

Relatório de Validação Estatística do Modelo de Regressão

Sumário do Modelo

OLS Regression Results

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Dep. Variable: charges R-squared: 0.967

Model: OLS Adj. R-squared: 0.965

Method: Least Squares F-statistic: 622.8

Date: Sun, 02 Jun 2024 Prob (F-statistic): 3.40e-181

Time: 15:59:18 Log-Likelihood: -2421.4

No. Observations: 268 AIC: 4869.

Df Residuals: 255 BIC: 4916.

Df Model: 12

Covariance Type: nonrobust

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	coef	std err	t	P> t	[0.025	0.975]
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const	0.1162	0.006	18.824	0.000	0.104	0.128
age	221.3131	12.730	17.385	0.000	196.243	246.383
bmi	49.0785	23.612	2.079	0.039	2.580	95.577
children	572.0310	179.629	3.185	0.002	218.285	925.777
born_year	13.9247	0.652	21.365	0.000	12.641	15.208
has_children	-410.5115	434.097	-0.946	0.345	-1265.383	444.360
sex_male	-458.0057	264.220	-1.733	0.084	-978.337	62.326

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smoker_yes	3376.0889	582.210	5.799	0.000	2229.536	4522.642
region_northwest	221.1183	372.426	0.594	0.553	-512.303	954.540
region_southeast	-748.2554	368.735	-2.029	0.043	-1474.410	-22.101
region_southwest	-379.4844	367.994	-1.031	0.303	-1104.179	345.210
cluster_1	-2.946e+04	742.920	-39.649	0.000	-3.09e+04	-2.8e+04
cluster_2	-1.714e+04	621.837	-27.567	0.000	-1.84e+04	-1.59e+04
cluster_3	-3.14e+04	767.001	-40.937	0.000	-3.29e+04	-2.99e+04

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Omnibus:	172.519	Durbin-Watson:	1.915
Prob(Omnibus):	0.000	Jarque-Bera (JB):	2407.922
Skew:	2.324	Prob(JB):	0.00
Kurtosis:	16.929	Cond. No.	7.60e+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	9781.947847	11416.987025

## Relatório de Validação Estatística do Modelo de Regressão

1	34671.624206	36885.598656
2	5679.621760	7364.352029
3	40936.172853	42809.396968
4	737.723758	3100.378838
5	10654.013617	12112.841875
6	42195.899120	44162.883264
7	9152.599422	10705.023374
8	17126.345687	19658.512766
9	6155.150068	7969.270573
10	4207.060879	5794.599391
11	9846.946148	11448.953846
12	35306.145880	37443.765862
13	4289.603944	5926.378808
14	2056.199274	3540.444707
15	2845.648655	4409.693825
16	13400.942305	14976.371176
17	6638.963181	8586.677108
18	20257.892284	23079.372492
19	3124.647321	4578.136814
20	1900.222394	3666.350118
21	2456.097947	4375.420399
22	16105.831965	18769.938414
23	12219.615221	13691.653662
24	8928.586493	10425.590201

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25	4217.199672	5767.347796
26	27917.576726	30139.096014
27	4364.203946	6166.759579
28	9357.921608	10905.152917
29	42163.559727	44349.133696
30	4417.359153	5983.326219
31	25003.666439	27187.328971
32	11310.301364	12791.279896
33	5237.013495	6813.372315
34	11266.195470	12850.937738
35	40863.392253	43130.086288
36	9305.660178	10800.682048
37	8566.028984	10035.563022
38	4625.536508	6236.365977
39	10505.687979	12141.426416
40	1228.180978	2750.986004
41	37556.859907	40530.662215
42	6352.752455	7900.635114
43	5017.287733	6462.847701
44	26709.959552	28925.460796
45	9063.521301	10691.697192
46	42221.337077	44333.718314
47	36923.398387	38891.908997
48	19251.051703	21231.903745

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49	20091.122879	22280.780418
50	200.249079	1694.344153
51	9830.861544	11343.379675
52	45828.523974	48175.353140
53	237.447010	1732.727142
54	24122.153493	26335.199208
55	3094.889647	5709.479524
56	11634.547112	13089.003902
57	1391.742128	2814.354271
58	21211.355098	23398.389305
59	6218.225928	7785.415185
60	11016.839361	12553.611852
61	4738.833012	6290.737669
62	22374.037402	24579.853761
63	1277.411084	2772.025333
64	3546.717439	4978.321371
65	483.212396	2001.259705
66	5007.081515	6732.764918
67	19714.637700	21881.518023
68	22772.823852	24752.756836
69	4136.858236	5777.276786
70	3604.514399	5116.365405
71	17604.311235	19921.251604
72	5827.945755	7228.655840

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73	37366.553926	39812.299686
74	10824.285309	12875.819707
75	35934.070034	38220.043160
76	5030.641828	6583.632405
77	11808.183824	13460.328231
78	12172.845765	13694.507039
79	4599.779313	6424.714176
80	1536.408796	3059.326114
81	10203.385101	11902.028760
82	942.821716	2548.011181
83	5087.025466	6490.220421
84	6519.142467	8173.430882
85	11067.816970	12966.741446
86	23142.306201	25367.205088
87	4108.665045	6684.165411
88	36515.992950	38691.621897
89	10805.473903	12447.174330
90	10016.663757	11498.554059
91	8759.018133	11428.890986
92	11560.807474	13019.905490
93	850.933085	2399.163917
94	9306.085226	11020.084830
95	6652.173242	8202.124880
96	1359.461038	2930.476864

