

DS-MAJOR-MAR-DS-03-MLB2

Name: Garagapati Prudhvija

Take any Dataset of your choice ,perform EDA(Exploratory Data Analysis) and apply a suitable Classifier, Regressor or Clusterer and calculate the accuracy of the model.

Exploratory Data Analysis USING AN REGRESSION –

DATASET:

age	sex	bmi	children	smoker	region	charges
19	female	27.9	0	yes	southwest	16884.92
18	male	33.77	1	no	southeast	1725.552
28	male	33	3	no	southeast	4449.462
33	male	22.705	0	no	northwest	21984.47
32	male	28.88	0	no	northwest	3866.855
31	female	25.74	0	no	southeast	3756.622
46	female	33.44	1	no	southeast	8240.59
37	female	27.74	3	no	northwest	7281.506
37	male	29.83	2	no	northeast	6406.411
60	female	25.84	0	no	northwest	28923.14
25	male	26.22	0	no	northeast	2721.321
62	female	26.29	0	yes	southeast	27808.73
23	male	34.4	0	no	southwest	1826.843
56	female	39.82	0	no	southeast	11090.72
27	male	42.13	0	yes	southeast	39611.76
19	male	24.6	1	no	southwest	1837.237
52	female	30.78	1	no	northeast	10797.34
23	male	23.845	0	no	northeast	2395.172
56	male	40.3	0	no	southwest	10602.39
30	male	35.3	0	yes	southwest	36837.47
60	female	36.005	0	no	northeast	13228.85
30	female	32.4	1	no	southwest	4149.736
18	male	34.1	0	no	southeast	1137.011
34	female	31.92	1	yes	northeast	37701.88
37	male	28.025	2	no	northwest	6203.902
59	female	27.72	3	no	southeast	14001.13
63	female	23.085	0	no	northeast	14451.84
55	female	32.775	2	no	northwest	12268.63

23	male	17.385	1	no	northwest	2775.192
31	male	36.3	2	yes	southwest	38711
22	male	35.6	0	yes	southwest	35585.58
18	female	26.315	0	no	northeast	2198.19
19	female	28.6	5	no	southwest	4687.797
63	male	28.31	0	no	northwest	13770.1
28	male	36.4	1	yes	southwest	51194.56
19	male	20.425	0	no	northwest	1625.434
62	female	32.965	3	no	northwest	15612.19
26	male	20.8	0	no	southwest	2302.3
35	male	36.67	1	yes	northeast	39774.28
60	male	39.9	0	yes	southwest	48173.36
24	female	26.6	0	no	northeast	3046.062
31	female	36.63	2	no	southeast	4949.759
41	male	21.78	1	no	southeast	6272.477
37	female	30.8	2	no	southeast	6313.759
38	male	37.05	1	no	northeast	6079.672
55	male	37.3	0	no	southwest	20630.28
18	female	38.665	2	no	northeast	3393.356
28	female	34.77	0	no	northwest	3556.922
60	female	24.53	0	no	southeast	12629.9
36	male	35.2	1	yes	southeast	38709.18
18	female	35.625	0	no	northeast	2211.131
21	female	33.63	2	no	northwest	3579.829
48	male	28	1	yes	southwest	23568.27
36	male	34.43	0	yes	southeast	37742.58
40	female	28.69	3	no	northwest	8059.679
58	male	36.955	2	yes	northwest	47496.49
58	female	31.825	2	no	northeast	13607.37
18	male	31.68	2	yes	southeast	34303.17
53	female	22.88	1	yes	southeast	23244.79
34	female	37.335	2	no	northwest	5989.524
43	male	27.36	3	no	northeast	8606.217
25	male	33.66	4	no	southeast	4504.662
64	male	24.7	1	no	northwest	30166.62
28	female	25.935	1	no	northwest	4133.642
20	female	22.42	0	yes	northwest	14711.74
19	female	28.9	0	no	southwest	1743.214
61	female	39.1	2	no	southwest	14235.07
40	male	26.315	1	no	northwest	6389.378
40	female	36.19	0	no	southeast	5920.104
28	male	23.98	3	yes	southeast	17663.14
27	female	24.75	0	yes	southeast	16577.78
31	male	28.5	5	no	northeast	6799.458
53	female	28.1	3	no	southwest	11741.73
58	male	32.01	1	no	southeast	11946.63
44	male	27.4	2	no	southwest	7726.854
57	male	34.01	0	no	northwest	11356.66

29	female	29.59	1	no	southeast	3947.413
21	male	35.53	0	no	southeast	1532.47
22	female	39.805	0	no	northeast	2755.021
41	female	32.965	0	no	northwest	6571.024
31	male	26.885	1	no	northeast	4441.213
45	female	38.285	0	no	northeast	7935.291
22	male	37.62	1	yes	southeast	37165.16
48	female	41.23	4	no	northwest	11033.66
37	female	34.8	2	yes	southwest	39836.52
45	male	22.895	2	yes	northwest	21098.55
57	female	31.16	0	yes	northwest	43578.94
56	female	27.2	0	no	southwest	11073.18
46	female	27.74	0	no	northwest	8026.667
55	female	26.98	0	no	northwest	11082.58
21	female	39.49	0	no	southeast	2026.974
53	female	24.795	1	no	northwest	10942.13
59	male	29.83	3	yes	northeast	30184.94
35	male	34.77	2	no	northwest	5729.005
64	female	31.3	2	yes	southwest	47291.06
28	female	37.62	1	no	southeast	3766.884
54	female	30.8	3	no	southwest	12105.32
55	male	38.28	0	no	southeast	10226.28
56	male	19.95	0	yes	northeast	22412.65
38	male	19.3	0	yes	southwest	15820.7
41	female	31.6	0	no	southwest	6186.127
30	male	25.46	0	no	northeast	3645.089
18	female	30.115	0	no	northeast	21344.85
61	female	29.92	3	yes	southeast	30942.19
34	female	27.5	1	no	southwest	5003.853
20	male	28.025	1	yes	northwest	17560.38
19	female	28.4	1	no	southwest	2331.519
26	male	30.875	2	no	northwest	3877.304
29	male	27.94	0	no	southeast	2867.12
63	male	35.09	0	yes	southeast	47055.53
54	male	33.63	1	no	northwest	10825.25
55	female	29.7	2	no	southwest	11881.36
37	male	30.8	0	no	southwest	4646.759
21	female	35.72	0	no	northwest	2404.734
52	male	32.205	3	no	northeast	11488.32
60	male	28.595	0	no	northeast	30260
58	male	49.06	0	no	southeast	11381.33
29	female	27.94	1	yes	southeast	19107.78
49	female	27.17	0	no	southeast	8601.329
37	female	23.37	2	no	northwest	6686.431
44	male	37.1	2	no	southwest	7740.337
18	male	23.75	0	no	northeast	1705.625
20	female	28.975	0	no	northwest	2257.475
44	male	31.35	1	yes	northeast	39556.49

47	female	33.915	3	no	northwest	10115.01
26	female	28.785	0	no	northeast	3385.399
19	female	28.3	0	yes	southwest	17081.08
52	female	37.4	0	no	southwest	9634.538
32	female	17.765	2	yes	northwest	32734.19
38	male	34.7	2	no	southwest	6082.405
59	female	26.505	0	no	northeast	12815.44
61	female	22.04	0	no	northeast	13616.36
53	female	35.9	2	no	southwest	11163.57
19	male	25.555	0	no	northwest	1632.564
20	female	28.785	0	no	northeast	2457.211
22	female	28.05	0	no	southeast	2155.682
19	male	34.1	0	no	southwest	1261.442
22	male	25.175	0	no	northwest	2045.685
54	female	31.9	3	no	southeast	27322.73
22	female	36	0	no	southwest	2166.732
34	male	22.42	2	no	northeast	27375.9
26	male	32.49	1	no	northeast	3490.549
34	male	25.3	2	yes	southeast	18972.5
29	male	29.735	2	no	northwest	18157.88
30	male	28.69	3	yes	northwest	20745.99
29	female	38.83	3	no	southeast	5138.257
46	male	30.495	3	yes	northwest	40720.55
51	female	37.73	1	no	southeast	9877.608
53	female	37.43	1	no	northwest	10959.69
19	male	28.4	1	no	southwest	1842.519
35	male	24.13	1	no	northwest	5125.216
48	male	29.7	0	no	southeast	7789.635
32	female	37.145	3	no	northeast	6334.344
42	female	23.37	0	yes	northeast	19964.75
40	female	25.46	1	no	northeast	7077.189
44	male	39.52	0	no	northwest	6948.701
48	male	24.42	0	yes	southeast	21223.68
18	male	25.175	0	yes	northeast	15518.18
30	male	35.53	0	yes	southeast	36950.26
50	female	27.83	3	no	southeast	19749.38
42	female	26.6	0	yes	northwest	21348.71
18	female	36.85	0	yes	southeast	36149.48
54	male	39.6	1	no	southwest	10450.55
32	female	29.8	2	no	southwest	5152.134
37	male	29.64	0	no	northwest	5028.147
47	male	28.215	4	no	northeast	10407.09
20	female	37	5	no	southwest	4830.63
32	female	33.155	3	no	northwest	6128.797
19	female	31.825	1	no	northwest	2719.28
27	male	18.905	3	no	northeast	4827.905
63	male	41.47	0	no	southeast	13405.39
49	male	30.3	0	no	southwest	8116.68

18	male	15.96	0	no	northeast	1694.796
35	female	34.8	1	no	southwest	5246.047
24	female	33.345	0	no	northwest	2855.438
63	female	37.7	0	yes	southwest	48824.45
38	male	27.835	2	no	northwest	6455.863
54	male	29.2	1	no	southwest	10436.1
46	female	28.9	2	no	southwest	8823.279
41	female	33.155	3	no	northeast	8538.288
58	male	28.595	0	no	northwest	11735.88
18	female	38.28	0	no	southeast	1631.821
22	male	19.95	3	no	northeast	4005.423
44	female	26.41	0	no	northwest	7419.478
44	male	30.69	2	no	southeast	7731.427
36	male	41.895	3	yes	northeast	43753.34
26	female	29.92	2	no	southeast	3981.977
30	female	30.9	3	no	southwest	5325.651
41	female	32.2	1	no	southwest	6775.961
29	female	32.11	2	no	northwest	4922.916
61	male	31.57	0	no	southeast	12557.61
36	female	26.2	0	no	southwest	4883.866
25	male	25.74	0	no	southeast	2137.654
56	female	26.6	1	no	northwest	12044.34
18	male	34.43	0	no	southeast	1137.47
19	male	30.59	0	no	northwest	1639.563
39	female	32.8	0	no	southwest	5649.715
45	female	28.6	2	no	southeast	8516.829
51	female	18.05	0	no	northwest	9644.253
64	female	39.33	0	no	northeast	14901.52
19	female	32.11	0	no	northwest	2130.676
48	female	32.23	1	no	southeast	8871.152
60	female	24.035	0	no	northwest	13012.21
27	female	36.08	0	yes	southeast	37133.9
46	male	22.3	0	no	southwest	7147.105
28	female	28.88	1	no	northeast	4337.735
59	male	26.4	0	no	southeast	11743.3
35	male	27.74	2	yes	northeast	20984.09
63	female	31.8	0	no	southwest	13880.95
40	male	41.23	1	no	northeast	6610.11
20	male	33	1	no	southwest	1980.07
40	male	30.875	4	no	northwest	8162.716
24	male	28.5	2	no	northwest	3537.703
34	female	26.73	1	no	southeast	5002.783
45	female	30.9	2	no	southwest	8520.026
41	female	37.1	2	no	southwest	7371.772
53	female	26.6	0	no	northwest	10355.64
27	male	23.1	0	no	southeast	2483.736
26	female	29.92	1	no	southeast	3392.977
24	female	23.21	0	no	southeast	25081.77

34	female	33.7	1	no	southwest	5012.471
53	female	33.25	0	no	northeast	10564.88
32	male	30.8	3	no	southwest	5253.524
19	male	34.8	0	yes	southwest	34779.62
42	male	24.64	0	yes	southeast	19515.54
55	male	33.88	3	no	southeast	11987.17
28	male	38.06	0	no	southeast	2689.495
58	female	41.91	0	no	southeast	24227.34
41	female	31.635	1	no	northeast	7358.176
47	male	25.46	2	no	northeast	9225.256
42	female	36.195	1	no	northwest	7443.643
59	female	27.83	3	no	southeast	14001.29
19	female	17.8	0	no	southwest	1727.785
59	male	27.5	1	no	southwest	12333.83
39	male	24.51	2	no	northwest	6710.192
40	female	22.22	2	yes	southeast	19444.27
18	female	26.73	0	no	southeast	1615.767
31	male	38.39	2	no	southeast	4463.205
19	male	29.07	0	yes	northwest	17352.68
44	male	38.06	1	no	southeast	7152.671
23	female	36.67	2	yes	northeast	38511.63
33	female	22.135	1	no	northeast	5354.075
55	female	26.8	1	no	southwest	35160.13
40	male	35.3	3	no	southwest	7196.867
63	female	27.74	0	yes	northeast	29523.17
54	male	30.02	0	no	northwest	24476.48
60	female	38.06	0	no	southeast	12648.7
24	male	35.86	0	no	southeast	1986.933
19	male	20.9	1	no	southwest	1832.094
29	male	28.975	1	no	northeast	4040.558
18	male	17.29	2	yes	northeast	12829.46
63	female	32.2	2	yes	southwest	47305.31
54	male	34.21	2	yes	southeast	44260.75
27	male	30.3	3	no	southwest	4260.744
50	male	31.825	0	yes	northeast	41097.16
55	female	25.365	3	no	northeast	13047.33
56	male	33.63	0	yes	northwest	43921.18
38	female	40.15	0	no	southeast	5400.981
51	male	24.415	4	no	northwest	11520.1
19	male	31.92	0	yes	northwest	33750.29
58	female	25.2	0	no	southwest	11837.16
20	female	26.84	1	yes	southeast	17085.27
52	male	24.32	3	yes	northeast	24869.84
19	male	36.955	0	yes	northwest	36219.41
53	female	38.06	3	no	southeast	20463
46	male	42.35	3	yes	southeast	46151.12
40	male	19.8	1	yes	southeast	17179.52
59	female	32.395	3	no	northeast	14590.63

