

Relatório de Validação Estatística do Modelo de Regressão

Sumário do Modelo

OLS Regression Results

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Dep. Variable: charges R-squared: 0.739

Model: OLS Adj. R-squared: 0.726

Method: Least Squares F-statistic: 60.05

Date: Mon, 27 May 2024 Prob (F-statistic): 3.56e-67

Time: 17:42:21 Log-Likelihood: -2698.7

No. Observations: 268 AIC: 5423.

Df Residuals: 255 BIC: 5470.

Df Model: 12

Covariance Type: nonrobust

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	coef	std err	t	P> t	[0.025	0.975]

const	0.1135	0.013	9.020	0.000	0.089	0.138
age	236.1967	25.834	9.143	0.000	185.322	287.072
bmi	288.4114	64.088	4.500	0.000	162.203	414.620
children	661.7290	508.686	1.301	0.194	-340.032	1663.490
born_year	-6.4945	1.496	-4.340	0.000	-9.441	-3.548
has_children	2606.1661	2126.913	1.225	0.222	-1582.386	6794.718
sex_male	368.4760	1091.997	0.337	0.736	-1782.006	2518.958

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smoker_yes	2.318e+04	945.115	24.525	0.000	2.13e+04	2.5e+04
region_northwest	983.5124	1045.717	0.941	0.348	-1075.829	3042.853
region_southeast	-207.5042	1713.838	-0.121	0.904	-3582.583	3167.575
region_southwest	-491.4453	1032.598	-0.476	0.635	-2524.951	1542.061
cluster_1	-193.2954	2259.178	-0.086	0.932	-4642.318	4255.727
cluster_2	2180.4980	2022.932	1.078	0.282	-1803.283	6164.279
cluster_3	-500.5069	2254.470	-0.222	0.824	-4940.259	3939.245

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Omnibus:	78.878	Durbin-Watson:	1.961
Prob(Omnibus):	0.000	Jarque-Bera (JB):	178.295
Skew:	1.423	Prob(JB):	1.92e-39
Kurtosis:	5.806	Cond. No.	7.58e+18

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Notes:

[1] Standard Errors assume that the covariance matrix of the errors is correctly specified.

[2] The smallest eigenvalue is 1.83e-29. This might indicate that there are strong multicollinearity problems or that the design matrix is singular.

Intervalos de Confiança

	lower_bound	upper_bound
0	9023.414469	13365.128830

Relatório de Validação Estatística do Modelo de Regressão

1	20776.136198	26284.512735
2	5238.391153	9456.254685
3	32578.386091	38495.675935
4	3053.073860	10362.902011
5	8194.608880	12517.728907
6	33997.294964	39131.594433
7	8757.939077	13275.317671
8	3258.234554	7778.597207
9	4925.378310	9630.559408
10	4498.752588	9144.294181
11	7128.625492	11754.466086
12	24432.091343	30827.280111
13	6644.236042	12943.616600
14	841.265761	5226.092074
15	3820.143979	8466.489280
16	13892.197741	18744.367853
17	9345.699406	14265.444456
18	9140.001003	15321.097873
19	2734.537690	7210.712162
20	2829.445290	8021.873492
21	6774.633142	13253.162800
22	2183.588701	7219.501276
23	12297.515977	16927.862522
24	7551.868596	13167.810750

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25	1838.737385	6325.762225
26	33562.906709	38974.437542
27	7898.581868	12963.934131
28	8962.621008	13501.220042
29	30532.807597	35828.113722
30	5155.230242	9954.550695
31	31709.464440	36910.556650
32	11509.398268	17357.109989
33	5833.004027	10293.988722
34	11840.673940	16601.737027
35	30555.458423	36617.740215
36	9733.017007	13586.593701
37	6591.469901	12114.226683
38	8520.977183	14175.316540
39	9623.918358	15361.715514
40	1475.636121	6167.167116
41	8220.700163	12208.117961
42	7433.884401	11520.335064
43	4164.172910	8253.272295
44	29603.164719	35307.760159
45	7763.649309	12201.919926
46	34945.608902	41382.628114
47	26745.854820	32862.951374
48	22471.287862	27837.915768

