99	Medium	65	12
## 71	9.46	89	81	15	237	99	Good	74	12
## 72	6.50	148	51	16	148	150	Medium	58	17
## 73	5.52	115	45	0	432	116	Medium	25	15
## 74	12.61	118	90	10	54	104	Good	31	11
## 75	6.20	150	68	5	125	136	Medium	64	13
## 76	8.55	88	111	23	480	92	Bad	36	16
## 77	10.64	102	87	10	346	70	Medium	64	15
## 78	7.70	118	71	12	44	89	Medium	67	18
## 79	4.43	134	48	1	139	145	Medium	65	12
## 80	9.14	134	67	0	286	90	Bad	41	13
## 81	8.01	113	100	16	353	79	Bad	68	11
## 82	7.52	116	72	0	237	128	Good	70	13
## 83	11.62	151	83	4	325	139	Good	28	17
## 84	4.42	109	36	7	468	94	Bad	56	11
## 85	2.23	111	25	0	52	121	Bad	43	18
## 86	8.47	125	103	0	304	112	Medium	49	13
## 87	8.70	150	84	9	432	134	Medium	64	15
## 88	11.70	131	67	7	272	126	Good	54	16
## 89	6.56	117	42	7	144	111	Medium	62	10
## 90	7.95	128	66	3	493	119	Medium	45	16
## 91	5.33	115	22	0	491	103	Medium	64	11
## 92	4.81	97	46	11	267	107	Medium	80	15
## 93	4.53	114	113	0	97	125	Medium	29	12
## 94	8.86	145	30	0	67	104	Medium	55	17
## 95	8.39	115	97	5	134	84	Bad	55	11
## 96	5.58	134	25	10	237	148	Medium	59	13
## 97	9.48	147	42	10	407	132	Good	73	16
## 98	7.45	161	82	5	287	129	Bad	33	16
## 99	12.49	122	77	24	382	127	Good	36	16
## 100	4.88	121	47	3	220	107	Bad	56	16
## 101	4.11	113	69	11	94	106	Medium	76	12
## 102	6.20	128	93	0	89	118	Medium	34	18
## 103	5.30	113	22	0	57	97	Medium	65	16
## 104	5.07	123	91	0	334	96	Bad	78	17
## 105	4.62	121	96	0	472	138	Medium	51	12
## 106	5.55	104	100	8	398	97	Medium	61	11
## 107	0.16	102	33	0	217	139	Medium	70	18
## 108	8.55	134	107	0	104	108	Medium	60	12
## 109	3.47	107	79	2	488	103	Bad	65	16
## 110	8.98	115	65	0	217	90	Medium	60	17
## 111	9.00	128	62	7	125	116	Medium	43	14
## 112	6.62	132	118	12	272	151	Medium	43	14
## 113	6.67	116	99	5	298	125	Good	62	12
## 114	6.01	131	29	11	335	127	Bad	33	12
## 115	9.31	122	87	9	17	106	Medium	65	13
## 116	8.54	139	35	0	95	129	Medium	42	13
## 117	5.08	135	75	0	202	128	Medium	80	10
## 118	8.80	145	53	0	507	119	Medium	41	12
## 119	7.57	112	88	2	243	99	Medium	62	11
## 120	7.37	130	94	8	137	128	Medium	64	12
## 121	6.87	128	105	11	249	131	Medium	63	13
## 122	11.67	125	89	10	380	87	Bad	28	10