45	male	30.2	1	no	southwest	7441.053
49	male	25.84	1	no	northeast	9282.481
18	male	29.37	1	no	southeast	1719.436
50	male	34.2	2	yes	southwest	42856.84
41	male	37.05	2	no	northwest	7265.703
50	male	27.455	1	no	northeast	9617.662
25	male	27.55	0	no	northwest	2523.17
47	female	26.6	2	no	northeast	9715.841
19	male	20.615	2	no	northwest	2803.698
22	female	24.3	0	no	southwest	2150.469
59	male	31.79	2	no	southeast	12928.79
51	female	21.56	1	no	southeast	9855.131
40	female	28.12	1	yes	northeast	22331.57
54	male	40.565	3	yes	northeast	48549.18
30	male	27.645	1	no	northeast	4237.127
55	female	32.395	1	no	northeast	11879.1
52	female	31.2	0	no	southwest	9625.92
46	male	26.62	1	no	southeast	7742.11
46	female	48.07	2	no	northeast	9432.925
63	female	26.22	0	no	northwest	14256.19
59	female	36.765	1	yes	northeast	47896.79
52	male	26.4	3	no	southeast	25992.82
28	female	33.4	0	no	southwest	3172.018
29	male	29.64	1	no	northeast	20277.81
25	male	45.54	2	yes	southeast	42112.24
22	female	28.82	0	no	southeast	2156.752
25	male	26.8	3	no	southwest	3906.127
18	male	22.99	0	no	northeast	1704.568
19	male	27.7	0	yes	southwest	16297.85
47	male	25.41	1	yes	southeast	21978.68
31	male	34.39	3	yes	northwest	38746.36
48	female	28.88	1	no	northwest	9249.495
36	male	27.55	3	no	northeast	6746.743
53	female	22.61	3	yes	northeast	24873.38
56	female	37.51	2	no	southeast	12265.51
28	female	33	2	no	southeast	4349.462
57	female	38	2	no	southwest	12646.21
29	male	33.345	2	no	northwest	19442.35
28	female	27.5	2	no	southwest	20177.67
30	female	33.33	1	no	southeast	4151.029
58	male	34.865	0	no	northeast	11944.59
41	female	33.06	2	no	northwest	7749.156
50	male	26.6	0	no	southwest	8444.474
19	female	24.7	0	no	southwest	1737.376
43	male	35.97	3	yes	southeast	42124.52
49	male	35.86	0	no	southeast	8124.408
27	female	31.4	0	yes	southwest	34838.87
52	male	33.25	0	no	northeast	9722.77

50	male	32.205	0	no	northwest	8835.265
54	male	32.775	0	no	northeast	10435.07
44	female	27.645	0	no	northwest	7421.195
32	male	37.335	1	no	northeast	4667.608
34	male	25.27	1	no	northwest	4894.753
26	female	29.64	4	no	northeast	24671.66
34	male	30.8	0	yes	southwest	35491.64
57	male	40.945	0	no	northeast	11566.3
29	male	27.2	0	no	southwest	2866.091
40	male	34.105	1	no	northeast	6600.206
27	female	23.21	1	no	southeast	3561.889
45	male	36.48	2	yes	northwest	42760.5
64	female	33.8	1	yes	southwest	47928.03
52	male	36.7	0	no	southwest	9144.565
61	female	36.385	1	yes	northeast	48517.56
52	male	27.36	0	yes	northwest	24393.62
61	female	31.16	0	no	northwest	13429.04
56	female	28.785	0	no	northeast	11658.38
43	female	35.72	2	no	northeast	19144.58
64	male	34.5	0	no	southwest	13822.8
60	male	25.74	0	no	southeast	12142.58
62	male	27.55	1	no	northwest	13937.67
50	male	32.3	1	yes	northeast	41919.1
46	female	27.72	1	no	southeast	8232.639
24	female	27.6	0	no	southwest	18955.22
62	male	30.02	0	no	northwest	13352.1
60	female	27.55	0	no	northeast	13217.09
63	male	36.765	0	no	northeast	13981.85
49	female	41.47	4	no	southeast	10977.21
34	female	29.26	3	no	southeast	6184.299
33	male	35.75	2	no	southeast	4890
46	male	33.345	1	no	northeast	8334.458
36	female	29.92	1	no	southeast	5478.037
19	male	27.835	0	no	northwest	1635.734
57	female	23.18	0	no	northwest	11830.61
50	female	25.6	0	no	southwest	8932.084
30	female	27.7	0	no	southwest	3554.203
33	male	35.245	0	no	northeast	12404.88
18	female	38.28	0	no	southeast	14133.04
46	male	27.6	0	no	southwest	24603.05
46	male	43.89	3	no	southeast	8944.115
47	male	29.83	3	no	northwest	9620.331
23	male	41.91	0	no	southeast	1837.282
18	female	20.79	0	no	southeast	1607.51
48	female	32.3	2	no	northeast	10043.25
35	male	30.5	1	no	southwest	4751.07
19	female	21.7	0	yes	southwest	13844.51
21	female	26.4	1	no	southwest	2597.779

21	female	21.89	2	no	southeast	3180.51
49	female	30.78	1	no	northeast	9778.347
56	female	32.3	3	no	northeast	13430.27
42	female	24.985	2	no	northwest	8017.061
44	male	32.015	2	no	northwest	8116.269
18	male	30.4	3	no	northeast	3481.868
61	female	21.09	0	no	northwest	13415.04
57	female	22.23	0	no	northeast	12029.29
42	female	33.155	1	no	northeast	7639.417
26	male	32.9	2	yes	southwest	36085.22
20	male	33.33	0	no	southeast	1391.529
23	female	28.31	0	yes	northwest	18033.97
39	female	24.89	3	yes	northeast	21659.93
24	male	40.15	0	yes	southeast	38126.25
64	female	30.115	3	no	northwest	16455.71
62	male	31.46	1	no	southeast	27000.98
27	female	17.955	2	yes	northeast	15006.58
55	male	30.685	0	yes	northeast	42303.69
55	male	33	0	no	southeast	20781.49
35	female	43.34	2	no	southeast	5846.918
44	male	22.135	2	no	northeast	8302.536
19	male	34.4	0	no	southwest	1261.859
58	female	39.05	0	no	southeast	11856.41
50	male	25.365	2	no	northwest	30284.64
26	female	22.61	0	no	northwest	3176.816
24	female	30.21	3	no	northwest	4618.08
48	male	35.625	4	no	northeast	10736.87
19	female	37.43	0	no	northwest	2138.071
48	male	31.445	1	no	northeast	8964.061
49	male	31.35	1	no	northeast	9290.14
46	female	32.3	2	no	northeast	9411.005
46	male	19.855	0	no	northwest	7526.706
43	female	34.4	3	no	southwest	8522.003
21	male	31.02	0	no	southeast	16586.5
64	male	25.6	2	no	southwest	14988.43
18	female	38.17	0	no	southeast	1631.668
51	female	20.6	0	no	southwest	9264.797
47	male	47.52	1	no	southeast	8083.92
64	female	32.965	0	no	northwest	14692.67
49	male	32.3	3	no	northwest	10269.46
31	male	20.4	0	no	southwest	3260.199
52	female	38.38	2	no	northeast	11396.9
33	female	24.31	0	no	southeast	4185.098
47	female	23.6	1	no	southwest	8539.671
38	male	21.12	3	no	southeast	6652.529
32	male	30.03	1	no	southeast	4074.454
19	male	17.48	0	no	northwest	1621.34
44	female	20.235	1	yes	northeast	19594.81

26	female	17.195	2	yes	northeast	14455.64
25	male	23.9	5	no	southwest	5080.096
19	female	35.15	0	no	northwest	2134.902
43	female	35.64	1	no	southeast	7345.727
52	male	34.1	0	no	southeast	9140.951
36	female	22.6	2	yes	southwest	18608.26
64	male	39.16	1	no	southeast	14418.28
63	female	26.98	0	yes	northwest	28950.47
64	male	33.88	0	yes	southeast	46889.26
61	male	35.86	0	yes	southeast	46599.11
40	male	32.775	1	yes	northeast	39125.33
25	male	30.59	0	no	northeast	2727.395
48	male	30.2	2	no	southwest	8968.33
45	male	24.31	5	no	southeast	9788.866
38	female	27.265	1	no	northeast	6555.07
18	female	29.165	0	no	northeast	7323.735
21	female	16.815	1	no	northeast	3167.456
27	female	30.4	3	no	northwest	18804.75
19	male	33.1	0	no	southwest	23082.96
29	female	20.235	2	no	northwest	4906.41
42	male	26.9	0	no	southwest	5969.723
60	female	30.5	0	no	southwest	12638.2
31	male	28.595	1	no	northwest	4243.59
60	male	33.11	3	no	southeast	13919.82
22	male	31.73	0	no	northeast	2254.797
35	male	28.9	3	no	southwest	5926.846
52	female	46.75	5	no	southeast	12592.53
26	male	29.45	0	no	northeast	2897.324
31	female	32.68	1	no	northwest	4738.268
33	female	33.5	0	yes	southwest	37079.37
18	male	43.01	0	no	southeast	1149.396
59	female	36.52	1	no	southeast	28287.9
56	male	26.695	1	yes	northwest	26109.33
45	female	33.1	0	no	southwest	7345.084
60	male	29.64	0	no	northeast	12731
56	female	25.65	0	no	northwest	11454.02
40	female	29.6	0	no	southwest	5910.944
35	male	38.6	1	no	southwest	4762.329
39	male	29.6	4	no	southwest	7512.267
30	male	24.13	1	no	northwest	4032.241
24	male	23.4	0	no	southwest	1969.614
20	male	29.735	0	no	northwest	1769.532
32	male	46.53	2	no	southeast	4686.389
59	male	37.4	0	no	southwest	21797
55	female	30.14	2	no	southeast	11881.97
57	female	30.495	0	no	northwest	11840.78
56	male	39.6	0	no	southwest	10601.41
40	female	33	3	no	southeast	7682.67

49	female	36.63	3	no	southeast	10381.48
42	male	30	0	yes	southwest	22144.03
62	female	38.095	2	no	northeast	15230.32
56	male	25.935	0	no	northeast	11165.42
19	male	25.175	0	no	northwest	1632.036
30	female	28.38	1	yes	southeast	19521.97
60	female	28.7	1	no	southwest	13224.69
56	female	33.82	2	no	northwest	12643.38
28	female	24.32	1	no	northeast	23288.93
18	female	24.09	1	no	southeast	2201.097
27	male	32.67	0	no	southeast	2497.038
18	female	30.115	0	no	northeast	2203.472
19	female	29.8	0	no	southwest	1744.465
47	female	33.345	0	no	northeast	20878.78
54	male	25.1	3	yes	southwest	25382.3
61	male	28.31	1	yes	northwest	28868.66
24	male	28.5	0	yes	northeast	35147.53
25	male	35.625	0	no	northwest	2534.394
21	male	36.85	0	no	southeast	1534.305
23	male	32.56	0	no	southeast	1824.285
63	male	41.325	3	no	northwest	15555.19
49	male	37.51	2	no	southeast	9304.702
18	female	31.35	0	no	southeast	1622.189
51	female	39.5	1	no	southwest	9880.068
48	male	34.3	3	no	southwest	9563.029
31	female	31.065	0	no	northeast	4347.023
54	female	21.47	3	no	northwest	12475.35
19	male	28.7	0	no	southwest	1253.936
44	female	38.06	0	yes	southeast	48885.14
53	male	31.16	1	no	northwest	10461.98
19	female	32.9	0	no	southwest	1748.774
61	female	25.08	0	no	southeast	24513.09
18	female	25.08	0	no	northeast	2196.473
61	male	43.4	0	no	southwest	12574.05
21	male	25.7	4	yes	southwest	17942.11
20	male	27.93	0	no	northeast	1967.023
31	female	23.6	2	no	southwest	4931.647
45	male	28.7	2	no	southwest	8027.968
44	female	23.98	2	no	southeast	8211.1
62	female	39.2	0	no	southwest	13470.86
29	male	34.4	0	yes	southwest	36197.7
43	male	26.03	0	no	northeast	6837.369
51	male	23.21	1	yes	southeast	22218.11
19	male	30.25	0	yes	southeast	32548.34
38	female	28.93	1	no	southeast	5974.385
37	male	30.875	3	no	northwest	6796.863
22	male	31.35	1	no	northwest	2643.269
21	male	23.75	2	no	northwest	3077.096

