

Factors Can Be Estimated from Data

$$\text{prob}(\mathbf{R}|\mathbf{N} \text{ AND } \mathbf{I} \text{ AND } \mathbf{F}) \approx \text{prob}(\mathbf{N}|\mathbf{R}) \times \text{prob}(\mathbf{I}|\mathbf{R}) \times \text{prob}(\mathbf{F}|\mathbf{R}) \times \text{prob}(\mathbf{R})$$

The four values can be estimated from the data in the table for each of the four colors, (not just for R(ed)):

$$\text{prob}(\mathbf{N}|\mathbf{R}) = \# \text{ of new red cars} / \# \text{ red cars}$$

$$\text{prob}(\mathbf{I}|\mathbf{R}) = \# \text{ of imported red cars} / \# \text{ red cars}$$

$$\text{prob}(\mathbf{F}|\mathbf{R}) = \# \text{ of red sports cars} / \# \text{ red cars}$$

$$\text{prob}(\mathbf{R}) = \# \text{ of red cars} / \text{total} \# \text{ cars}$$