## 123	6.88	119	100	5	45	108	Medium	75	10
## 124	8.19	127	103	0	125	155	Good	29	15
## 125	8.87	131	113	0	181	120	Good	63	14
## 126	9.34	89	78	0	181	49	Medium	43	15
## 127	11.27	153	68	2	60	133	Good	59	16
## 128	6.52	125	48	3	192	116	Medium	51	14
## 129	4.96	133	100	3	350	126	Bad	55	13
## 130	4.47	143	120	7	279	147	Bad	40	10
## 131	8.41	94	84	13	497	77	Medium	51	12
## 132	6.50	108	69	3	208	94	Medium	77	16
## 133	9.54	125	87	9	232	136	Good	72	10
## 134	7.62	132	98	2	265	97	Bad	62	12
## 135	3.67	132	31	0	327	131	Medium	76	16
## 136	6.44	96	94	14	384	120	Medium	36	18
## 137	5.17	131	75	0	10	120	Bad	31	18
## 138	6.52	128	42	0	436	118	Medium	80	11
## 139	10.27	125	103	12	371	109	Medium	44	10
## 140	12.30	146	62	10	310	94	Medium	30	13
## 141	6.03	133	60	10	277	129	Medium	45	18
## 142	6.53	140	42	0	331	131	Bad	28	15
## 143	7.44	124	84	0	300	104	Medium	77	15
## 144	0.53	122	88	7	36	159	Bad	28	17
## 145	9.09	132	68	0	264	123	Good	34	11
## 146	8.77	144	63	11	27	117	Medium	47	17
## 147	3.90	114	83	0	412	131	Bad	39	14
## 148	10.51	140	54	9	402	119	Good	41	16
## 149	7.56	110	119	0	384	97	Medium	72	14
## 150	11.48	121	120	13	140	87	Medium	56	11
## 151	10.49	122	84	8	176	114	Good	57	10
## 152	10.77	111	58	17	407	103	Good	75	17
## 153	7.64	128	78	0	341	128	Good	45	13
## 154	5.93	150	36	7	488	150	Medium	25	17
## 155	6.89	129	69	10	289	110	Medium	50	16
## 156	7.71	98	72	0	59	69	Medium	65	16
## 157	7.49	146	34	0	220	157	Good	51	16
## 158	10.21	121	58	8	249	90	Medium	48	13
## 159	12.53	142	90	1	189	112	Good	39	10
## 160	9.32	119	60	0	372	70	Bad	30	18
## 161	4.67	111	28	0	486	111	Medium	29	12
## 162	2.93	143	21	5	81	160	Medium	67	12
## 163	3.63	122	74	0	424	149	Medium	51	13
## 164	5.68	130	64	0	40	106	Bad	39	17
## 165	8.22	148	64	0	58	141	Medium	27	13
## 166	0.37	147	58	7	100	191	Bad	27	15
## 167	6.71	119	67	17	151	137	Medium	55	11
## 168	6.71	106	73	0	216	93	Medium	60	13
## 169	7.30	129	89	0	425	117	Medium	45	10
## 170	11.48	104	41	15	492	77	Good	73	18
## 171	8.01	128	39	12	356	118	Medium	71	10
## 172	12.49	93	106	12	416	55	Medium	75	15
## 173	9.03	104	102	13	123	110	Good	35	16
## 174	6.38	135	91	5	207	128	Medium	66	18
## 175	0.00	139	24	0	358	185	Medium	79	15
## 176	7.54	115	89	0	38	122	Medium	25	12

## 177	5.61	138	107	9	480	154	Medium	47	11
## 178	10.48	138	72	0	148	94	Medium	27	17
## 179	10.66	104	71	14	89	81	Medium	25	14
## 180	7.78	144	25	3	70	116	Medium	77	18
## 181	4.94	137	112	15	434	149	Bad	66	13
## 182	7.43	121	83	0	79	91	Medium	68	11
## 183	4.74	137	60	4	230	140	Bad	25	13
## 184	5.32	118	74	6	426	102	Medium	80	18
## 185	9.95	132	33	7	35	97	Medium	60	11
## 186	10.07	130	100	11	449	107	Medium	64	10
## 187	8.68	120	51	0	93	86	Medium	46	17
## 188	6.03	117	32	0	142	96	Bad	62	17
## 189	8.07	116	37	0	426	90	Medium	76	15
## 190	12.11	118	117	18	509	104	Medium	26	15
## 191	8.79	130	37	13	297	101	Medium	37	13
## 192	6.67	156	42	13	170	173	Good	74	14
## 193	7.56	108	26	0	408	93	Medium	56	14
## 194	13.28	139	70	7	71	96	Good	61	10
## 195	7.23	112	98	18	481	128	Medium	45	11
## 196	4.19	117	93	4	420	112	Bad	66	11
## 197	4.10	130	28	6	410	133	Bad	72	16
## 198	2.52	124	61	0	333	138	Medium	76	16
## 199	3.62	112	80	5	500	128	Medium	69	10
## 200	6.42	122	88	5	335	126	Medium	64	14
## 201	5.56	144	92	0	349	146	Medium	62	12
## 202	5.94	138	83	0	139	134	Medium	54	18
## 203	4.10	121	78	4	413	130	Bad	46	10
## 204	2.05	131	82	0	132	157	Bad	25	14
## 205	8.74	155	80	0	237	124	Medium	37	14
## 206	5.68	113	22	1	317	132	Medium	28	12
## 207	4.97	162	67	0	27	160	Medium	77	17
## 208	8.19	111	105	0	466	97	Bad	61	10
## 209	7.78	86	54	0	497	64	Bad	33	12
## 210	3.02	98	21	11	326	90	Bad	76	11
## 211	4.36	125	41	2	357	123	Bad	47	14
## 212	9.39	117	118	14	445	120	Medium	32	15
## 213	12.04	145	69	19	501	105	Medium	45	11
## 214	8.23	149	84	5	220	139	Medium	33	10
## 215	4.83	115	115	3	48	107	Medium	73	18
## 216	2.34	116	83	15	170	144	Bad	71	11
## 217	5.73	141	33	0	243	144	Medium	34	17
## 218	4.34	106	44	0	481	111	Medium	70	14
## 219	9.70	138	61	12	156	120	Medium	25	14
## 220	10.62	116	79	19	359	116	Good	58	17
## 221	10.59	131	120	15	262	124	Medium	30	10
## 222	6.43	124	44	0	125	107	Medium	80	11
## 223	7.49	136	119	6	178	145	Medium	35	13
## 224	3.45	110	45	9	276	125	Medium	62	14
## 225	4.10	134	82	0	464	141	Medium	48	13
## 226	6.68	107	25	0	412	82	Bad	36	14
## 227	7.80	119	33	0	245	122	Good	56	14
## 228	8.69	113	64	10	68	101	Medium	57	16
## 229	5.40	149	73	13	381	163	Bad	26	11
## 230	11.19	98	104	0	404	72	Medium	27	18