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49	4574.619937	8900.333442
50	-1596.336306	3591.222133
51	7367.676497	11764.254976
52	36959.905428	42510.852521
53	-1378.970010	3818.009338
54	25949.276594	32221.083536
55	2745.057385	10224.148560
56	10134.047644	14331.765715
57	-550.058021	4152.446312
58	25930.151123	31323.525368
59	6592.083128	10801.717831
60	9921.375061	14519.924880
61	4100.671833	8848.577976
62	9915.003118	14387.397344
63	148.420539	4634.985359
64	2276.087815	6644.971686
65	-795.857086	3764.044872
66	4590.785704	9506.439641
67	24246.054543	29643.165446
68	28428.140861	33445.212760
69	6475.555688	11189.067540
70	1643.499560	6208.331400
71	2736.084186	7153.826301
72	7257.531028	11130.053983

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73	27441.018359	33984.277569
74	11282.503811	17132.246224
75	25879.288554	31791.986008
76	6887.364912	11289.138373
77	8540.241122	13271.857675
78	11891.959678	17821.620109
79	2189.945544	7738.415769
80	-690.568048	4089.539929
81	6085.221989	11812.963276
82	66.612419	5188.702997
83	6092.047411	11734.984526
84	6422.481776	11397.005837
85	13510.626725	18977.144091
86	27921.804271	33316.076984
87	2604.718950	9910.431878
88	24701.101494	30032.574655
89	5649.437934	10918.519363
90	8865.961052	13258.022896
91	24098.348163	29661.472403
92	9738.697169	14633.671658
93	1386.985043	6080.420032
94	8056.778341	12860.709354
95	6324.063711	10305.230148
96	528.167323	5404.826980

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97	2469.283434	7069.159656
98	13510.912231	19223.262609
99	12031.598943	16410.921734
100	10914.546948	16397.562699
101	7716.224294	12243.433579
102	2930.425243	7199.007130
103	786.828683	5353.884115
104	703.462361	5350.194256
105	4070.105120	8237.351420
106	5051.972926	10287.697140
107	10010.288087	14875.863446
108	9630.448791	14292.111445
109	142.836235	5338.612986
110	6448.651818	10506.380080
111	-53.936488	4410.755672
112	-1025.649776	4781.242237
113	12347.823740	17745.487581
114	8051.659973	12419.213925
115	1908.886067	6589.152553
116	11596.965086	18088.242217
117	29607.728368	34426.189370
118	7517.298649	13560.506020
119	1373.015882	7703.912606
120	7463.796919	12799.535822

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121	6628.845842	10997.465186
122	29594.372856	34920.055718
123	5241.190646	9903.528491
124	23658.896331	28972.540149
125	6584.202456	14584.493563
126	6897.975366	11125.729526
127	7646.769370	11686.770734
128	10763.952008	15330.161912
129	357.201917	5067.007008
130	4378.571196	8534.715413
131	-2369.538143	2485.363039
132	4216.505142	10101.101916
133	7031.704708	11067.341699
134	7656.889906	13294.376414
135	5909.186197	10164.328070
136	31894.078736	37412.552761
137	8324.191010	13028.084912
138	11148.441454	15865.738903
139	9711.343948	14213.178286
140	8398.146767	14269.853318
141	7063.722058	13265.611931
142	10556.604704	14738.982016
143	20805.901229	26228.330464
144	-1286.921896	3916.312724