24	female	25.27	0	no	northeast	3044.213
57	female	28.7	0	no	southwest	11455.28
56	male	32.11	1	no	northeast	11763
27	male	33.66	0	no	southeast	2498.414
51	male	22.42	0	no	northeast	9361.327
19	male	30.4	0	no	southwest	1256.299
39	male	28.3	1	yes	southwest	21082.16
58	male	35.7	0	no	southwest	11362.76
20	male	35.31	1	no	southeast	27724.29
45	male	30.495	2	no	northwest	8413.463
35	female	31	1	no	southwest	5240.765
31	male	30.875	0	no	northeast	3857.759
50	female	27.36	0	no	northeast	25656.58
32	female	44.22	0	no	southeast	3994.178
51	female	33.915	0	no	northeast	9866.305
38	female	37.73	0	no	southeast	5397.617
42	male	26.07	1	yes	southeast	38245.59
18	female	33.88	0	no	southeast	11482.63
19	female	30.59	2	no	northwest	24059.68
51	female	25.8	1	no	southwest	9861.025
46	male	39.425	1	no	northeast	8342.909
18	male	25.46	0	no	northeast	1708.001
57	male	42.13	1	yes	southeast	48675.52
62	female	31.73	0	no	northeast	14043.48
59	male	29.7	2	no	southeast	12925.89
37	male	36.19	0	no	southeast	19214.71
64	male	40.48	0	no	southeast	13831.12
38	male	28.025	1	no	northeast	6067.127
33	female	38.9	3	no	southwest	5972.378
46	female	30.2	2	no	southwest	8825.086
46	female	28.05	1	no	southeast	8233.098
53	male	31.35	0	no	southeast	27346.04
34	female	38	3	no	southwest	6196.448
20	female	31.79	2	no	southeast	3056.388
63	female	36.3	0	no	southeast	13887.2
54	female	47.41	0	yes	southeast	63770.43
54	male	30.21	0	no	northwest	10231.5
49	male	25.84	2	yes	northwest	23807.24
28	male	35.435	0	no	northeast	3268.847
54	female	46.7	2	no	southwest	11538.42
25	female	28.595	0	no	northeast	3213.622
43	female	46.2	0	yes	southeast	45863.21
63	male	30.8	0	no	southwest	13390.56
32	female	28.93	0	no	southeast	3972.925
62	male	21.4	0	no	southwest	12957.12
52	female	31.73	2	no	northwest	11187.66
25	female	41.325	0	no	northeast	17878.9
28	male	23.8	2	no	southwest	3847.674

46	male	33.44	1	no	northeast	8334.59
34	male	34.21	0	no	southeast	3935.18
35	female	34.105	3	yes	northwest	39983.43
19	male	35.53	0	no	northwest	1646.43
46	female	19.95	2	no	northwest	9193.839
54	female	32.68	0	no	northeast	10923.93
27	male	30.5	0	no	southwest	2494.022
50	male	44.77	1	no	southeast	9058.73
18	female	32.12	2	no	southeast	2801.259
19	female	30.495	0	no	northwest	2128.431
38	female	40.565	1	no	northwest	6373.557
41	male	30.59	2	no	northwest	7256.723
49	female	31.9	5	no	southwest	11552.9
48	male	40.565	2	yes	northwest	45702.02
31	female	29.1	0	no	southwest	3761.292
18	female	37.29	1	no	southeast	2219.445
30	female	43.12	2	no	southeast	4753.637
62	female	36.86	1	no	northeast	31620
57	female	34.295	2	no	northeast	13224.06
58	female	27.17	0	no	northwest	12222.9
22	male	26.84	0	no	southeast	1665
31	female	38.095	1	yes	northeast	58571.07
52	male	30.2	1	no	southwest	9724.53
25	female	23.465	0	no	northeast	3206.491
59	male	25.46	1	no	northeast	12913.99
19	male	30.59	0	no	northwest	1639.563
39	male	45.43	2	no	southeast	6356.271
32	female	23.65	1	no	southeast	17626.24
19	male	20.7	0	no	southwest	1242.816
33	female	28.27	1	no	southeast	4779.602
21	male	20.235	3	no	northeast	3861.21
34	female	30.21	1	yes	northwest	43943.88
61	female	35.91	0	no	northeast	13635.64
38	female	30.69	1	no	southeast	5976.831
58	female	29	0	no	southwest	11842.44
47	male	19.57	1	no	northwest	8428.069
20	male	31.13	2	no	southeast	2566.471
21	female	21.85	1	yes	northeast	15359.1
41	male	40.26	0	no	southeast	5709.164
46	female	33.725	1	no	northeast	8823.986
42	female	29.48	2	no	southeast	7640.309
34	female	33.25	1	no	northeast	5594.846
43	male	32.6	2	no	southwest	7441.501
52	female	37.525	2	no	northwest	33471.97
18	female	39.16	0	no	southeast	1633.044
51	male	31.635	0	no	northwest	9174.136
56	female	25.3	0	no	southwest	11070.54
64	female	39.05	3	no	southeast	16085.13

19	female	28.31	0	yes	northwest	17468.98
51	female	34.1	0	no	southeast	9283.562
27	female	25.175	0	no	northeast	3558.62
59	female	23.655	0	yes	northwest	25678.78
28	male	26.98	2	no	northeast	4435.094
30	male	37.8	2	yes	southwest	39241.44
47	female	29.37	1	no	southeast	8547.691
38	female	34.8	2	no	southwest	6571.544
18	female	33.155	0	no	northeast	2207.697
34	female	19	3	no	northeast	6753.038
20	female	33	0	no	southeast	1880.07
47	female	36.63	1	yes	southeast	42969.85
56	female	28.595	0	no	northeast	11658.12
49	male	25.6	2	yes	southwest	23306.55
19	female	33.11	0	yes	southeast	34439.86
55	female	37.1	0	no	southwest	10713.64
30	male	31.4	1	no	southwest	3659.346
37	male	34.1	4	yes	southwest	40182.25
49	female	21.3	1	no	southwest	9182.17
18	male	33.535	0	yes	northeast	34617.84
59	male	28.785	0	no	northwest	12129.61
29	female	26.03	0	no	northwest	3736.465
36	male	28.88	3	no	northeast	6748.591
33	male	42.46	1	no	southeast	11326.71
58	male	38	0	no	southwest	11365.95
44	female	38.95	0	yes	northwest	42983.46
53	male	36.1	1	no	southwest	10085.85
24	male	29.3	0	no	southwest	1977.815
29	female	35.53	0	no	southeast	3366.67
40	male	22.705	2	no	northeast	7173.36
51	male	39.7	1	no	southwest	9391.346
64	male	38.19	0	no	northeast	14410.93
19	female	24.51	1	no	northwest	2709.112
35	female	38.095	2	no	northeast	24915.05
39	male	26.41	0	yes	northeast	20149.32
56	male	33.66	4	no	southeast	12949.16
33	male	42.4	5	no	southwest	6666.243
42	male	28.31	3	yes	northwest	32787.46
61	male	33.915	0	no	northeast	13143.86
23	female	34.96	3	no	northwest	4466.621
43	male	35.31	2	no	southeast	18806.15
48	male	30.78	3	no	northeast	10141.14
39	male	26.22	1	no	northwest	6123.569
40	female	23.37	3	no	northeast	8252.284
18	male	28.5	0	no	northeast	1712.227
58	female	32.965	0	no	northeast	12430.95
49	female	42.68	2	no	southeast	9800.888
53	female	39.6	1	no	southeast	10579.71

48	female	31.13	0	no	southeast	8280.623
45	female	36.3	2	no	southeast	8527.532
59	female	35.2	0	no	southeast	12244.53
52	female	25.3	2	yes	southeast	24667.42
26	female	42.4	1	no	southwest	3410.324
27	male	33.155	2	no	northwest	4058.712
48	female	35.91	1	no	northeast	26392.26
57	female	28.785	4	no	northeast	14394.4
37	male	46.53	3	no	southeast	6435.624
57	female	23.98	1	no	southeast	22192.44
32	female	31.54	1	no	northeast	5148.553
18	male	33.66	0	no	southeast	1136.399
64	female	22.99	0	yes	southeast	27037.91
43	male	38.06	2	yes	southeast	42560.43
49	male	28.7	1	no	southwest	8703.456
40	female	32.775	2	yes	northwest	40003.33
62	male	32.015	0	yes	northeast	45710.21
40	female	29.81	1	no	southeast	6500.236
30	male	31.57	3	no	southeast	4837.582
29	female	31.16	0	no	northeast	3943.595
36	male	29.7	0	no	southeast	4399.731
41	female	31.02	0	no	southeast	6185.321
44	female	43.89	2	yes	southeast	46200.99
45	male	21.375	0	no	northwest	7222.786
55	female	40.81	3	no	southeast	12485.8
60	male	31.35	3	yes	northwest	46130.53
56	male	36.1	3	no	southwest	12363.55
49	female	23.18	2	no	northwest	10156.78
21	female	17.4	1	no	southwest	2585.269
19	male	20.3	0	no	southwest	1242.26
39	male	35.3	2	yes	southwest	40103.89
53	male	24.32	0	no	northwest	9863.472
33	female	18.5	1	no	southwest	4766.022
53	male	26.41	2	no	northeast	11244.38
42	male	26.125	2	no	northeast	7729.646
40	male	41.69	0	no	southeast	5438.749
47	female	24.1	1	no	southwest	26236.58
27	male	31.13	1	yes	southeast	34806.47
21	male	27.36	0	no	northeast	2104.113
47	male	36.2	1	no	southwest	8068.185
20	male	32.395	1	no	northwest	2362.229
24	male	23.655	0	no	northwest	2352.968
27	female	34.8	1	no	southwest	3577.999
26	female	40.185	0	no	northwest	3201.245
53	female	32.3	2	no	northeast	29186.48
41	male	35.75	1	yes	southeast	40273.65
56	male	33.725	0	no	northwest	10976.25
23	female	39.27	2	no	southeast	3500.612

21	female	34.87	0	no	southeast	2020.552
50	female	44.745	0	no	northeast	9541.696
53	male	41.47	0	no	southeast	9504.31
34	female	26.41	1	no	northwest	5385.338
47	female	29.545	1	no	northwest	8930.935
33	female	32.9	2	no	southwest	5375.038
51	female	38.06	0	yes	southeast	44400.41
49	male	28.69	3	no	northwest	10264.44
31	female	30.495	3	no	northeast	6113.231
36	female	27.74	0	no	northeast	5469.007
18	male	35.2	1	no	southeast	1727.54
50	female	23.54	2	no	southeast	10107.22
43	female	30.685	2	no	northwest	8310.839
20	male	40.47	0	no	northeast	1984.453
24	female	22.6	0	no	southwest	2457.502
60	male	28.9	0	no	southwest	12146.97
49	female	22.61	1	no	northwest	9566.991
60	male	24.32	1	no	northwest	13112.6
51	female	36.67	2	no	northwest	10848.13
58	female	33.44	0	no	northwest	12231.61
51	female	40.66	0	no	northeast	9875.68
53	male	36.6	3	no	southwest	11264.54
62	male	37.4	0	no	southwest	12979.36
19	male	35.4	0	no	southwest	1263.249
50	female	27.075	1	no	northeast	10106.13
30	female	39.05	3	yes	southeast	40932.43
41	male	28.405	1	no	northwest	6664.686
29	female	21.755	1	yes	northeast	16657.72
18	female	40.28	0	no	northeast	2217.601
41	female	36.08	1	no	southeast	6781.354
35	male	24.42	3	yes	southeast	19362
53	male	21.4	1	no	southwest	10065.41
24	female	30.1	3	no	southwest	4234.927
48	female	27.265	1	no	northeast	9447.25
59	female	32.1	3	no	southwest	14007.22
49	female	34.77	1	no	northwest	9583.893
37	female	38.39	0	yes	southeast	40419.02
26	male	23.7	2	no	southwest	3484.331
23	male	31.73	3	yes	northeast	36189.1
29	male	35.5	2	yes	southwest	44585.46
45	male	24.035	2	no	northeast	8604.484
27	male	29.15	0	yes	southeast	18246.5
53	male	34.105	0	yes	northeast	43254.42
31	female	26.62	0	no	southeast	3757.845
50	male	26.41	0	no	northwest	8827.21
50	female	30.115	1	no	northwest	9910.36
34	male	27	2	no	southwest	11737.85
19	male	21.755	0	no	northwest	1627.282

47	female	36	1	no	southwest	8556.907
28	male	30.875	0	no	northwest	3062.508
37	female	26.4	0	yes	southeast	19539.24
21	male	28.975	0	no	northwest	1906.358
64	male	37.905	0	no	northwest	14210.54
58	female	22.77	0	no	southeast	11833.78
24	male	33.63	4	no	northeast	17128.43
31	male	27.645	2	no	northeast	5031.27
39	female	22.8	3	no	northeast	7985.815
47	female	27.83	0	yes	southeast	23065.42
30	male	37.43	3	no	northeast	5428.728
18	male	38.17	0	yes	southeast	36307.8
22	female	34.58	2	no	northeast	3925.758
23	male	35.2	1	no	southwest	2416.955
33	male	27.1	1	yes	southwest	19040.88
27	male	26.03	0	no	northeast	3070.809
45	female	25.175	2	no	northeast	9095.068
57	female	31.825	0	no	northwest	11842.62
47	male	32.3	1	no	southwest	8062.764
42	female	29	1	no	southwest	7050.642
64	female	39.7	0	no	southwest	14319.03
38	female	19.475	2	no	northwest	6933.242
61	male	36.1	3	no	southwest	27941.29
53	female	26.7	2	no	southwest	11150.78
44	female	36.48	0	no	northeast	12797.21
19	female	28.88	0	yes	northwest	17748.51
41	male	34.2	2	no	northwest	7261.741
51	male	33.33	3	no	southeast	10560.49
40	male	32.3	2	no	northwest	6986.697
45	male	39.805	0	no	northeast	7448.404
35	male	34.32	3	no	southeast	5934.38
53	male	28.88	0	no	northwest	9869.81
30	male	24.4	3	yes	southwest	18259.22
18	male	41.14	0	no	southeast	1146.797
51	male	35.97	1	no	southeast	9386.161
50	female	27.6	1	yes	southwest	24520.26
31	female	29.26	1	no	southeast	4350.514
35	female	27.7	3	no	southwest	6414.178
60	male	36.955	0	no	northeast	12741.17
21	male	36.86	0	no	northwest	1917.318
29	male	22.515	3	no	northeast	5209.579
62	female	29.92	0	no	southeast	13457.96
39	female	41.8	0	no	southeast	5662.225
19	male	27.6	0	no	southwest	1252.407
22	female	23.18	0	no	northeast	2731.912
53	male	20.9	0	yes	southeast	21195.82
39	female	31.92	2	no	northwest	7209.492
27	male	28.5	0	yes	northwest	18310.74

