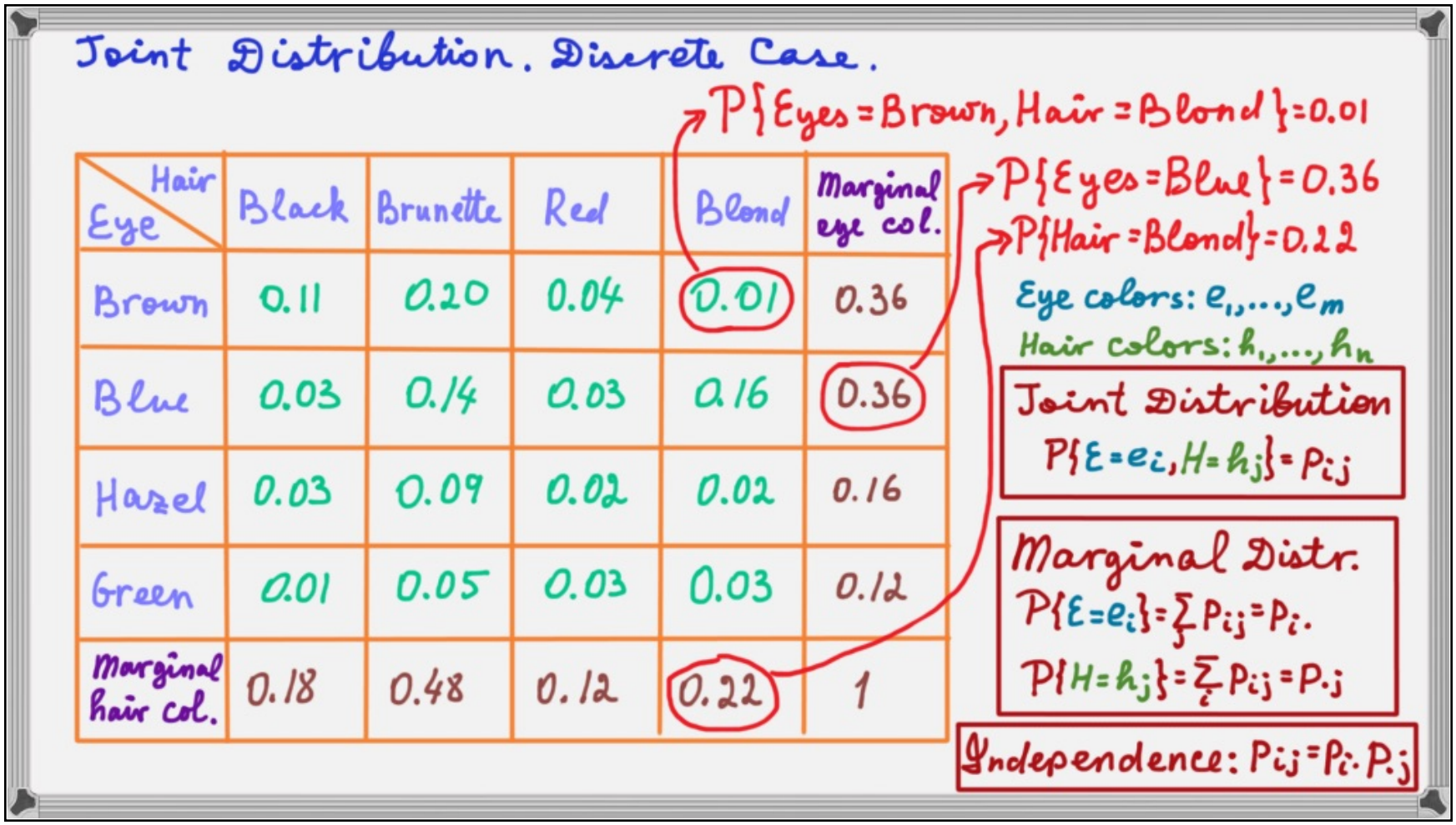
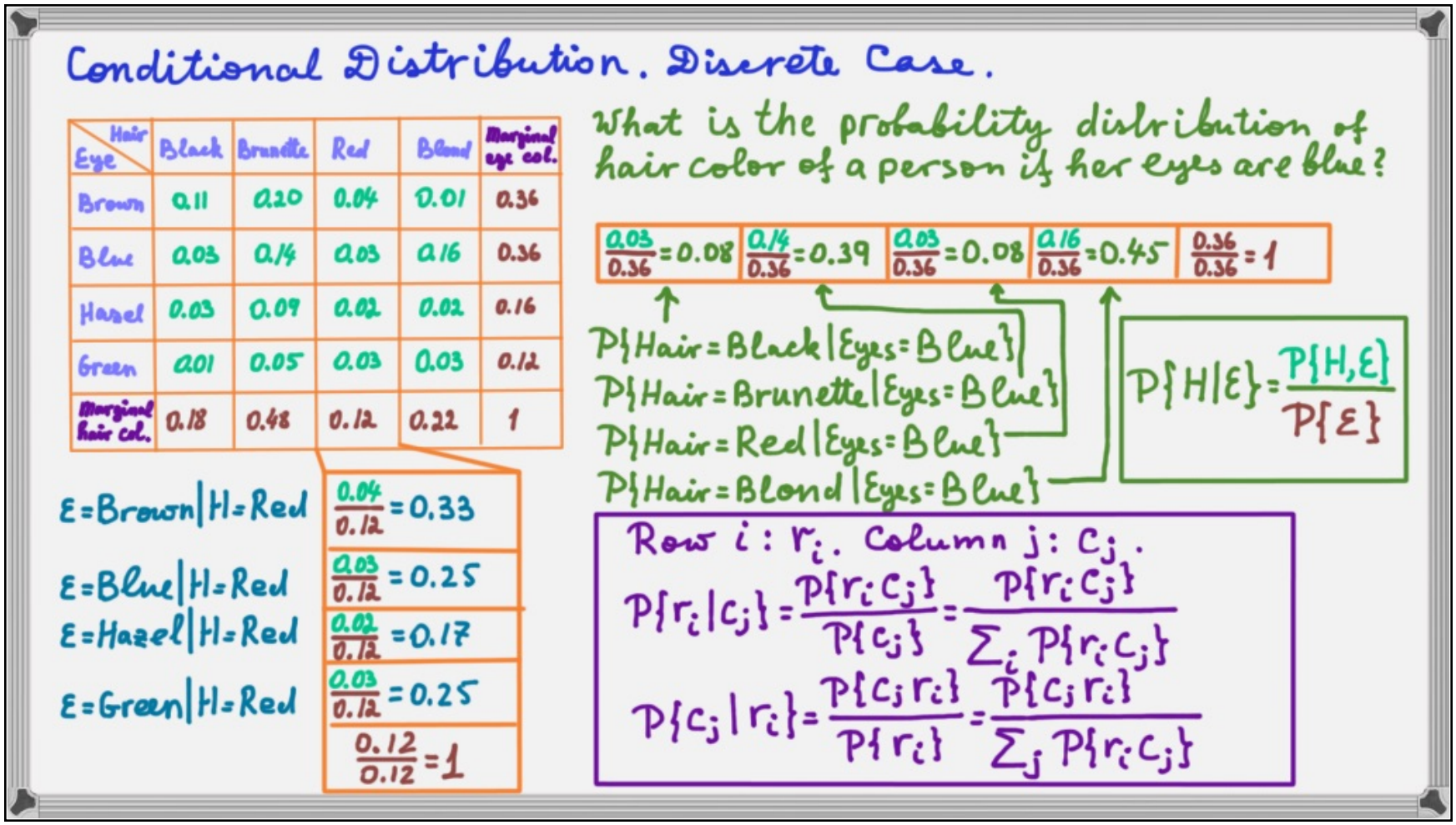


Eye \ Hair	Black	Brunette	Red	Blond	Marginal eye col.
Brown	0.11	0.20	0.04	0.01	0.36
Blue	0.03	0.14	0.03	0.16	0.36
Hazel	0.03	0.09	0.02	0.02	0.16
Green	0.01	0.05	0.03	0.03	0.12
Marginal hair col.	0.18	0.48	0.12	0.22	1


Conditional Distribution. Discrete Case.
What is the probability distribution of hair color of a person if her eyes are blue?
Hair / Eye
Black
Brunette
Red
Blond
Marginal eye col.
Brown 0.11 0.20 0.04 0.01 0.36
Blue 0.03 0.14 0.03 0.16 0.36
Hazel 0.03 0.09 0.02 0.02 0.16
Green 0.01 0.05 0.03 0.03 0.12
Marginal hair col. 0.18 0.48 0.12 0.22 1
E=Brown|H=Red 0.04/0.12 = 0.33
E=Blue|H=Red 0.03/0.12 = 0.25
E=Hazel|H=Red 0.02/0.12 = 0.17
E=Green|H=Red 0.03/0.12 = 0.25
0.12/0.12 = 1
0.03/0.36 = 0.08
0.14/0.36 = 0.39
0.03/0.36 = 0.08
0.16/0.36 = 0.45
0.36/0.36 = 1
P{Hair=Black|Eyes=Blue}
P{Hair=Brunette|Eyes=Blue}
P{Hair=Red|Eyes=Blue}
P{Hair=Blond|Eyes=Blue}
P{H|E} = P{H,E} / P{E}
Row i: r_i. Column j: c_j.
P{r_i|c_j} = P{r_i c_j} / P{c_j} = P{r_i c_j} / Σ_i P{r_i c_j}
P{c_j|r_i} = P{c_j r_i} / P{r_i} = P{c_j r_i} / Σ_j P{r_i c_j}