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145	9614.717328	14189.985401
146	-260.449175	4276.680843
147	5297.763681	9629.928751
148	6695.414837	15031.479209
149	12773.696412	17344.319686
150	2213.958156	6529.726932
151	-639.750157	4323.344238
152	23878.204530	29244.822810
153	9386.434285	14407.973173
154	1569.156236	6461.769095
155	28614.741186	34949.577619
156	-5.204709	4663.352880
157	13478.217745	18816.550332
158	8473.751140	12647.091057
159	3442.811707	7998.388076
160	8009.897316	12519.231125
161	4046.792620	8704.769598
162	11680.909397	16504.550764
163	5019.203764	10967.770179
164	9303.938882	13782.027438
165	11388.765482	15689.591748
166	32640.106258	38368.598420
167	10706.720479	16097.764535
168	11647.578699	16315.423799

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169	3019.838141	7937.716103
170	7523.850881	12252.926457
171	9217.828104	15373.921005
172	36642.938968	42131.044854
173	8213.341846	14431.440616
174	6958.001279	11312.761588
175	8378.869040	12234.273099
176	11846.608013	16546.978788
177	9823.890658	14039.142948
178	36299.515797	42993.821540
179	10389.525276	15847.139986
180	6988.116009	11337.445017
181	6717.205562	11130.421660
182	-3832.404377	1283.308262
183	6001.600964	11542.979196
184	-304.503681	4289.340103
185	23351.202293	28925.276803
186	3901.117202	8274.522674
187	24369.504257	30302.800875
188	5732.202041	10087.205729
189	9699.650164	14649.002096
190	4436.182558	8537.899553
191	24744.118278	29949.772391
192	28422.197500	33425.370734

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193 35636.930543 41062.332837

194 8307.626167 12579.078459

195 3894.816988 10074.590909

196 8264.428928 12519.248296

197 11421.501278 16201.359078

198 22136.007504 28251.956788

199 7750.804688 11646.752871

200 6058.149950 10322.737856

201 5330.023914 9876.674475

202 4485.320229 8534.904729

203 10406.791082 15015.166840

204 32008.355678 37537.382223

205 11862.859922 16927.615501

206 4625.706571 9706.800534

207 -1894.489248 3530.015570

208 7637.211431 11896.533956

209 8875.066477 14566.556142

210 4990.550166 9510.746911

211 32794.793432 37860.879122

212 12091.040011 17124.946730

213 9589.354365 14031.873912

214 4876.247654 10564.460988

215 11562.094041 15917.618079

216 7765.996584 12227.604793

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217	9983.713633	16104.825172
218	7041.823088	12546.237199
219	33714.075574	39058.063257
220	19849.960655	25878.080487
221	3256.751061	8068.788355
222	5077.543899	9472.853866
223	11828.989828	16188.737081
224	30526.048674	36201.924286
225	9602.199781	13850.911459
226	27082.518454	32646.216264
227	29387.110221	34588.366930
228	7312.343979	12947.388563
229	191.534316	5029.083916
230	8799.578930	12633.300088
231	-2097.294521	2695.287760
232	4662.744543	9799.748644
233	2264.412689	7251.506623
234	13428.092652	19917.602812
235	9110.650287	13429.043806
236	32143.263685	37710.936072
237	9293.145336	14152.901646
238	12280.779350	16891.185129
239	2848.788411	7672.149660
240	8841.336930	13432.414726

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241	4783.682873	9321.152084
242	5849.504336	10089.592717
243	2145.483119	6378.550281
244	9146.061043	13817.331871
245	8845.792124	12809.887775
246	5715.092339	10950.036881
247	10839.701267	16821.247486
248	23841.995294	28997.818526
249	5658.493257	10669.821461
250	8752.384461	13484.888898
251	8756.320590	13241.483516
252	-753.526556	4341.457364
253	30773.359201	36131.737472
254	9548.419520	14424.238885
255	10007.730564	14426.496190
256	3164.195421	7757.714822
257	9207.362056	13768.357534
258	-207.497601	4828.308014
259	1453.736242	6269.720446
260	9902.231892	16202.100215
261	9347.674258	13439.748160
262	4178.523867	8837.829934
263	10007.203743	14486.261286
264	20307.423596	26034.141849

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265 -1929.809144 2864.062305

266 24673.795310 30314.674744

267 7924.783449 14064.908498