30	male	44.22	2	no	southeast	4266.166
30	female	22.895	1	no	northeast	4719.524
58	female	33.1	0	no	southwest	11848.14
33	male	24.795	0	yes	northeast	17904.53
42	female	26.18	1	no	southeast	7046.722
64	female	35.97	0	no	southeast	14313.85
21	male	22.3	1	no	southwest	2103.08
18	female	42.24	0	yes	southeast	38792.69
23	male	26.51	0	no	southeast	1815.876
45	female	35.815	0	no	northwest	7731.858
40	female	41.42	1	no	northwest	28476.73
19	female	36.575	0	no	northwest	2136.882
18	male	30.14	0	no	southeast	1131.507
25	male	25.84	1	no	northeast	3309.793
46	female	30.8	3	no	southwest	9414.92
33	female	42.94	3	no	northwest	6360.994
54	male	21.01	2	no	southeast	11013.71
28	male	22.515	2	no	northeast	4428.888
36	male	34.43	2	no	southeast	5584.306
20	female	31.46	0	no	southeast	1877.929
24	female	24.225	0	no	northwest	2842.761
23	male	37.1	3	no	southwest	3597.596
47	female	26.125	1	yes	northeast	23401.31
33	female	35.53	0	yes	northwest	55135.4
45	male	33.7	1	no	southwest	7445.918
26	male	17.67	0	no	northwest	2680.949
18	female	31.13	0	no	southeast	1621.883
44	female	29.81	2	no	southeast	8219.204
60	male	24.32	0	no	northwest	12523.6
64	female	31.825	2	no	northeast	16069.08
56	male	31.79	2	yes	southeast	43813.87
36	male	28.025	1	yes	northeast	20773.63
41	male	30.78	3	yes	northeast	39597.41
39	male	21.85	1	no	northwest	6117.495
63	male	33.1	0	no	southwest	13393.76
36	female	25.84	0	no	northwest	5266.366
28	female	23.845	2	no	northwest	4719.737
58	male	34.39	0	no	northwest	11743.93
36	male	33.82	1	no	northwest	5377.458
42	male	35.97	2	no	southeast	7160.33
36	male	31.5	0	no	southwest	4402.233
56	female	28.31	0	no	northeast	11657.72
35	female	23.465	2	no	northeast	6402.291
59	female	31.35	0	no	northwest	12622.18
21	male	31.1	0	no	southwest	1526.312
59	male	24.7	0	no	northeast	12323.94
23	female	32.78	2	yes	southeast	36021.01
57	female	29.81	0	yes	southeast	27533.91

53	male	30.495	0	no	northeast	10072.06
60	female	32.45	0	yes	southeast	45008.96
51	female	34.2	1	no	southwest	9872.701
23	male	50.38	1	no	southeast	2438.055
27	female	24.1	0	no	southwest	2974.126
55	male	32.775	0	no	northwest	10601.63
37	female	30.78	0	yes	northeast	37270.15
61	male	32.3	2	no	northwest	14119.62
46	female	35.53	0	yes	northeast	42111.66
53	female	23.75	2	no	northeast	11729.68
49	female	23.845	3	yes	northeast	24106.91
20	female	29.6	0	no	southwest	1875.344
48	female	33.11	0	yes	southeast	40974.16
25	male	24.13	0	yes	northwest	15817.99
25	female	32.23	1	no	southeast	18218.16
57	male	28.1	0	no	southwest	10965.45
37	female	47.6	2	yes	southwest	46113.51
38	female	28	3	no	southwest	7151.092
55	female	33.535	2	no	northwest	12269.69
36	female	19.855	0	no	northeast	5458.046
51	male	25.4	0	no	southwest	8782.469
40	male	29.9	2	no	southwest	6600.361
18	male	37.29	0	no	southeast	1141.445
57	male	43.7	1	no	southwest	11576.13
61	male	23.655	0	no	northeast	13129.6
25	female	24.3	3	no	southwest	4391.652
50	male	36.2	0	no	southwest	8457.818
26	female	29.48	1	no	southeast	3392.365
42	male	24.86	0	no	southeast	5966.887
43	male	30.1	1	no	southwest	6849.026
44	male	21.85	3	no	northeast	8891.14
23	female	28.12	0	no	northwest	2690.114
49	female	27.1	1	no	southwest	26140.36
33	male	33.44	5	no	southeast	6653.789
41	male	28.8	1	no	southwest	6282.235
37	female	29.5	2	no	southwest	6311.952
22	male	34.8	3	no	southwest	3443.064
23	male	27.36	1	no	northwest	2789.057
21	female	22.135	0	no	northeast	2585.851
51	female	37.05	3	yes	northeast	46255.11
25	male	26.695	4	no	northwest	4877.981
32	male	28.93	1	yes	southeast	19719.69
57	male	28.975	0	yes	northeast	27218.44
36	female	30.02	0	no	northwest	5272.176
22	male	39.5	0	no	southwest	1682.597
57	male	33.63	1	no	northwest	11945.13
64	female	26.885	0	yes	northwest	29330.98
36	female	29.04	4	no	southeast	7243.814

54	male	24.035	0	no	northeast	10422.92
47	male	38.94	2	yes	southeast	44202.65
62	male	32.11	0	no	northeast	13555
61	female	44	0	no	southwest	13063.88
43	female	20.045	2	yes	northeast	19798.05
19	male	25.555	1	no	northwest	2221.564
18	female	40.26	0	no	southeast	1634.573
19	female	22.515	0	no	northwest	2117.339
49	male	22.515	0	no	northeast	8688.859
60	male	40.92	0	yes	southeast	48673.56
26	male	27.265	3	no	northeast	4661.286
49	male	36.85	0	no	southeast	8125.785
60	female	35.1	0	no	southwest	12644.59
26	female	29.355	2	no	northeast	4564.191
27	male	32.585	3	no	northeast	4846.92
44	female	32.34	1	no	southeast	7633.721
63	male	39.8	3	no	southwest	15170.07
32	female	24.6	0	yes	southwest	17496.31
22	male	28.31	1	no	northwest	2639.043
18	male	31.73	0	yes	northeast	33732.69
59	female	26.695	3	no	northwest	14382.71
44	female	27.5	1	no	southwest	7626.993
33	male	24.605	2	no	northwest	5257.508
24	female	33.99	0	no	southeast	2473.334
43	female	26.885	0	yes	northwest	21774.32
45	male	22.895	0	yes	northeast	35069.37
61	female	28.2	0	no	southwest	13041.92
35	female	34.21	1	no	southeast	5245.227
62	female	25	0	no	southwest	13451.12
62	female	33.2	0	no	southwest	13462.52
38	male	31	1	no	southwest	5488.262
34	male	35.815	0	no	northwest	4320.411
43	male	23.2	0	no	southwest	6250.435
50	male	32.11	2	no	northeast	25333.33
19	female	23.4	2	no	southwest	2913.569
57	female	20.1	1	no	southwest	12032.33
62	female	39.16	0	no	southeast	13470.8
41	male	34.21	1	no	southeast	6289.755
26	male	46.53	1	no	southeast	2927.065
39	female	32.5	1	no	southwest	6238.298
46	male	25.8	5	no	southwest	10096.97
45	female	35.3	0	no	southwest	7348.142
32	male	37.18	2	no	southeast	4673.392
59	female	27.5	0	no	southwest	12233.83
44	male	29.735	2	no	northeast	32108.66
39	female	24.225	5	no	northwest	8965.796
18	male	26.18	2	no	southeast	2304.002
53	male	29.48	0	no	southeast	9487.644

18	male	23.21	0	no	southeast	1121.874
50	female	46.09	1	no	southeast	9549.565
18	female	40.185	0	no	northeast	2217.469
19	male	22.61	0	no	northwest	1628.471
62	male	39.93	0	no	southeast	12982.87
56	female	35.8	1	no	southwest	11674.13
42	male	35.8	2	no	southwest	7160.094
37	male	34.2	1	yes	northeast	39047.29
42	male	31.255	0	no	northwest	6358.776
25	male	29.7	3	yes	southwest	19933.46
57	male	18.335	0	no	northeast	11534.87
51	male	42.9	2	yes	southeast	47462.89
30	female	28.405	1	no	northwest	4527.183
44	male	30.2	2	yes	southwest	38998.55
34	male	27.835	1	yes	northwest	20009.63
31	male	39.49	1	no	southeast	3875.734
54	male	30.8	1	yes	southeast	41999.52
24	male	26.79	1	no	northwest	12609.89
43	male	34.96	1	yes	northeast	41034.22
48	male	36.67	1	no	northwest	28468.92
19	female	39.615	1	no	northwest	2730.108
29	female	25.9	0	no	southwest	3353.284
63	female	35.2	1	no	southeast	14474.68
46	male	24.795	3	no	northeast	9500.573
52	male	36.765	2	no	northwest	26467.1
35	male	27.1	1	no	southwest	4746.344
51	male	24.795	2	yes	northwest	23967.38
44	male	25.365	1	no	northwest	7518.025
21	male	25.745	2	no	northeast	3279.869
39	female	34.32	5	no	southeast	8596.828
50	female	28.16	3	no	southeast	10702.64
34	female	23.56	0	no	northeast	4992.376
22	female	20.235	0	no	northwest	2527.819
19	female	40.5	0	no	southwest	1759.338
26	male	35.42	0	no	southeast	2322.622
29	male	22.895	0	yes	northeast	16138.76
48	male	40.15	0	no	southeast	7804.161
26	male	29.15	1	no	southeast	2902.907
45	female	39.995	3	no	northeast	9704.668
36	female	29.92	0	no	southeast	4889.037
54	male	25.46	1	no	northeast	25517.11
34	male	21.375	0	no	northeast	4500.339
31	male	25.9	3	yes	southwest	19199.94
27	female	30.59	1	no	northeast	16796.41
20	male	30.115	5	no	northeast	4915.06
44	female	25.8	1	no	southwest	7624.63
43	male	30.115	3	no	northwest	8410.047
45	female	27.645	1	no	northwest	28340.19

34	male	34.675	0	no	northeast	4518.826
24	female	20.52	0	yes	northeast	14571.89
26	female	19.8	1	no	southwest	3378.91
38	female	27.835	2	no	northeast	7144.863
50	female	31.6	2	no	southwest	10118.42
38	male	28.27	1	no	southeast	5484.467
27	female	20.045	3	yes	northwest	16420.49
39	female	23.275	3	no	northeast	7986.475
39	female	34.1	3	no	southwest	7418.522
63	female	36.85	0	no	southeast	13887.97
33	female	36.29	3	no	northeast	6551.75
36	female	26.885	0	no	northwest	5267.818
30	male	22.99	2	yes	northwest	17361.77
24	male	32.7	0	yes	southwest	34472.84
24	male	25.8	0	no	southwest	1972.95
48	male	29.6	0	no	southwest	21232.18
47	male	19.19	1	no	northeast	8627.541
29	male	31.73	2	no	northwest	4433.388
28	male	29.26	2	no	northeast	4438.263
47	male	28.215	3	yes	northwest	24915.22
25	male	24.985	2	no	northeast	23241.47
51	male	27.74	1	no	northeast	9957.722
48	female	22.8	0	no	southwest	8269.044
43	male	20.13	2	yes	southeast	18767.74
61	female	33.33	4	no	southeast	36580.28
48	male	32.3	1	no	northwest	8765.249
38	female	27.6	0	no	southwest	5383.536
59	male	25.46	0	no	northwest	12124.99
19	female	24.605	1	no	northwest	2709.244
26	female	34.2	2	no	southwest	3987.926
54	female	35.815	3	no	northwest	12495.29
21	female	32.68	2	no	northwest	26018.95
51	male	37	0	no	southwest	8798.593
22	female	31.02	3	yes	southeast	35595.59
47	male	36.08	1	yes	southeast	42211.14
18	male	23.32	1	no	southeast	1711.027
47	female	45.32	1	no	southeast	8569.862
21	female	34.6	0	no	southwest	2020.177
19	male	26.03	1	yes	northwest	16450.89
23	male	18.715	0	no	northwest	21595.38
54	male	31.6	0	no	southwest	9850.432
37	female	17.29	2	no	northeast	6877.98
46	female	23.655	1	yes	northwest	21677.28
55	female	35.2	0	yes	southeast	44423.8
30	female	27.93	0	no	northeast	4137.523
18	male	21.565	0	yes	northeast	13747.87
61	male	38.38	0	no	northwest	12950.07
54	female	23	3	no	southwest	12094.48