## 231	5.16	115	60	0	119	114	Bad	38	14
## 232	8.09	132	69	0	123	122	Medium	27	11
## 233	13.14	137	80	10	24	105	Good	61	15
## 234	8.65	123	76	18	218	120	Medium	29	14
## 235	9.43	115	62	11	289	129	Good	56	16
## 236	5.53	126	32	8	95	132	Medium	50	17
## 237	9.32	141	34	16	361	108	Medium	69	10
## 238	9.62	151	28	8	499	135	Medium	48	10
## 239	7.36	121	24	0	200	133	Good	73	13
## 240	3.89	123	105	0	149	118	Bad	62	16
## 241	10.31	159	80	0	362	121	Medium	26	18
## 242	12.01	136	63	0	160	94	Medium	38	12
## 243	4.68	124	46	0	199	135	Medium	52	14
## 244	7.82	124	25	13	87	110	Medium	57	10
## 245	8.78	130	30	0	391	100	Medium	26	18
## 246	10.00	114	43	0	199	88	Good	57	10
## 247	6.90	120	56	20	266	90	Bad	78	18
## 248	5.04	123	114	0	298	151	Bad	34	16
## 249	5.36	111	52	0	12	101	Medium	61	11
## 250	5.05	125	67	0	86	117	Bad	65	11
## 251	9.16	137	105	10	435	156	Good	72	14
## 252	3.72	139	111	5	310	132	Bad	62	13
## 253	8.31	133	97	0	70	117	Medium	32	16
## 254	5.64	124	24	5	288	122	Medium	57	12
## 255	9.58	108	104	23	353	129	Good	37	17
## 256	7.71	123	81	8	198	81	Bad	80	15
## 257	4.20	147	40	0	277	144	Medium	73	10
## 258	8.67	125	62	14	477	112	Medium	80	13
## 259	3.47	108	38	0	251	81	Bad	72	14
## 260	5.12	123	36	10	467	100	Bad	74	11
## 261	7.67	129	117	8	400	101	Bad	36	10
## 262	5.71	121	42	4	188	118	Medium	54	15
## 263	6.37	120	77	15	86	132	Medium	48	18
## 264	7.77	116	26	6	434	115	Medium	25	17
## 265	6.95	128	29	5	324	159	Good	31	15
## 266	5.31	130	35	10	402	129	Bad	39	17
## 267	9.10	128	93	12	343	112	Good	73	17
## 268	5.83	134	82	7	473	112	Bad	51	12
## 269	6.53	123	57	0	66	105	Medium	39	11
## 270	5.01	159	69	0	438	166	Medium	46	17
## 271	11.99	119	26	0	284	89	Good	26	10
## 272	4.55	111	56	0	504	110	Medium	62	16
## 273	12.98	113	33	0	14	63	Good	38	12
## 274	10.04	116	106	8	244	86	Medium	58	12
## 275	7.22	135	93	2	67	119	Medium	34	11
## 276	6.67	107	119	11	210	132	Medium	53	11
## 277	6.93	135	69	14	296	130	Medium	73	15
## 278	7.80	136	48	12	326	125	Medium	36	16
## 279	7.22	114	113	2	129	151	Good	40	15
## 280	3.42	141	57	13	376	158	Medium	64	18
## 281	2.86	121	86	10	496	145	Bad	51	10
## 282	11.19	122	69	7	303	105	Good	45	16
## 283	7.74	150	96	0	80	154	Good	61	11
## 284	5.36	135	110	0	112	117	Medium	80	16

