Here is a cross-tabulated information on students' grade and subject preferences in a Nashville high school. *In this case, the subjects can only choose one subject between physics and mathematics.*

General law of Bayes' Theorem:

$$P(A \mid B) = \frac{P(A)*P(B \mid A)}{P(B)}$$

P(A) = Probability of A occurring
P(B) = Probability of B occurring
P(B | A) = Probability of B occurring given that A occurs
P(A | B) = Probability of A occurring given that B occurs

	Freshman	Sophomore	Row Margin
Physics	$P(P)P(P\|F)$=0.35 $P(P\|F)$=0.7 $P(F\|P)$=0.538	$P(P)P(P\|S)$=0.15 $P(P\|S)$=0.3 $P(S\|P)$=0.429	0.5
Math	$P(M)P(M\|F)$=0.3 $P(M\|F)$=0.6 $P(F\|M)$=0.462	$P(M)P(M\|S)$=0.2 $P(M\|S)$=0.4 $P(S\|M)$=0.571	0.5
Column Margin	0.65	0.35	1

P = Physics, M = Mathematics, F = Freshman, S = Sophomore