22	male	37.07	2	yes	southeast	37484.45
45	female	30.495	1	yes	northwest	39725.52
22	male	28.88	0	no	northeast	2250.835
19	male	27.265	2	no	northwest	22493.66
35	female	28.025	0	yes	northwest	20234.85
18	male	23.085	0	no	northeast	1704.7
20	male	30.685	0	yes	northeast	33475.82
28	female	25.8	0	no	southwest	3161.454
55	male	35.245	1	no	northeast	11394.07
43	female	24.7	2	yes	northwest	21880.82
43	female	25.08	0	no	northeast	7325.048
22	male	52.58	1	yes	southeast	44501.4
25	female	22.515	1	no	northwest	3594.171
49	male	30.9	0	yes	southwest	39727.61
44	female	36.955	1	no	northwest	8023.135
64	male	26.41	0	no	northeast	14394.56
49	male	29.83	1	no	northeast	9288.027
47	male	29.8	3	yes	southwest	25309.49
27	female	21.47	0	no	northwest	3353.47
55	male	27.645	0	no	northwest	10594.5
48	female	28.9	0	no	southwest	8277.523
45	female	31.79	0	no	southeast	17929.3
24	female	39.49	0	no	southeast	2480.979
32	male	33.82	1	no	northwest	4462.722
24	male	32.01	0	no	southeast	1981.582
57	male	27.94	1	no	southeast	11554.22
59	male	41.14	1	yes	southeast	48970.25
36	male	28.595	3	no	northwest	6548.195
29	female	25.6	4	no	southwest	5708.867
42	female	25.3	1	no	southwest	7045.499
48	male	37.29	2	no	southeast	8978.185
39	male	42.655	0	no	northeast	5757.413
63	male	21.66	1	no	northwest	14349.85
54	female	31.9	1	no	southeast	10928.85
37	male	37.07	1	yes	southeast	39871.7
63	male	31.445	0	no	northeast	13974.46
21	male	31.255	0	no	northwest	1909.527
54	female	28.88	2	no	northeast	12096.65
60	female	18.335	0	no	northeast	13204.29
32	female	29.59	1	no	southeast	4562.842
47	female	32	1	no	southwest	8551.347
21	male	26.03	0	no	northeast	2102.265
28	male	31.68	0	yes	southeast	34672.15
63	male	33.66	3	no	southeast	15161.53
18	male	21.78	2	no	southeast	11884.05
32	male	27.835	1	no	northwest	4454.403
38	male	19.95	1	no	northwest	5855.903
32	male	31.5	1	no	southwest	4076.497

62	female	30.495	2	no	northwest	15019.76
39	female	18.3	5	yes	southwest	19023.26
55	male	28.975	0	no	northeast	10796.35
57	male	31.54	0	no	northwest	11353.23
52	male	47.74	1	no	southeast	9748.911
56	male	22.1	0	no	southwest	10577.09
47	male	36.19	0	yes	southeast	41676.08
55	female	29.83	0	no	northeast	11286.54
23	male	32.7	3	no	southwest	3591.48
22	female	30.4	0	yes	northwest	33907.55
50	female	33.7	4	no	southwest	11299.34
18	female	31.35	4	no	northeast	4561.189
51	female	34.96	2	yes	northeast	44641.2
22	male	33.77	0	no	southeast	1674.632
52	female	30.875	0	no	northeast	23045.57
25	female	33.99	1	no	southeast	3227.121
33	female	19.095	2	yes	northeast	16776.3
53	male	28.6	3	no	southwest	11253.42
29	male	38.94	1	no	southeast	3471.41
58	male	36.08	0	no	southeast	11363.28
37	male	29.8	0	no	southwest	20420.6
54	female	31.24	0	no	southeast	10338.93
49	female	29.925	0	no	northwest	8988.159
50	female	26.22	2	no	northwest	10493.95
26	male	30	1	no	southwest	2904.088
45	male	20.35	3	no	southeast	8605.362
54	female	32.3	1	no	northeast	11512.41
38	male	38.39	3	yes	southeast	41949.24
48	female	25.85	3	yes	southeast	24180.93
28	female	26.315	3	no	northwest	5312.17
23	male	24.51	0	no	northeast	2396.096
55	male	32.67	1	no	southeast	10807.49
41	male	29.64	5	no	northeast	9222.403
25	male	33.33	2	yes	southeast	36124.57
33	male	35.75	1	yes	southeast	38282.75
30	female	19.95	3	no	northwest	5693.431
23	female	31.4	0	yes	southwest	34166.27
46	male	38.17	2	no	southeast	8347.164
53	female	36.86	3	yes	northwest	46661.44
27	female	32.395	1	no	northeast	18903.49
23	female	42.75	1	yes	northeast	40904.2
63	female	25.08	0	no	northwest	14254.61
55	male	29.9	0	no	southwest	10214.64
35	female	35.86	2	no	southeast	5836.52
34	male	32.8	1	no	southwest	14358.36
19	female	18.6	0	no	southwest	1728.897
39	female	23.87	5	no	southeast	8582.302
27	male	45.9	2	no	southwest	3693.428

57	male	40.28	0	no	northeast	20709.02
52	female	18.335	0	no	northwest	9991.038
28	male	33.82	0	no	northwest	19673.34
50	female	28.12	3	no	northwest	11085.59
44	female	25	1	no	southwest	7623.518
26	female	22.23	0	no	northwest	3176.288
33	male	30.25	0	no	southeast	3704.355
19	female	32.49	0	yes	northwest	36898.73
50	male	37.07	1	no	southeast	9048.027
41	female	32.6	3	no	southwest	7954.517
52	female	24.86	0	no	southeast	27117.99
39	male	32.34	2	no	southeast	6338.076
50	male	32.3	2	no	southwest	9630.397
52	male	32.775	3	no	northwest	11289.11
60	male	32.8	0	yes	southwest	52590.83
20	female	31.92	0	no	northwest	2261.569
55	male	21.5	1	no	southwest	10791.96
42	male	34.1	0	no	southwest	5979.731
18	female	30.305	0	no	northeast	2203.736
58	female	36.48	0	no	northwest	12235.84
43	female	32.56	3	yes	southeast	40941.29
35	female	35.815	1	no	northwest	5630.458
48	female	27.93	4	no	northwest	11015.17
36	female	22.135	3	no	northeast	7228.216
19	male	44.88	0	yes	southeast	39722.75
23	female	23.18	2	no	northwest	14426.07
20	female	30.59	0	no	northeast	2459.72
32	female	41.1	0	no	southwest	3989.841
43	female	34.58	1	no	northwest	7727.253
34	male	42.13	2	no	southeast	5124.189
30	male	38.83	1	no	southeast	18963.17
18	female	28.215	0	no	northeast	2200.831
41	female	28.31	1	no	northwest	7153.554
35	female	26.125	0	no	northeast	5227.989
57	male	40.37	0	no	southeast	10982.5
29	female	24.6	2	no	southwest	4529.477
32	male	35.2	2	no	southwest	4670.64
37	female	34.105	1	no	northwest	6112.353
18	male	27.36	1	yes	northeast	17178.68
43	female	26.7	2	yes	southwest	22478.6
56	female	41.91	0	no	southeast	11093.62
38	male	29.26	2	no	northwest	6457.843
29	male	32.11	2	no	northwest	4433.916
22	female	27.1	0	no	southwest	2154.361
52	female	24.13	1	yes	northwest	23887.66
40	female	27.4	1	no	southwest	6496.886
23	female	34.865	0	no	northeast	2899.489
31	male	29.81	0	yes	southeast	19350.37

42	female	41.325	1	no	northeast	7650.774
24	female	29.925	0	no	northwest	2850.684
25	female	30.3	0	no	southwest	2632.992
48	female	27.36	1	no	northeast	9447.382
23	female	28.49	1	yes	southeast	18328.24
45	male	23.56	2	no	northeast	8603.823
20	male	35.625	3	yes	northwest	37465.34
62	female	32.68	0	no	northwest	13844.8
43	female	25.27	1	yes	northeast	21771.34
23	female	28	0	no	southwest	13126.68
31	female	32.775	2	no	northwest	5327.4
41	female	21.755	1	no	northeast	13725.47
58	female	32.395	1	no	northeast	13019.16
48	female	36.575	0	no	northwest	8671.191
31	female	21.755	0	no	northwest	4134.082
19	female	27.93	3	no	northwest	18838.7
19	female	30.02	0	yes	northwest	33307.55
41	male	33.55	0	no	southeast	5699.838
40	male	29.355	1	no	northwest	6393.603
31	female	25.8	2	no	southwest	4934.705
37	male	24.32	2	no	northwest	6198.752
46	male	40.375	2	no	northwest	8733.229
22	male	32.11	0	no	northwest	2055.325
51	male	32.3	1	no	northeast	9964.06
18	female	27.28	3	yes	southeast	18223.45
35	male	17.86	1	no	northwest	5116.5
59	female	34.8	2	no	southwest	36910.61
36	male	33.4	2	yes	southwest	38415.47
37	female	25.555	1	yes	northeast	20296.86
59	male	37.1	1	no	southwest	12347.17
36	male	30.875	1	no	northwest	5373.364
39	male	34.1	2	no	southeast	23563.02
18	male	21.47	0	no	northeast	1702.455
52	female	33.3	2	no	southwest	10806.84
27	female	31.255	1	no	northwest	3956.071
18	male	39.14	0	no	northeast	12890.06
40	male	25.08	0	no	southeast	5415.661
29	male	37.29	2	no	southeast	4058.116
46	female	34.6	1	yes	southwest	41661.6
38	female	30.21	3	no	northwest	7537.164
30	female	21.945	1	no	northeast	4718.204
40	male	24.97	2	no	southeast	6593.508
50	male	25.3	0	no	southeast	8442.667
20	female	24.42	0	yes	southeast	26125.67
41	male	23.94	1	no	northeast	6858.48
33	female	39.82	1	no	southeast	4795.657
38	male	16.815	2	no	northeast	6640.545
42	male	37.18	2	no	southeast	7162.012

56	male	34.43	0	no	southeast	10594.23
58	male	30.305	0	no	northeast	11938.26
52	male	34.485	3	yes	northwest	60021.4
20	female	21.8	0	yes	southwest	20167.34
54	female	24.605	3	no	northwest	12479.71
58	male	23.3	0	no	southwest	11345.52
45	female	27.83	2	no	southeast	8515.759
26	male	31.065	0	no	northwest	2699.568
63	female	21.66	0	no	northeast	14449.85
58	female	28.215	0	no	northwest	12224.35
37	male	22.705	3	no	northeast	6985.507
25	female	42.13	1	no	southeast	3238.436
52	male	41.8	2	yes	southeast	47269.85
64	male	36.96	2	yes	southeast	49577.66
22	female	21.28	3	no	northwest	4296.271
28	female	33.11	0	no	southeast	3171.615
18	male	33.33	0	no	southeast	1135.941
28	male	24.3	5	no	southwest	5615.369
45	female	25.7	3	no	southwest	9101.798
33	male	29.4	4	no	southwest	6059.173
18	female	39.82	0	no	southeast	1633.962
32	male	33.63	1	yes	northeast	37607.53
24	male	29.83	0	yes	northeast	18648.42
19	male	19.8	0	no	southwest	1241.565
20	male	27.3	0	yes	southwest	16232.85
40	female	29.3	4	no	southwest	15828.82
34	female	27.72	0	no	southeast	4415.159
42	female	37.9	0	no	southwest	6474.013
51	female	36.385	3	no	northwest	11436.74
54	female	27.645	1	no	northwest	11305.93
55	male	37.715	3	no	northwest	30063.58
52	female	23.18	0	no	northeast	10197.77
32	female	20.52	0	no	northeast	4544.235
28	male	37.1	1	no	southwest	3277.161
41	female	28.05	1	no	southeast	6770.193
43	female	29.9	1	no	southwest	7337.748
49	female	33.345	2	no	northeast	10370.91
64	male	23.76	0	yes	southeast	26926.51
55	female	30.5	0	no	southwest	10704.47
24	male	31.065	0	yes	northeast	34254.05
20	female	33.3	0	no	southwest	1880.487
45	male	27.5	3	no	southwest	8615.3
26	male	33.915	1	no	northwest	3292.53
25	female	34.485	0	no	northwest	3021.809
43	male	25.52	5	no	southeast	14478.33
35	male	27.61	1	no	southeast	4747.053
26	male	27.06	0	yes	southeast	17043.34
57	male	23.7	0	no	southwest	10959.33

22	female	30.4	0	no	northeast	2741.948
32	female	29.735	0	no	northwest	4357.044
39	male	29.925	1	yes	northeast	22462.04
25	female	26.79	2	no	northwest	4189.113
48	female	33.33	0	no	southeast	8283.681
47	female	27.645	2	yes	northwest	24535.7
18	female	21.66	0	yes	northeast	14283.46
18	male	30.03	1	no	southeast	1720.354
61	male	36.3	1	yes	southwest	47403.88
47	female	24.32	0	no	northeast	8534.672
28	female	17.29	0	no	northeast	3732.625
36	female	25.9	1	no	southwest	5472.449
20	male	39.4	2	yes	southwest	38344.57
44	male	34.32	1	no	southeast	7147.473
38	female	19.95	2	no	northeast	7133.903
19	male	34.9	0	yes	southwest	34828.65
21	male	23.21	0	no	southeast	1515.345
46	male	25.745	3	no	northwest	9301.894
58	male	25.175	0	no	northeast	11931.13
20	male	22	1	no	southwest	1964.78
18	male	26.125	0	no	northeast	1708.926
28	female	26.51	2	no	southeast	4340.441
33	male	27.455	2	no	northwest	5261.469
19	female	25.745	1	no	northwest	2710.829
45	male	30.36	0	yes	southeast	62592.87
62	male	30.875	3	yes	northwest	46718.16
25	female	20.8	1	no	southwest	3208.787
43	male	27.8	0	yes	southwest	37829.72
42	male	24.605	2	yes	northeast	21259.38
24	female	27.72	0	no	southeast	2464.619
29	female	21.85	0	yes	northeast	16115.3
32	male	28.12	4	yes	northwest	21472.48
25	female	30.2	0	yes	southwest	33900.65
41	male	32.2	2	no	southwest	6875.961
42	male	26.315	1	no	northwest	6940.91
33	female	26.695	0	no	northwest	4571.413
34	male	42.9	1	no	southwest	4536.259
19	female	34.7	2	yes	southwest	36397.58
30	female	23.655	3	yes	northwest	18765.88
18	male	28.31	1	no	northeast	11272.33
19	female	20.6	0	no	southwest	1731.677
18	male	53.13	0	no	southeast	1163.463
35	male	39.71	4	no	northeast	19496.72
39	female	26.315	2	no	northwest	7201.701
31	male	31.065	3	no	northwest	5425.023
62	male	26.695	0	yes	northeast	28101.33
62	male	38.83	0	no	southeast	12981.35
42	female	40.37	2	yes	southeast	43896.38