## 285	6.97	106	46	11	414	96	Bad	79	17
## 286	7.60	146	26	11	261	131	Medium	39	10
## 287	7.53	117	118	11	429	113	Medium	67	18
## 288	6.88	95	44	4	208	72	Bad	44	17
## 289	6.98	116	40	0	74	97	Medium	76	15
## 290	8.75	143	77	25	448	156	Medium	43	17
## 291	9.49	107	111	14	400	103	Medium	41	11
## 292	6.64	118	70	0	106	89	Bad	39	17
## 293	11.82	113	66	16	322	74	Good	76	15
## 294	11.28	123	84	0	74	89	Good	59	10
## 295	12.66	148	76	3	126	99	Good	60	11
## 296	4.21	118	35	14	502	137	Medium	79	10
## 297	8.21	127	44	13	160	123	Good	63	18
## 298	3.07	118	83	13	276	104	Bad	75	10
## 299	10.98	148	63	0	312	130	Good	63	15
## 300	9.40	135	40	17	497	96	Medium	54	17
## 301	8.57	116	78	1	158	99	Medium	45	11
## 302	7.41	99	93	0	198	87	Medium	57	16
## 303	5.28	108	77	13	388	110	Bad	74	14
## 304	10.01	133	52	16	290	99	Medium	43	11
## 305	11.93	123	98	12	408	134	Good	29	10
## 306	8.03	115	29	26	394	132	Medium	33	13
## 307	4.78	131	32	1	85	133	Medium	48	12
## 308	5.90	138	92	0	13	120	Bad	61	12
## 309	9.24	126	80	19	436	126	Medium	52	10
## 310	11.18	131	111	13	33	80	Bad	68	18
## 311	9.53	175	65	29	419	166	Medium	53	12
## 312	6.15	146	68	12	328	132	Bad	51	14
## 313	6.80	137	117	5	337	135	Bad	38	10
## 314	9.33	103	81	3	491	54	Medium	66	13
## 315	7.72	133	33	10	333	129	Good	71	14
## 316	6.39	131	21	8	220	171	Good	29	14
## 317	15.63	122	36	5	369	72	Good	35	10
## 318	6.41	142	30	0	472	136	Good	80	15
## 319	10.08	116	72	10	456	130	Good	41	14
## 320	6.97	127	45	19	459	129	Medium	57	11
## 321	5.86	136	70	12	171	152	Medium	44	18
## 322	7.52	123	39	5	499	98	Medium	34	15
## 323	9.16	140	50	10	300	139	Good	60	15
## 324	10.36	107	105	18	428	103	Medium	34	12
## 325	2.66	136	65	4	133	150	Bad	53	13
## 326	11.70	144	69	11	131	104	Medium	47	11
## 327	4.69	133	30	0	152	122	Medium	53	17
## 328	6.23	112	38	17	316	104	Medium	80	16
## 329	3.15	117	66	1	65	111	Bad	55	11
## 330	11.27	100	54	9	433	89	Good	45	12
## 331	4.99	122	59	0	501	112	Bad	32	14
## 332	10.10	135	63	15	213	134	Medium	32	10
## 333	5.74	106	33	20	354	104	Medium	61	12
## 334	5.87	136	60	7	303	147	Medium	41	10
## 335	7.63	93	117	9	489	83	Bad	42	13
## 336	6.18	120	70	15	464	110	Medium	72	15
## 337	5.17	138	35	6	60	143	Bad	28	18
## 338	8.61	130	38	0	283	102	Medium	80	15

## 339	5.97	112	24	0	164	101	Medium	45	11
## 340	11.54	134	44	4	219	126	Good	44	15
## 341	7.50	140	29	0	105	91	Bad	43	16
## 342	7.38	98	120	0	268	93	Medium	72	10
## 343	7.81	137	102	13	422	118	Medium	71	10
## 344	5.99	117	42	10	371	121	Bad	26	14
## 345	8.43	138	80	0	108	126	Good	70	13
## 346	4.81	121	68	0	279	149	Good	79	12
## 347	8.97	132	107	0	144	125	Medium	33	13
## 348	6.88	96	39	0	161	112	Good	27	14
## 349	12.57	132	102	20	459	107	Good	49	11
## 350	9.32	134	27	18	467	96	Medium	49	14
## 351	8.64	111	101	17	266	91	Medium	63	17
## 352	10.44	124	115	16	458	105	Medium	62	16
## 353	13.44	133	103	14	288	122	Good	61	17
## 354	9.45	107	67	12	430	92	Medium	35	12
## 355	5.30	133	31	1	80	145	Medium	42	18
## 356	7.02	130	100	0	306	146	Good	42	11
## 357	3.58	142	109	0	111	164	Good	72	12
## 358	13.36	103	73	3	276	72	Medium	34	15
## 359	4.17	123	96	10	71	118	Bad	69	11
## 360	3.13	130	62	11	396	130	Bad	66	14
## 361	8.77	118	86	7	265	114	Good	52	15
## 362	8.68	131	25	10	183	104	Medium	56	15
## 363	5.25	131	55	0	26	110	Bad	79	12
## 364	10.26	111	75	1	377	108	Good	25	12
## 365	10.50	122	21	16	488	131	Good	30	14
## 366	6.53	154	30	0	122	162	Medium	57	17
## 367	5.98	124	56	11	447	134	Medium	53	12
## 368	14.37	95	106	0	256	53	Good	52	17
## 369	10.71	109	22	10	348	79	Good	74	14
## 370	10.26	135	100	22	463	122	Medium	36	14
## 371	7.68	126	41	22	403	119	Bad	42	12
## 372	9.08	152	81	0	191	126	Medium	54	16
## 373	7.80	121	50	0	508	98	Medium	65	11
## 374	5.58	137	71	0	402	116	Medium	78	17
## 375	9.44	131	47	7	90	118	Medium	47	12
## 376	7.90	132	46	4	206	124	Medium	73	11
## 377	16.27	141	60	19	319	92	Good	44	11
## 378	6.81	132	61	0	263	125	Medium	41	12
## 379	6.11	133	88	3	105	119	Medium	79	12
## 380	5.81	125	111	0	404	107	Bad	54	15
## 381	9.64	106	64	10	17	89	Medium	68	17
## 382	3.90	124	65	21	496	151	Bad	77	13
## 383	4.95	121	28	19	315	121	Medium	66	14
## 384	9.35	98	117	0	76	68	Medium	63	10
## 385	12.85	123	37	15	348	112	Good	28	12
## 386	5.87	131	73	13	455	132	Medium	62	17
## 387	5.32	152	116	0	170	160	Medium	39	16
## 388	8.67	142	73	14	238	115	Medium	73	14
## 389	8.14	135	89	11	245	78	Bad	79	16
## 390	8.44	128	42	8	328	107	Medium	35	12
## 391	5.47	108	75	9	61	111	Medium	67	12
## 392	6.10	153	63	0	49	124	Bad	56	16

