Marketing Data Science

Modeling Techniques in Predictive Analytics
with R and Python

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C.10   Studenmund's Restaurants

Managers of a nationwide restaurant chain, which we will call Studenmund's Restaurants, want to find new restaurant locations. Gross restaurant sales and the number of competitors within a two-mile radius are noted at existing restaurant locations. Census data for population and income are also collected for these locations. Table C.11 shows the variable names and definitions, and Table C.12 shows the observed data from thirty-three restaurants.

Researchers at Studenmund's wonder if it is possible to define a model for predicting restaurant sales. Could such a model be trusted to yield accurate predictions? Could the model be used to pick future restaurant locations?

Table C.11.   *Variables for Studenmund's Restaurants*

Variable	*Description*
sales	Gross sales volume at the restaurant location (This is likely to be the number of customers/sales receipts in a year. Or it could be average monthly sales dollars or some other measure relating to sales revenue.)
competition	Number of direct competitors within a two-mile radius of the restaurant location
population	Number of people living within a three-mile radius of the restaurant location
income	Average household income of people living within a three-mile radius of the restaurant location

Table C.12. *Data for Studenmund's Restaurants*

sales	competition	population	income
107,919	3	65,044	13,240
118,866	5	101,376	22,554
98,579	7	124,989	16,916
122,015	2	55,249	20,967
152,827	3	73,775	19,576
91,259	5	48,484	15,039
123,550	8	138,809	21,857
160,931	2	50,244	26,435
98,496	6	104,300	24,024
108,052	2	37,852	14,987
144,788	3	66,921	30,902
164,571	4	166,332	31,573
105,564	3	61,951	19,001
102,568	5	100,441	20,058
103,342	2	39,462	16,194
127,030	5	139,900	21,384
166,755	6	171,740	18,800
125,343	6	149,894	15,289
121,886	3	57,386	16,702
134,594	6	185,105	19,093
152,937	3	114,520	26,502
109,622	3	52,933	18,760
149,884	5	203,500	33,242
98,388	4	39,334	14,988
140,791	3	95,120	18,505
101,260	3	49,200	16,839
139,517	4	113,566	28,915
115,236	9	194,125	19,033
136,749	7	233,844	19,200
105,067	7	83,416	22,833
136,872	6	183,953	14,409
117,146	3	60,457	20,307
163,538	2	65,065	20,111