31	male	25.935	1	no	northwest	4239.893
61	male	33.535	0	no	northeast	13143.34
42	female	32.87	0	no	northeast	7050.021
51	male	30.03	1	no	southeast	9377.905
23	female	24.225	2	no	northeast	22395.74
52	male	38.6	2	no	southwest	10325.21
57	female	25.74	2	no	southeast	12629.17
23	female	33.4	0	no	southwest	10795.94
52	female	44.7	3	no	southwest	11411.69
50	male	30.97	3	no	northwest	10600.55
18	female	31.92	0	no	northeast	2205.981
18	female	36.85	0	no	southeast	1629.834
21	female	25.8	0	no	southwest	2007.945

Implementation:

localhost:8888/notebooks/Untitled27.ipynb?kernel_name=python3

jupyter Untitled27 Last Checkpoint: a minute ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

```
In [2]: import numpy as np
import pandas as pd
import os
import matplotlib.pyplot as plt
import seaborn as sns
import warnings
warnings.filterwarnings('ignore')
data = pd.read_csv('insurance.csv')
```

```
In [3]: data.head()
```

Out[3]:

	age	sex	bmi	children	smoker	region	charges
0	19	female	27.900	0	yes	southwest	16884.92400
1	18	male	33.770	1	no	southeast	1725.55230
2	28	male	33.000	3	no	southeast	4449.46200
3	33	male	22.705	0	no	northwest	21984.47061
4	32	male	28.880	0	no	northwest	3866.85520

localhost:8888/notebooks/Untitled27.ipynb?kernel_name=python3

jupyter Untitled27 Last Checkpoint: a minute ago (autosaved) Logout

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3

```
In [4]: data.isnull().sum()
```

Out[4]:

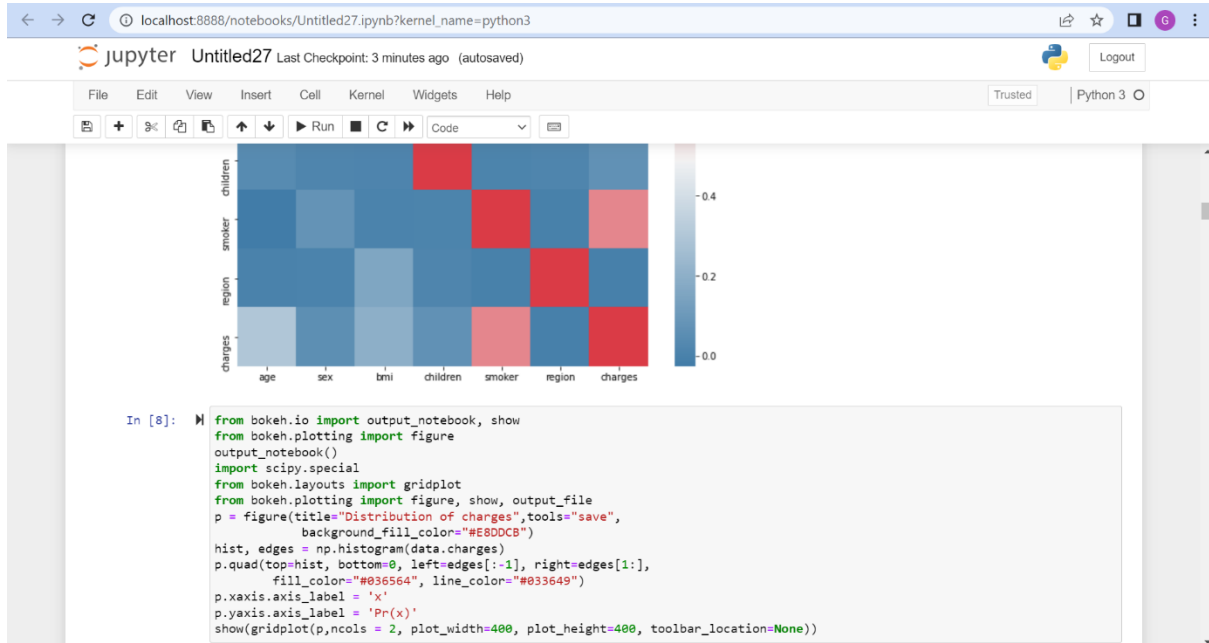
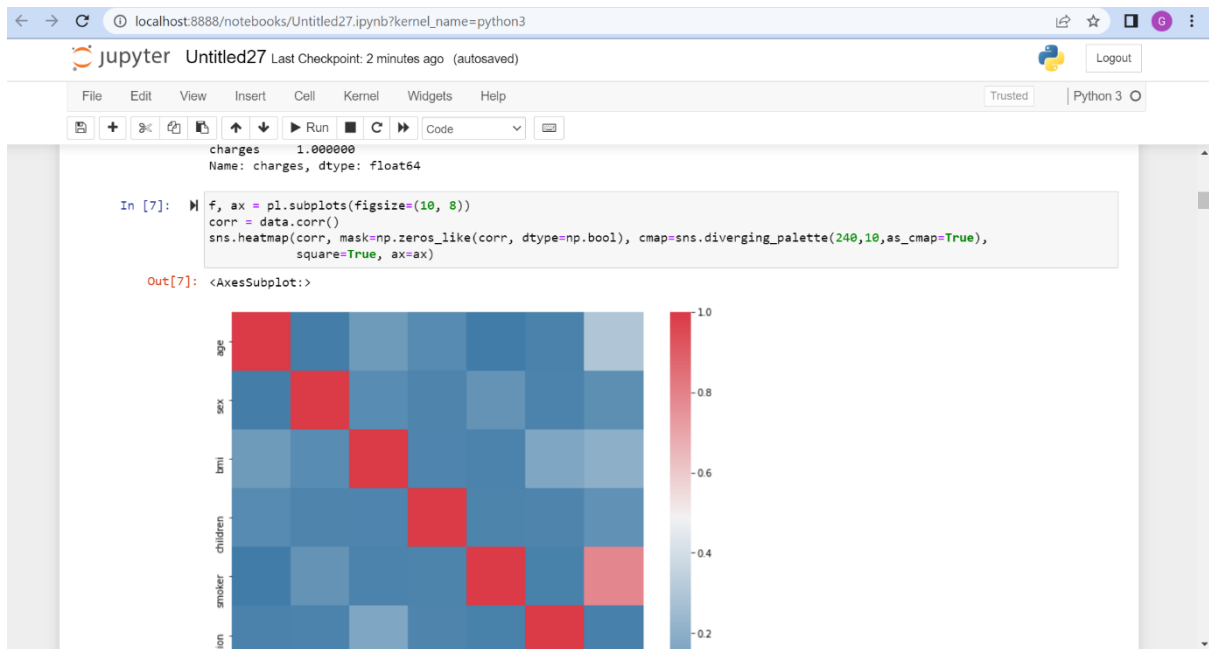
age	0
sex	0
bmi	0
children	0
smoker	0
region	0
charges	0
dtype:	int64

```
In [5]: from sklearn.preprocessing import LabelEncoder
#sex
le = LabelEncoder()
le.fit(data.sex.drop_duplicates())
data.sex = le.transform(data.sex)
# smoker or not
le.fit(data.smoker.drop_duplicates())
data.smoker = le.transform(data.smoker)
#region
le.fit(data.region.drop_duplicates())
data.region = le.transform(data.region)
```

```
In [6]: data.corr()['charges'].sort_values()
```

Out[6]:

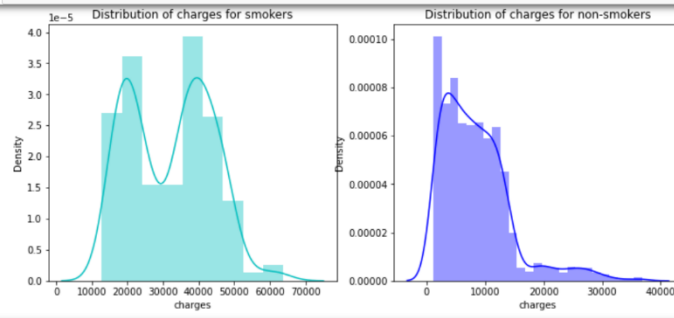
region	-0.006208
sex	0.057292
children	0.067998
bmi	0.198341
age	0.299008
smoker	0.787251



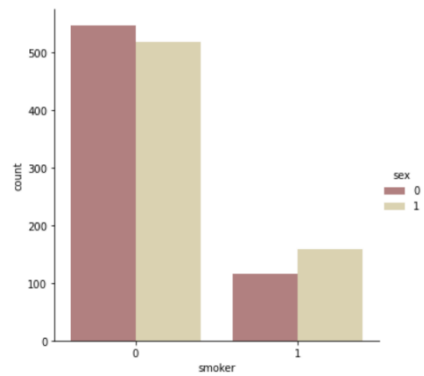
```
In [9]: f = plt.figure(figsize=(12,5))

ax=f.add_subplot(121)
sns.distplot(data[(data.smoker == 1)]["charges"],color='c',ax=ax)
ax.set_title('Distribution of charges for smokers')

ax=f.add_subplot(122)
sns.distplot(data[(data.smoker == 0)]["charges"],color='b',ax=ax)
ax.set_title('Distribution of charges for non-smokers')
```

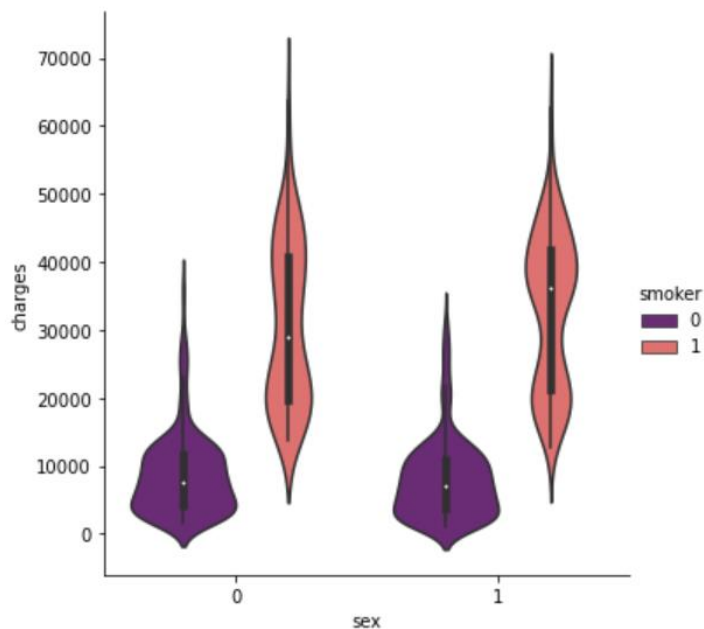



```
In [12]: sns.catplot(x="smoker", kind="count", hue = 'sex', palette="pink", data=data)
Out[12]: <seaborn.axisgrid.FacetGrid at 0x29c22046340>
```

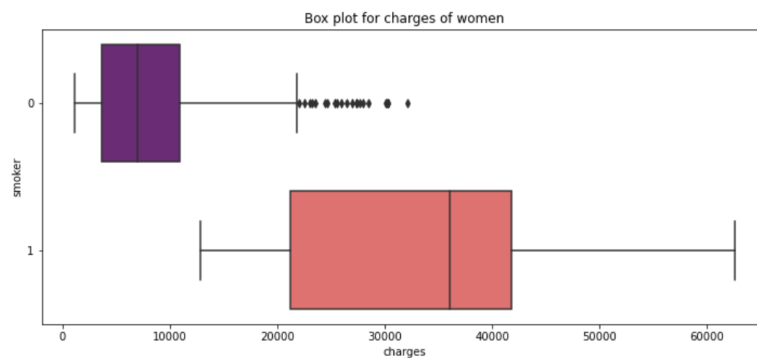


```
In [13]: sns.catplot(x="sex", y="charges", hue="smoker",
kind="violin", data=data, palette = 'magma')
Out[13]: <seaborn.axisgrid.FacetGrid at 0x29c1ba90fa0>
```

Out[13]: <seaborn.axisgrid.FacetGrid at 0x29c1ba90fa0>

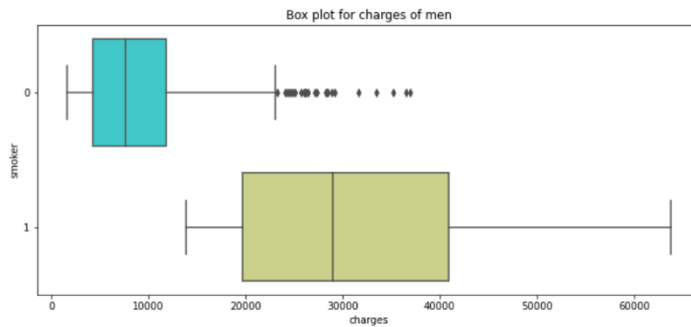


```
In [14]: plt.figure(figsize=(12,5))
plt.title("Box plot for charges of women")
sns.boxplot(y="smoker", x="charges", data = data[(data.sex == 1)] , orient="h", palette = 'magma')
Out[14]: <AxesSubplot:title={'center':'Box plot for charges of women'}, xlabel='charges', ylabel='smoker'>
```



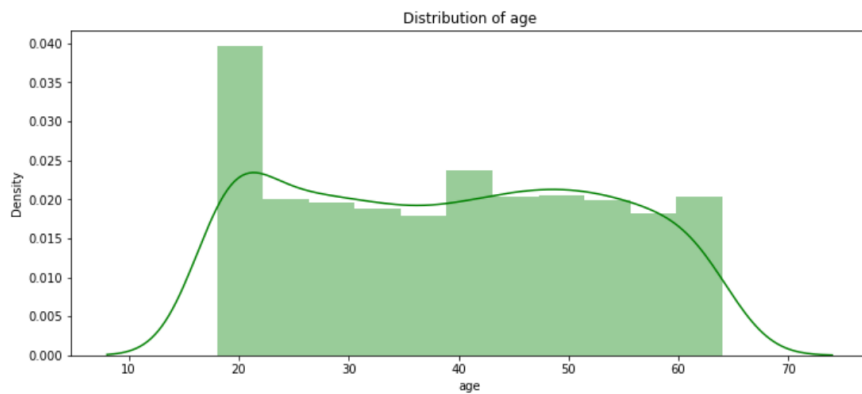
```
In [15]: pl.figure(figsize=(12,5))
pl.title("Box plot for charges of men")
sns.boxplot(y="smoker", x="charges", data = data[(data.sex == 0)] , orient="h", palette = 'rainbow')

Out[15]: <AxesSubplot:title={'center':'Box plot for charges of men'}, xlabel='charges', ylabel='smoker'>
```