## 393	4.53	129	42	13	315	130	Bad	34	13
## 394	5.57	109	51	10	26	120	Medium	30	17
## 395	5.35	130	58	19	366	139	Bad	33	16
## 396	12.57	138	108	17	203	128	Good	33	14
## 397	6.14	139	23	3	37	120	Medium	55	11
## 398	7.41	162	26	12	368	159	Medium	40	18
## 399	5.94	100	79	7	284	95	Bad	50	12
## 400	9.71	134	37	0	27	120	Good	49	16
##	Urban	US							
## 1	Yes	Yes							
## 2	Yes	Yes							
## 3	Yes	Yes							
## 4	Yes	Yes							
## 5	Yes	No							
## 6	No	Yes							
## 7	Yes	No							
## 8	Yes	Yes							
## 9	No	No							
## 10	No	Yes							
## 11	No	Yes							
## 12	Yes	Yes							
## 13	Yes	No							
## 14	Yes	Yes							
## 15	Yes	Yes							
## 16	No	No							
## 17	Yes	No							
## 18	Yes	Yes							
## 19	No	Yes							
## 20	Yes	Yes							
## 21	Yes	Yes							
## 22	No	Yes							
## 23	Yes	No							
## 24	Yes	No							
## 25	Yes	Yes							
## 26	No	No							
## 27	No	Yes							
## 28	Yes	No							
## 29	Yes	Yes							
## 30	Yes	Yes							
## 31	Yes	No							
## 32	Yes	Yes							
## 33	No	Yes							
## 34	Yes	Yes							
## 35	Yes	Yes							
## 36	No	Yes							
## 37	No	No							
## 38	Yes	Yes							
## 39	Yes	No							
## 40	No	No							
## 41	No	No							
## 42	Yes	No							
## 43	Yes	No							
## 44	Yes	Yes							
## 45	Yes	Yes							

## 46	Yes	Yes
## 47	No	Yes
## 48	Yes	No
## 49	Yes	No
## 50	Yes	No
## 51	Yes	Yes
## 52	Yes	No
## 53	Yes	Yes
## 54	Yes	Yes
## 55	No	Yes
## 56	Yes	Yes
## 57	Yes	No
## 58	Yes	No
## 59	Yes	Yes
## 60	Yes	No
## 61	Yes	Yes
## 62	No	No
## 63	Yes	Yes
## 64	Yes	Yes
## 65	No	Yes
## 66	No	No
## 67	Yes	No
## 68	Yes	Yes
## 69	Yes	Yes
## 70	Yes	No
## 71	Yes	Yes
## 72	No	Yes
## 73	Yes	No
## 74	No	Yes
## 75	No	Yes
## 76	No	Yes
## 77	Yes	Yes
## 78	No	Yes
## 79	Yes	Yes
## 80	Yes	No
## 81	Yes	Yes
## 82	Yes	No
## 83	Yes	Yes
## 84	Yes	Yes
## 85	No	No
## 86	No	No
## 87	Yes	No
## 88	No	Yes
## 89	Yes	Yes
## 90	No	No
## 91	No	No
## 92	Yes	Yes
## 93	Yes	No
## 94	Yes	No
## 95	Yes	Yes
## 96	Yes	Yes
## 97	No	Yes
## 98	Yes	Yes
## 99	No	Yes

##	100	No	Yes
##	101	No	Yes
##	102	Yes	No
##	103	No	No
##	104	Yes	Yes
##	105	Yes	No
##	106	Yes	Yes
##	107	No	No
##	108	Yes	No
##	109	Yes	No
##	110	No	No
##	111	Yes	Yes
##	112	Yes	Yes
##	113	Yes	Yes
##	114	Yes	Yes
##	115	Yes	Yes
##	116	Yes	No
##	117	No	No
##	118	Yes	No
##	119	Yes	Yes
##	120	Yes	Yes
##	121	Yes	Yes
##	122	Yes	Yes
##	123	Yes	Yes
##	124	No	Yes
##	125	Yes	No
##	126	No	No
##	127	Yes	Yes
##	128	Yes	Yes
##	129	Yes	Yes
##	130	No	Yes
##	131	Yes	Yes
##	132	Yes	No
##	133	Yes	Yes
##	134	Yes	Yes
##	135	Yes	No
##	136	No	Yes
##	137	No	No
##	138	Yes	No
##	139	Yes	Yes
##	140	No	Yes
##	141	Yes	Yes
##	142	Yes	No
##	143	Yes	No
##	144	Yes	Yes
##	145	No	No
##	146	Yes	Yes
##	147	Yes	No
##	148	No	Yes
##	149	No	Yes
##	150	Yes	Yes
##	151	No	Yes
##	152	No	Yes
##	153	No	No

