CC12 – Statistical Design and Analysis

Colab LabAct6: Test for Independence
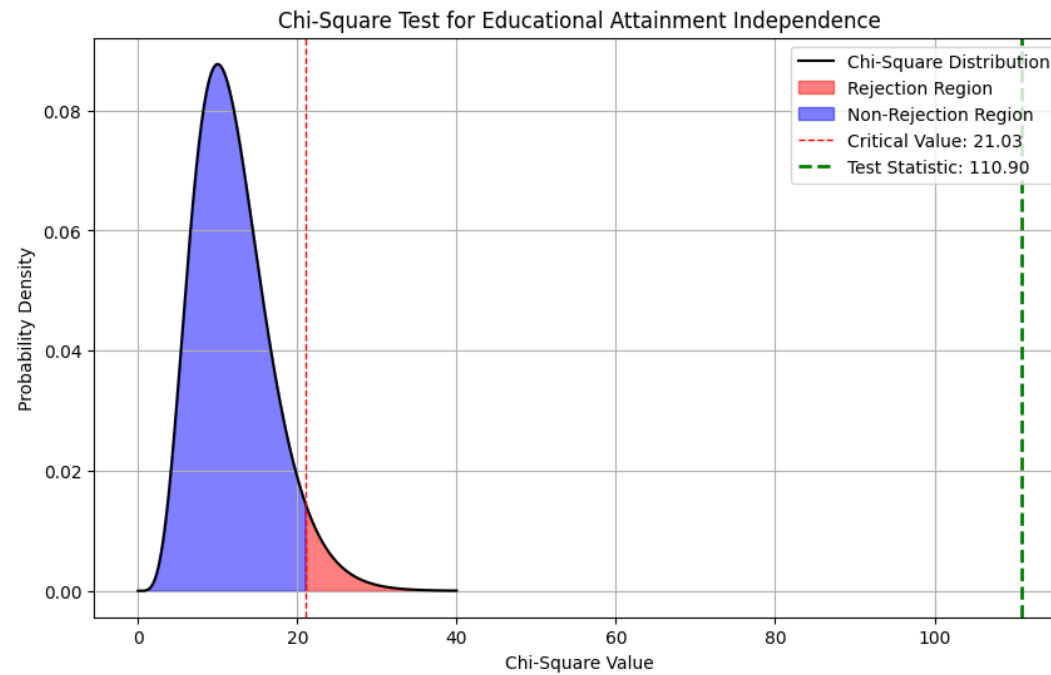
Problem 1:

Is educational attainment independent of race? In 2017, 300 Asians are asked about their educational attainment and 20% are high school graduates, 30% are with bachelor's degree, 20% are with master's degree, 5% are with doctoral degree and the rest are either no degree or not a high school graduate. Out of 400 African American, 33% are high school graduates, 15% are with bachelor's degree, 10% are with master's degree, 1% are with doctoral degree and the rest are either no degree or not a high school graduate. Out of 200 Latinos, 30% are high school graduates, 10% are with bachelor's degree, 5% are with master's degree, 1% are with doctoral degree and the rest are either no degree or not a high school graduate. Lastly, out of 100 White Americans, 30% are high school graduates, 25% are with bachelor's degree, 10% are with master's degree, 2% are with doctoral degree and the rest are either no degree or not a high school graduate. Use 95% confidence level.

Observed Count

		HS_grad	B_degree	M_degree	D_degree	N_d N_hs	R_total
2	Asians	60	90	60	15	75	300
3	African-A	132	60	40	4	164	400
4	Latinos	60	20	10	2	108	200
5	White-A	30	25	10	2	33	100
6	C_total	282	195	120	23	380	1000

Expected Count

		HS_grad	B_degree	M_degree	D_degree	N_d N_hs
10	Asians	85	59	36	7	114
11	African-A	113	78	48	9	152
12	Latinos	56	39	24	5	76
13	White-A	28	20	12	2	38

Curve

Chi-Square Test for Educational Attainment Independence

Conclusion

Reject the null hypothesis: There is significant evidence that educational attainment is not independent of race.