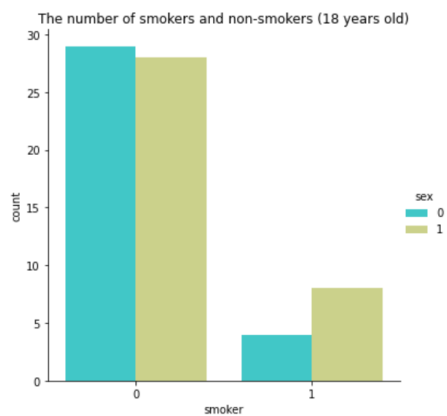
```
In [16]: pl.figure(figsize=(12,5))
pl.title("Distribution of age")
ax = sns.distplot(data["age"], color = 'g')
```

```
In [16]: pl.figure(figsize=(12,5))
pl.title("Distribution of age")
ax = sns.distplot(data["age"], color = 'g')
```



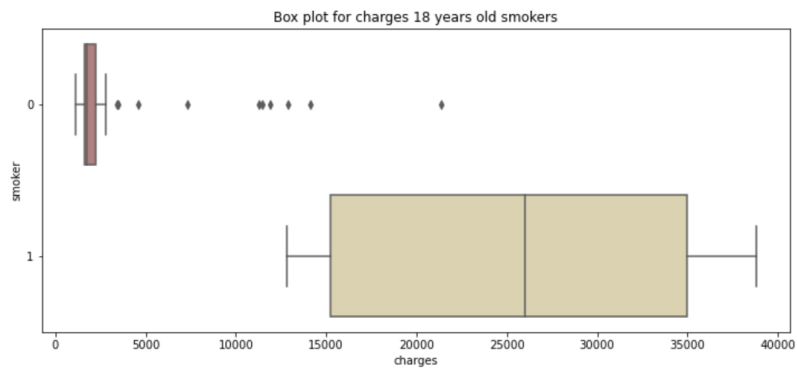
```
In [17]: sns.catplot(x="smoker", kind="count",hue = 'sex', palette="rainbow", data=data[(data.age == 18)])
pl.title("The number of smokers and non-smokers (18 years old)")
```

```
Out[17]: Text(0.5, 1.0, 'The number of smokers and non-smokers (18 years old)')
```



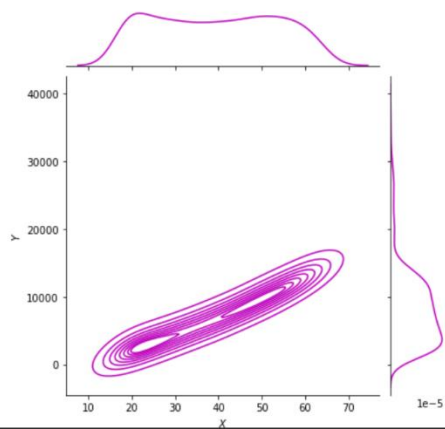
```
In [18]: plt.figure(figsize=(12,5))
plt.title("Box plot for charges 18 years old smokers")
sns.boxplot(y="smoker", x="charges", data = data[(data.age == 18)] , orient="h", palette = 'pink')
```

Out[18]: <AxesSubplot:title={'center':'Box plot for charges 18 years old smokers'}, xlabel='charges', ylabel='smoker'>



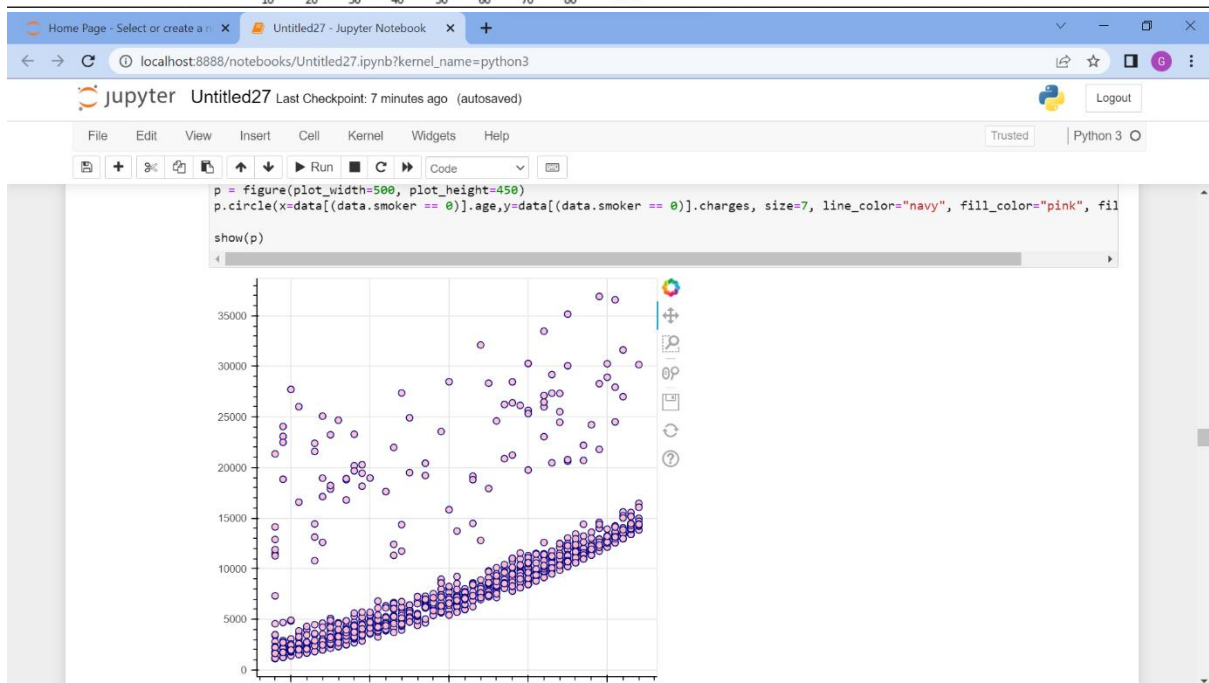
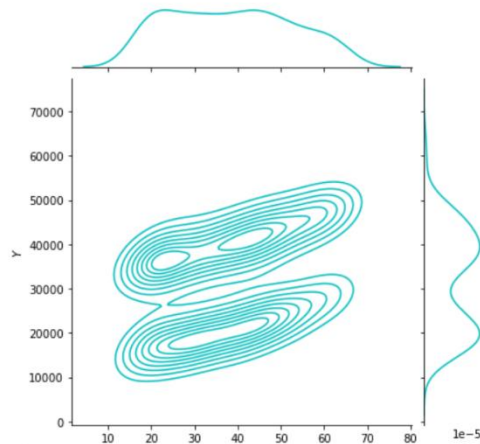
```
In [19]: g = sns.jointplot(x="age", y="charges", data = data[(data.smoker == 0)], kind="kde", color="m")
g.plot_joint(plt.scatter, c="w", s=30, linewidth=1, marker="+")
g.ax_joint.collections[0].set_alpha(0)
g.set_axis_labels("$X$", "$Y$")
ax.set_title('Distribution of charges and age for non-smokers')
```

Out[19]: Text(0.5, 1.0, 'Distribution of charges and age for non-smokers')

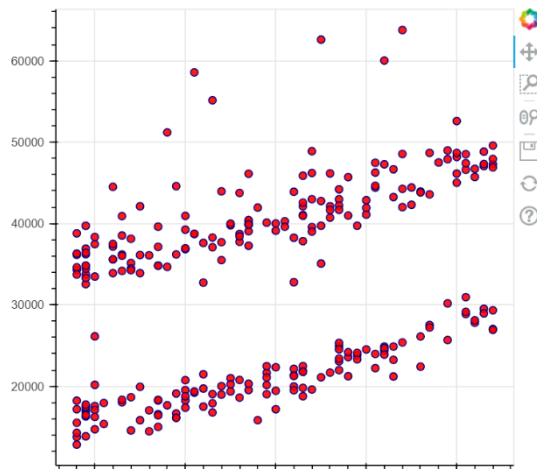


```
In [20]: g = sns.jointplot(x="age", y="charges", data = data[(data.smoker == 1)], kind="kde", color="c")
g.plot_joints(pl.scatter, c="w", s=30, linewidth=1, marker="+")
g.ax_joint.collections[0].set_alpha(0)
g.set_axis_labels("$X$", "$Y$")
ax.set_title('Distribution of charges and age for smokers')
```

Out[20]: Text(0.5, 1.0, 'Distribution of charges and age for smokers')

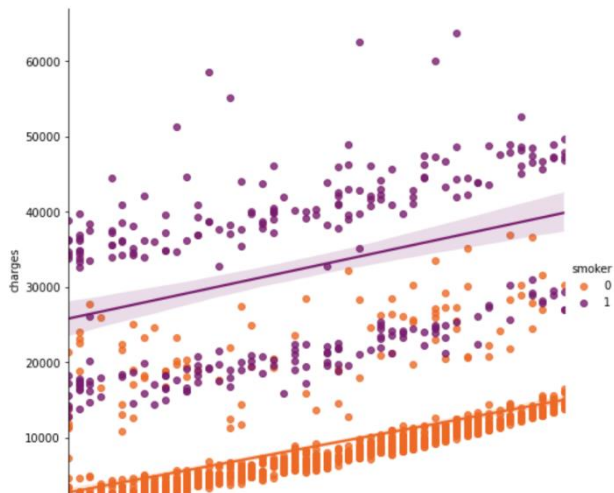


```
In [22]: #smokers
p = figure(plot_width=500, plot_height=450)
p.circle(x=data[(data.smoker == 1)].age, y=data[(data.smoker == 1)].charges, size=7, line_color="navy", fill_color="red", fill_opa=0.5)
show(p)
```

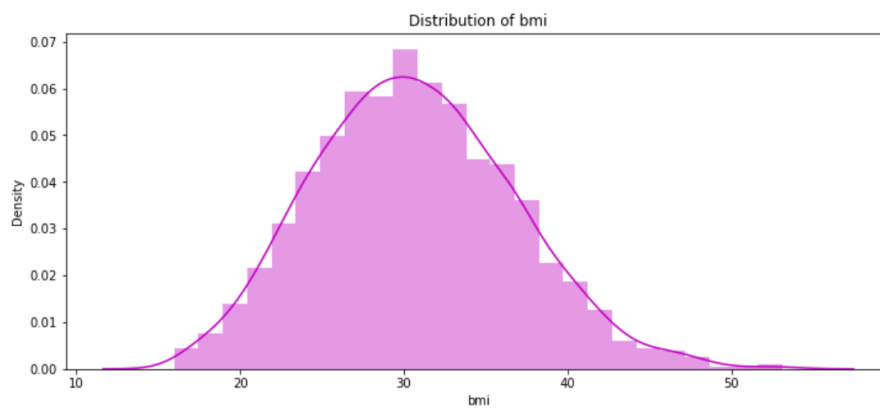


```
In [23]: sns.lmplot(x="age", y="charges", hue="smoker", data=data, palette = 'inferno_r', size = 7)
ax.set_title('Smokers and non-smokers')
```

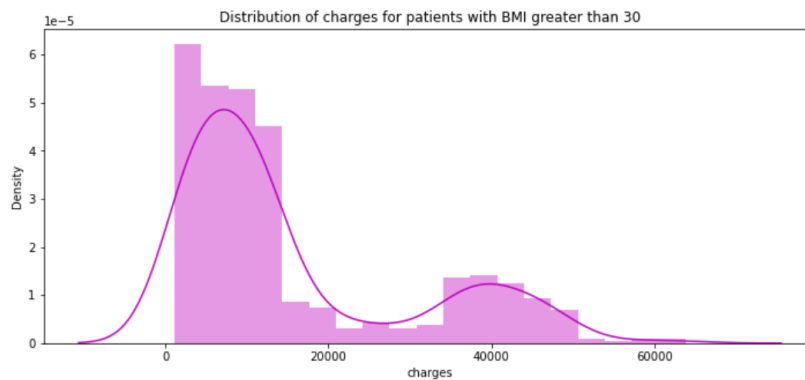
Out[23]: Text(0.5, 1.0, 'Smokers and non-smokers')



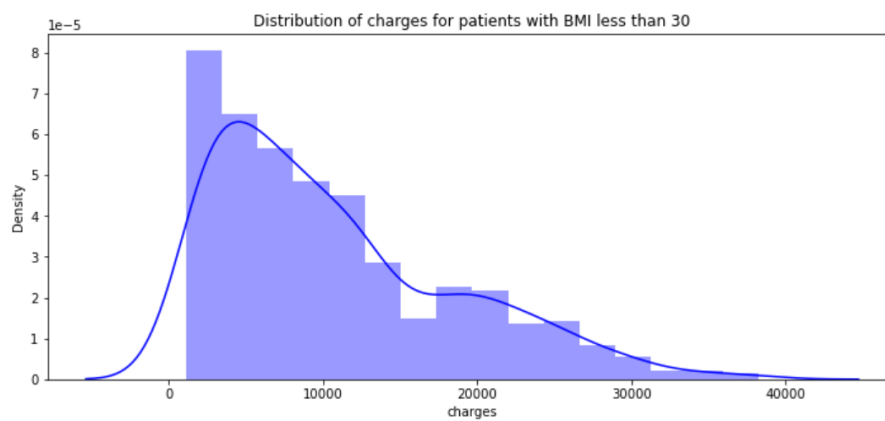
```
In [24]: pl.figure(figsize=(12,5))
pl.title("Distribution of bmi")
ax = sns.distplot(data["bmi"], color = 'm')
```



```
In [25]: ▶ pl.figure(figsize=(12,5))
pl.title("Distribution of charges for patients with BMI greater than 30")
ax = sns.distplot(data[(data.bmi >= 30)]['charges'], color = 'm')
```