##	154	No	Yes
##	155	No	Yes
##	156	Yes	No
##	157	Yes	No
##	158	No	Yes
##	159	No	Yes
##	160	No	No
##	161	No	No
##	162	No	Yes
##	163	Yes	No
##	164	No	No
##	165	No	Yes
##	166	Yes	Yes
##	167	Yes	Yes
##	168	Yes	No
##	169	Yes	No
##	170	Yes	Yes
##	171	Yes	Yes
##	172	Yes	Yes
##	173	Yes	Yes
##	174	Yes	Yes
##	175	No	No
##	176	Yes	No
##	177	No	Yes
##	178	Yes	Yes
##	179	No	Yes
##	180	Yes	Yes
##	181	Yes	Yes
##	182	Yes	No
##	183	Yes	No
##	184	Yes	Yes
##	185	No	Yes
##	186	Yes	Yes
##	187	No	No
##	188	Yes	No
##	189	Yes	No
##	190	No	Yes
##	191	No	Yes
##	192	Yes	Yes
##	193	No	No
##	194	Yes	Yes
##	195	Yes	Yes
##	196	Yes	Yes
##	197	Yes	Yes
##	198	Yes	No
##	199	Yes	Yes
##	200	Yes	Yes
##	201	No	No
##	202	Yes	No
##	203	No	Yes
##	204	Yes	No
##	205	Yes	No
##	206	Yes	No
##	207	Yes	Yes

##	208	No	No
##	209	Yes	No
##	210	No	Yes
##	211	No	Yes
##	212	Yes	Yes
##	213	Yes	Yes
##	214	Yes	Yes
##	215	Yes	Yes
##	216	Yes	Yes
##	217	Yes	No
##	218	No	No
##	219	Yes	Yes
##	220	Yes	Yes
##	221	Yes	Yes
##	222	Yes	No
##	223	Yes	Yes
##	224	Yes	Yes
##	225	No	No
##	226	Yes	No
##	227	Yes	No
##	228	Yes	Yes
##	229	No	Yes
##	230	No	No
##	231	No	No
##	232	No	No
##	233	Yes	Yes
##	234	No	Yes
##	235	No	Yes
##	236	Yes	Yes
##	237	Yes	Yes
##	238	Yes	Yes
##	239	Yes	No
##	240	Yes	Yes
##	241	Yes	No
##	242	Yes	No
##	243	No	No
##	244	Yes	Yes
##	245	Yes	No
##	246	No	Yes
##	247	Yes	Yes
##	248	Yes	No
##	249	Yes	Yes
##	250	Yes	No
##	251	Yes	Yes
##	252	Yes	Yes
##	253	Yes	No
##	254	No	Yes
##	255	Yes	Yes
##	256	Yes	Yes
##	257	Yes	No
##	258	Yes	Yes
##	259	No	No
##	260	No	Yes
##	261	Yes	Yes

##	262	Yes	Yes
##	263	Yes	Yes
##	264	Yes	Yes
##	265	Yes	Yes
##	266	Yes	Yes
##	267	No	Yes
##	268	No	Yes
##	269	Yes	No
##	270	Yes	No
##	271	Yes	No
##	272	Yes	No
##	273	Yes	No
##	274	Yes	Yes
##	275	Yes	Yes
##	276	Yes	Yes
##	277	Yes	Yes
##	278	Yes	Yes
##	279	No	Yes
##	280	Yes	Yes
##	281	Yes	Yes
##	282	No	Yes
##	283	Yes	No
##	284	No	No
##	285	No	No
##	286	Yes	Yes
##	287	No	Yes
##	288	Yes	Yes
##	289	No	No
##	290	Yes	Yes
##	291	No	Yes
##	292	Yes	No
##	293	Yes	Yes
##	294	Yes	No
##	295	Yes	Yes
##	296	No	Yes
##	297	Yes	Yes
##	298	Yes	Yes
##	299	Yes	No
##	300	No	Yes
##	301	Yes	Yes
##	302	Yes	Yes
##	303	Yes	Yes
##	304	Yes	Yes
##	305	Yes	Yes
##	306	Yes	Yes
##	307	Yes	Yes
##	308	Yes	No
##	309	Yes	Yes
##	310	Yes	Yes
##	311	Yes	Yes
##	312	Yes	Yes
##	313	Yes	Yes
##	314	Yes	No
##	315	Yes	Yes