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97	2228.660670	3717.863881
98	11585.526451	13559.246460
99	10538.638730	12065.497487
100	9536.110391	10979.162660
101	10536.174506	12056.988485
102	4580.937124	6070.159795
103	14500.435928	17037.390934
104	1097.354576	2611.389764
105	4546.017214	5929.609132
106	3137.953306	4941.729911
107	11558.225022	13169.912908
108	9479.136413	11086.070934
109	998.851620	2485.584328
110	5838.987156	7306.018932
111	1440.374892	2941.297775
112	1347.628450	3317.520454
113	11193.188712	13006.876745
114	8871.394103	10414.315153
115	3194.306149	4750.096907
116	9874.458057	11669.728486
117	39614.789099	41507.474447
118	5624.056238	7596.605869
119	935.153013	2587.192508
120	10862.312942	12734.187720

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121	8741.567249	10288.443883
122	25913.042895	27994.006995
123	4029.335146	5632.794574
124	20134.031067	22072.814614
125	5225.770140	7800.556830
126	6547.189899	8177.350123
127	9376.502149	10830.466449
128	11113.555962	12646.796589
129	1681.119767	3186.598625
130	4145.301997	5546.976607
131	567.895167	2048.358516
132	5333.389731	7053.070619
133	6389.124441	7912.233389
134	6143.608138	7743.144295
135	19972.429662	22224.502957
136	26190.341805	28442.752052
137	9579.256687	11159.024223
138	21541.368443	23899.646173
139	10323.849916	11829.942595
140	11022.303456	12571.885814
141	22168.784830	24736.870788
142	11539.635597	12992.936818
143	6842.377853	9496.413343
144	252.864597	1749.701377



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145 11529.228598 13046.959208

146 1199.980311 2718.907245

147 4871.715888 6387.012313

148 9171.384444 11821.294908

149 13051.987493 14626.469336

150 3660.065942 5094.321197

151 1390.689076 3044.598289

152 18440.438013 20655.199084

153 5866.460796 7748.209068

154 4031.492792 5721.443278

155 38119.782050 40107.216611

156 15743.407409 18244.450363

157 14167.590303 15842.281861

158 22203.604213 24478.432686

159 3114.918666 4633.547705

160 9892.544626 11458.790101

161 8738.212059 10211.027638

162 12026.391841 13617.427828

163 3864.870435 5445.449067

164 11785.469194 13260.124059

165 12368.316450 13734.445811

166 27667.865099 30021.170367

167 10393.886362 12262.784426

168 12161.722079 13713.788935

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169	1608.517273	3285.638840
170	10817.670590	12408.731618
171	11111.572555	13191.462060
172	45462.542158	47758.406255
173	8907.436306	10559.113457
174	9419.315504	10944.022259
175	6463.462701	7933.535082
176	12358.063903	13922.898840
177	11579.366070	13041.610839
178	43623.573284	45916.684635
179	8929.680757	10406.045998
180	9425.061499	10947.601182
181	5704.638499	7302.904756
182	285.641813	1877.126351
183	6165.862926	7688.577584
184	697.240492	2219.765008
185	18860.168019	21132.830628
186	3156.987285	4583.144275
187	38765.094606	41280.593776
188	8898.093740	10241.016668
189	11184.749956	12822.425858
190	18217.686567	20462.201713
191	36228.773971	38380.358923
192	38242.944516	40182.012283

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193	44030.629513	46179.828040
194	6682.687012	8242.475538
195	2700.644188	4233.997436
196	9827.224445	11295.911955
197	10771.055124	12363.000949
198	7868.837415	10766.588430
199	5560.067603	6969.176726
200	6172.537833	7731.385400
201	4945.600648	6543.352228
202	5074.787615	6507.921924
203	11155.520869	12689.318433
204	26065.202702	28340.385437
205	12004.303796	13707.607365
206	8801.786707	10631.852257
207	2523.629282	4356.813672
208	9055.003996	10599.361986
209	10169.405576	11641.039178
210	6130.202489	7786.053533
211	25535.612668	27701.009170
212	13047.004861	14670.545492
213	9676.350508	11204.622527
214	5169.180653	6744.036453
215	11862.366595	13374.054946
216	10874.653948	12361.606992

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217 23162.103739 25564.749549

218 6354.562563 8376.981382

219 27613.162025 29819.105632

220 18131.633315 20379.984810

221 1995.754935 3625.380366

222 8778.844898 10144.320025

223 12267.388719 13663.044780

224 25659.498528 27877.922565

225 9365.759506 11017.791684

226 36470.116895 38604.662531

227 40260.031847 42330.439588

228 6075.787043 7654.015539

229 1308.318073 2860.395886

230 6561.461412 8009.892765

231 1283.580123 2743.442840

232 8172.099645 9694.689326

233 2020.391249 3694.275519

234 9819.258073 11800.429491

235 7239.782359 8952.459358

236 42131.077500 44304.993140

237 10814.847782 12279.514982

238 12009.701991 13525.434625

239 5513.046650 7243.361458

240 9532.044051 11103.511110

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241	3772.547722	5311.154761
242	5500.967173	6999.057773
243	2336.969292	3750.371397
244	11605.493349	13159.709916
245	9354.819097	10765.691408
246	8394.130287	10325.337653
247	11186.382153	12710.050896
248	21695.515565	23581.285884
249	4192.601477	5925.098443
250	11245.828500	12639.378687
251	11524.344005	13003.898496
252	1934.355440	3680.059132
253	41503.926247	43655.841671
254	11194.398302	12653.936836
255	9884.991927	11511.385459
256	2850.952281	4388.531964
257	9244.390244	10827.514825
258	908.036863	2474.823291
259	2205.411569	3698.500290
260	12045.357416	13716.798017
261	22057.303743	24247.660779
262	5658.284175	7504.925090
263	9363.050300	11020.733389
264	4982.878776	7890.791807

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265 1640.046862 3108.556652

266 22143.646572 24118.270336

267 10216.082443 11856.272263