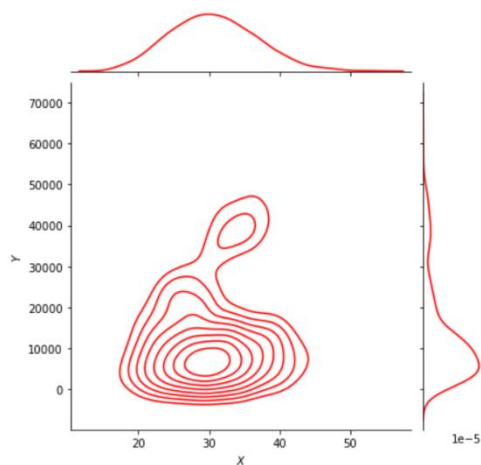


```
In [26]: ▶ pl.figure(figsize=(12,5))
pl.title("Distribution of charges for patients with BMI less than 30")
ax = sns.distplot(data[(data.bmi < 30)]['charges'], color = 'b')
```



```
In [27]: ▶ g = sns.jointplot(x="bmi", y="charges", data = data, kind="kde", color="r")
g.plot_joint(pl.scatter, c="w", s=30, linewidth=1, marker="+")
g.ax_joint.collections[0].set_alpha(0)
g.set_axis_labels("$X$", "$Y$")
ax.set_title('Distribution of bmi and charges')
g.set_axis_labels("$X$", "$Y$")
ax.set_title('Distribution of bmi and charges')
```

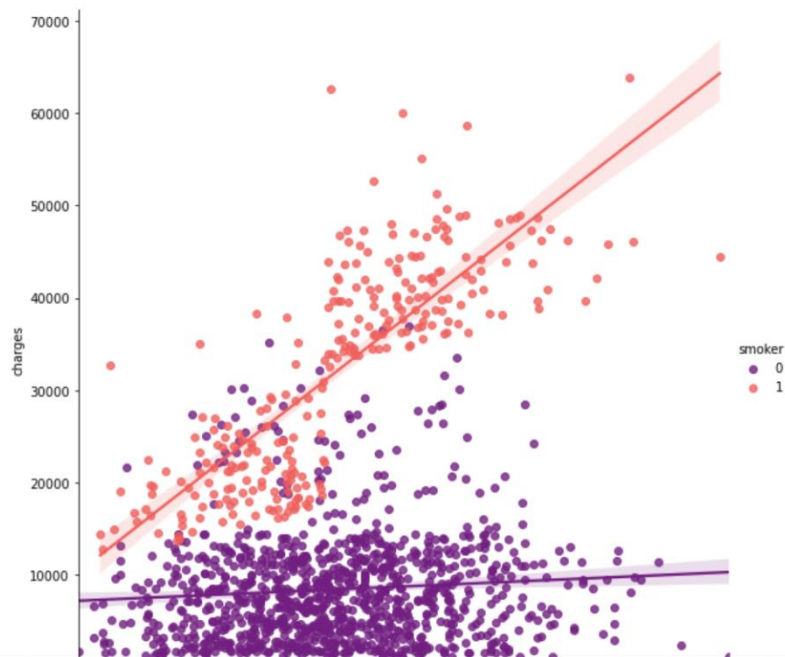
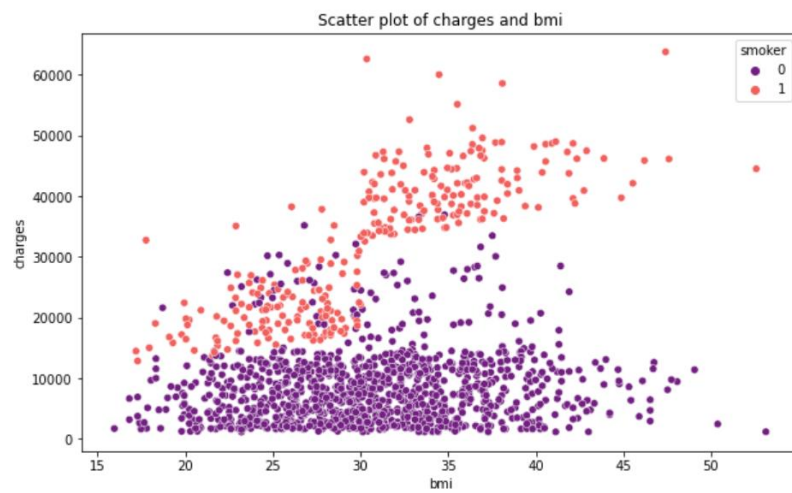
Out[27]: Text(0.5, 1.0, 'Distribution of bmi and charges')



```
In [28]: plt.figure(figsize=(10,6))
ax = sns.scatterplot(x='bmi',y='charges',data=data,palette='magma',hue='smoker')
ax.set_title('Scatter plot of charges and bmi')

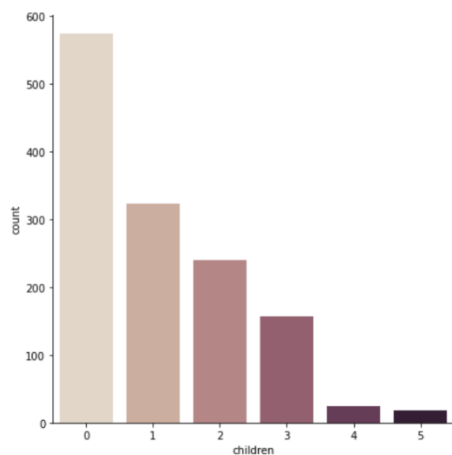
sns.lmplot(x="bmi", y="charges", hue="smoker", data=data, palette = 'magma', size = 8)
```

Out[28]: <seaborn.axisgrid.FacetGrid at 0x29c23bc4c40>



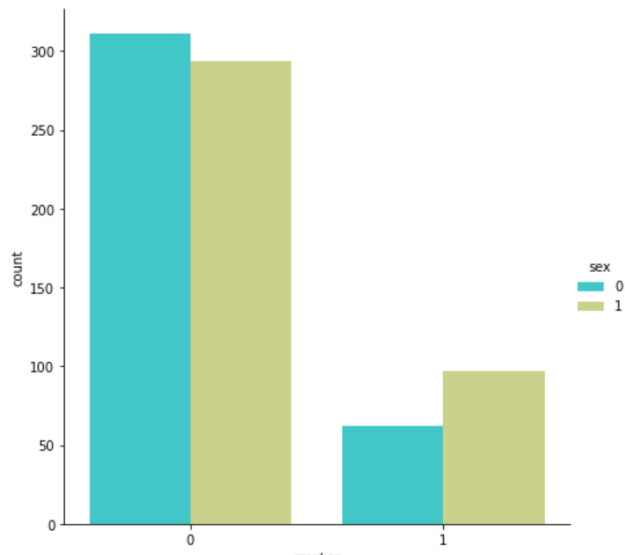
```
In [29]: sns.catplot(x="children", kind="count", palette="ch:.25", data=data, size = 6)
```

```
Out[29]: <seaborn.axisgrid.FacetGrid at 0x29c24c28040>
```



```
In [30]: sns.catplot(x="smoker", kind="count", palette="rainbow", hue = "sex",  
                    data=data[(data.children > 0)], size = 6)  
ax.set_title('Smokers and non-smokers who have childrens')
```

```
Out[30]: Text(0.5, 1.0, 'Smokers and non-smokers who have childrens')
```



```
In [31]: from sklearn.linear_model import LinearRegression  
from sklearn.model_selection import train_test_split  
from sklearn.preprocessing import PolynomialFeatures  
from sklearn.metrics import r2_score, mean_squared_error  
from sklearn.ensemble import RandomForestRegressor
```

```
In [32]: x = data.drop(['charges'], axis = 1)  
y = data.charges  
  
x_train, x_test, y_train, y_test = train_test_split(x, y, random_state = 0)  
lr = LinearRegression().fit(x_train, y_train)  
  
y_train_pred = lr.predict(x_train)  
y_test_pred = lr.predict(x_test)  
  
print(lr.score(x_test, y_test))  
0.7962732059725786
```

```
In [33]: X = data.drop(['charges', 'region'], axis = 1)  
Y = data.charges  
  
quad = PolynomialFeatures (degree = 2)  
x_quad = quad.fit_transform(X)  
  
X_train, X_test, Y_train, Y_test = train_test_split(x_quad, Y, random_state = 0)  
plr = LinearRegression().fit(X_train, Y_train)
```



```

plr = LinearRegression().fit(X_train,Y_train)

Y_train_pred = plr.predict(X_train)
Y_test_pred = plr.predict(X_test)

print(plr.score(X_test,Y_test))

0.8849197344147236

```

```

In [34]: forest = RandomForestRegressor(n_estimators = 100,
                                       criterion = 'mse',
                                       random_state = 1,
                                       n_jobs = -1)

forest.fit(x_train,y_train)
forest_train_pred = forest.predict(x_train)
forest_test_pred = forest.predict(x_test)

print('MSE train data: %.3f, MSE test data: %.3f' % (
mean_squared_error(y_train,forest_train_pred),
mean_squared_error(y_test,forest_test_pred)))
print('R2 train data: %.3f, R2 test data: %.3f' % (
r2_score(y_train,forest_train_pred),
r2_score(y_test,forest_test_pred)))

MSE train data: 3746684.434, MSE test data: 19965476.411
R2 train data: 0.974, R2 test data: 0.873

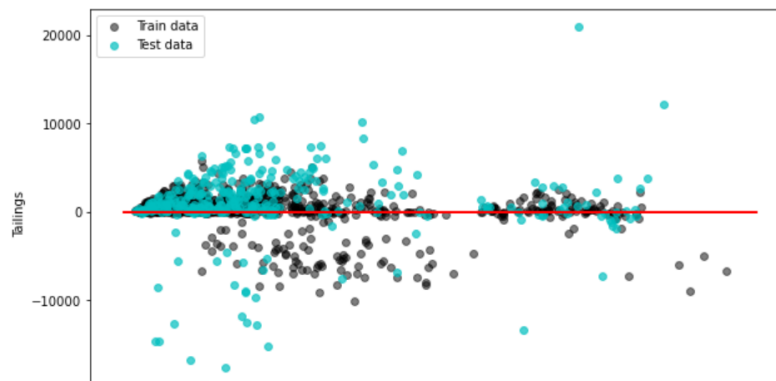
```

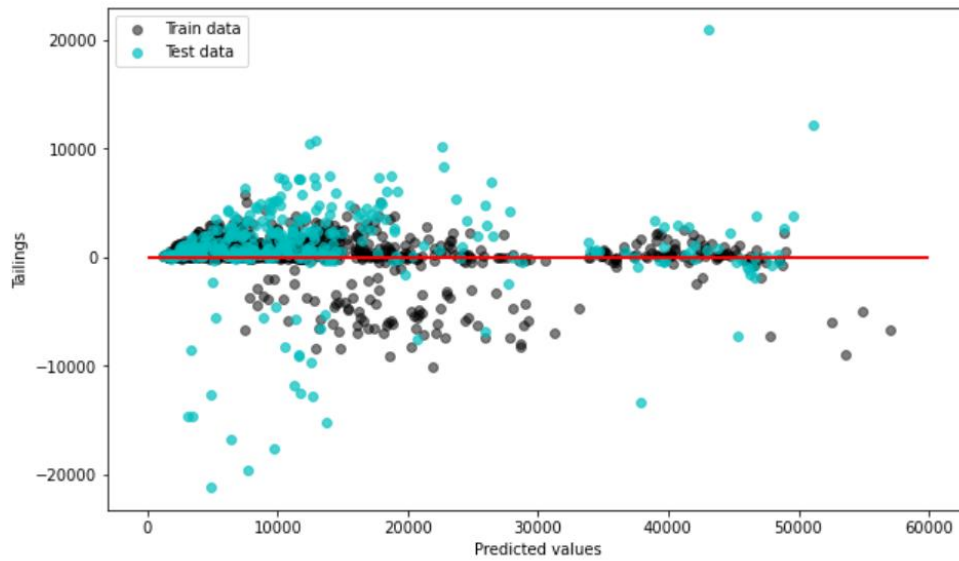
```

In [35]: pl.figure(figsize=(10,6))

pl.scatter(forest_train_pred,forest_train_pred - y_train,
           c = 'black', marker = 'o', s = 35, alpha = 0.5,
           label = 'Train data')
pl.scatter(forest_test_pred,forest_test_pred - y_test,
           c = 'c', marker = 'o', s = 35, alpha = 0.7,
           label = 'Test data')
pl.xlabel('Predicted values')
pl.ylabel('Tailings')
pl.legend(loc = 'upper left')
pl.hlines(y = 0, xmin = 0, xmax = 60000, lw = 2, color = 'red')
pl.show()

```





```
In [37]: import numpy as np
from sklearn.metrics import balanced_accuracy_score

#define array of actual classes
actual = np.repeat([1, 0], repeats=[20, 380])

#define array of predicted classes
pred = np.repeat([1, 0, 1, 0], repeats=[15, 5, 5, 375])

#calculate balanced accuracy score
balanced_accuracy_score(actual, pred)
```

```
Out[37]: 0.868421052631579
```

Accuracy of data set is 0.8684.