## 316	Yes	Yes
## 317	Yes	Yes
## 318	No	No
## 319	No	Yes
## 320	No	Yes
## 321	Yes	Yes
## 322	Yes	No
## 323	Yes	Yes
## 324	Yes	Yes
## 325	Yes	Yes
## 326	Yes	Yes
## 327	Yes	No
## 328	Yes	Yes
## 329	Yes	Yes
## 330	Yes	Yes
## 331	No	No
## 332	Yes	Yes
## 333	Yes	Yes
## 334	Yes	Yes
## 335	Yes	Yes
## 336	Yes	Yes
## 337	Yes	No
## 338	Yes	No
## 339	Yes	No
## 340	Yes	Yes
## 341	Yes	No
## 342	No	No
## 343	No	Yes
## 344	Yes	Yes
## 345	No	Yes
## 346	Yes	No
## 347	No	No
## 348	No	No
## 349	Yes	Yes
## 350	No	Yes
## 351	No	Yes
## 352	No	Yes
## 353	Yes	Yes
## 354	No	Yes
## 355	Yes	Yes
## 356	Yes	No
## 357	Yes	No
## 358	Yes	Yes
## 359	Yes	Yes
## 360	Yes	Yes
## 361	No	Yes
## 362	No	Yes
## 363	Yes	Yes
## 364	Yes	No
## 365	Yes	Yes
## 366	No	No
## 367	No	Yes
## 368	Yes	No
## 369	No	Yes

```
## 370    Yes Yes
## 371    Yes Yes
## 372    Yes No
## 373     No No
## 374    Yes No
## 375    Yes Yes
## 376    Yes No
## 377    Yes Yes
## 378     No No
## 379    Yes Yes
## 380    Yes No
## 381    Yes Yes
## 382    Yes Yes
## 383    Yes Yes
## 384    Yes No
## 385    Yes Yes
## 386    Yes Yes
## 387    Yes No
## 388     No Yes
## 389    Yes Yes
## 390    Yes Yes
## 391    Yes Yes
## 392    Yes No
## 393    Yes Yes
## 394     No Yes
## 395    Yes Yes
## 396    Yes Yes
## 397     No Yes
## 398    Yes Yes
## 399    Yes Yes
## 400    Yes Yes
```

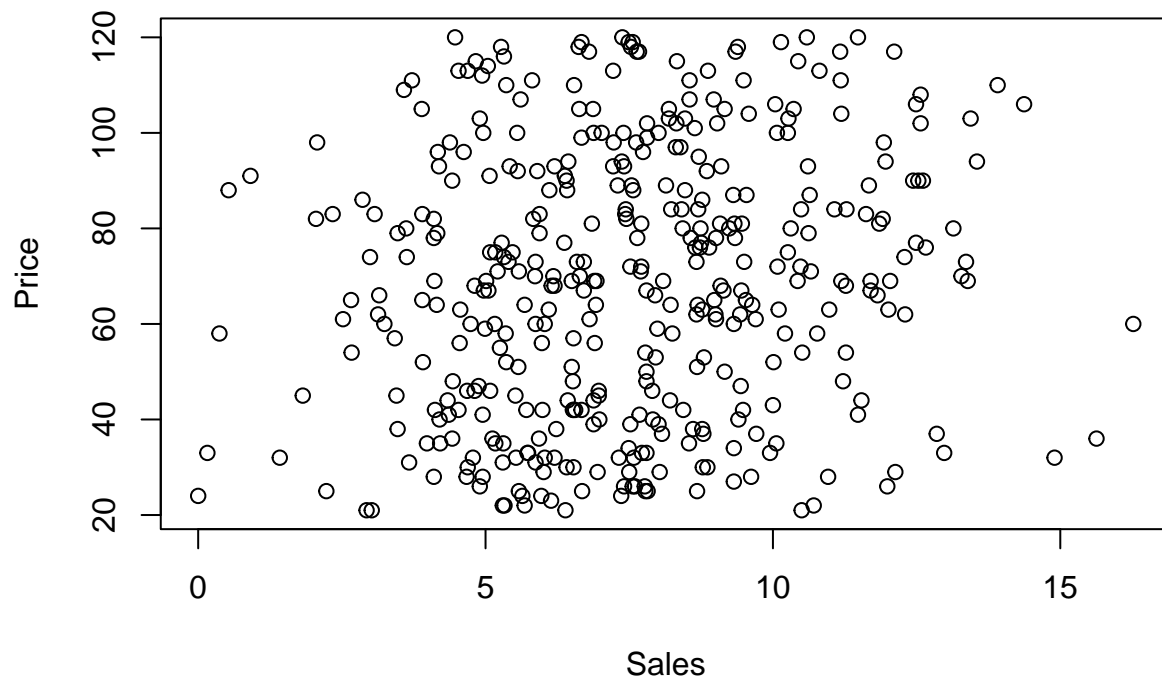
```
IQR(Carseats$Sales)
```

```
## [1] 3.93
```

