

## Section 1: Core Probability

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### 1 Warm-Up with Music Preferences

In one prior offering of CS109, the distribution of students by year and their likelihood of liking the song *We Are the Champions* by Queen is shown in the table below. Here, “Graduate +” includes graduate students, CGOE students, coterminal students (everyone not in the other partitions). Let  $L_1$  denote the event that a student likes the song.

Year	% of Students	$P(L_1 \mid \text{Year})$
Freshman	20%	0.23
Sophomore	25%	0.42
Junior	25%	0.39
Senior	10%	0.74
Graduate +	20%	0.89

What is the probability that a randomly chosen student likes *We Are the Champions* by Queen?

### 2 WebMD mini

In this problem, we will compute the probability that a person has a particular disease given that they present with the symptom of a fever. A person may have either *Influenza (Flu)*, *Streptococcal Pharyngitis (Strep)*, or *No Disease*. Assume these outcomes are mutually exclusive, so each person belongs to exactly one of the three groups: Flu, Strep, or No Disease.

In the general population, 8% of people have Influenza (Flu), 4.1% have Streptococcal Pharyngitis (Strep), and the remaining 87.9% have no disease. If a person has the flu, the probability they have a fever is 0.92. If they have strep, the probability they have a fever is 0.86. If they have no disease, the probability they have a fever is 0.01.

For each disease (Flu, Strep, No Disease), compute the probability that a person has that disease given that they present with a **fever**.