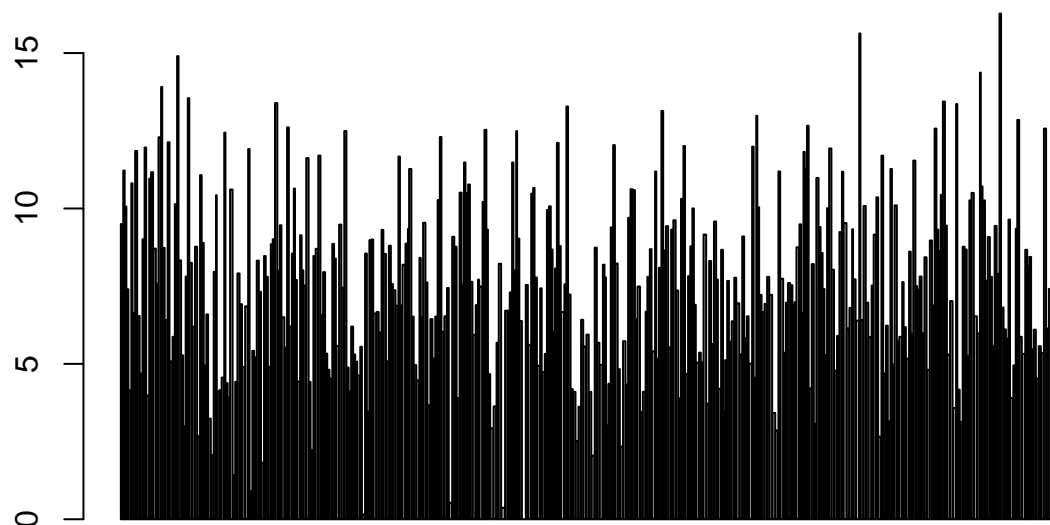
```
#barplot and scatterplot between sales and price
```

```
plot(Carseats$Sales, Carseats$Income, main = "Scatterplot", xlab = "Sales", ylab = "Price")
```


Scatterplot



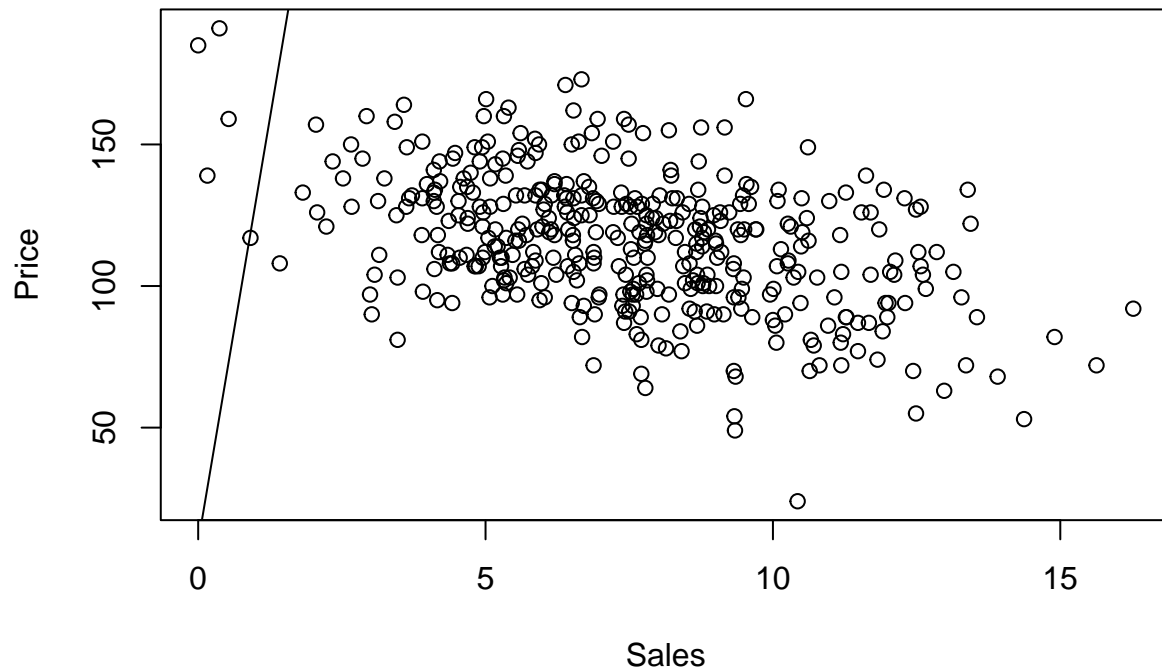
```
barplot(Carseats$Sales,Carseats$Price)
```



```
#scatterplot between sales and price using abline
```

```
plot(Carseats$Sales,Carseats$Price,main="scatterplot",xlab="Sales",ylab="Price")  
abline(Carseats$Sales,Carseats$Price)
```

scatterplot



```
#correlation between sales and price
```

```
cor(Carseats$Sales,Carseats$Price)
```

```
## [1] -0.4449507
```

```
#maximum value of advertising attribute
```

```
max(Carseats$Advertising)
```

```
## [1] 29
```