quiz 9
math2228.04
u new haven

name: Solution

1 (10 points). The U.S. Army released the following statement in 1898 about serving in the Spanish American War:

> Unless an applicant has at least four sound double teech, one above and one below on each side of the mounth, and so opposed as to serve the purpose of mastication, he should be rejected.

The following two-way table contains the rejection data for enlistment candidates classified by age.

	Age					
Rejected	under 20	20–25	25–30	30–35	35–40	over 40
yes	68	647	1114	1783	2887	3801
no	58,884	77,992	55,597	43,994	47,569	39,985

(a) Which variable is the explanatory? Response?
(b) Find the joint distribution. You can use fractions or decimals.
(c) Find the two marginal distributions.
(d) Which conditional distribution would you choose to explain the relationship between the two variables? Justify your answer.
(e) Find the conditional distribution you answered in the previous item.

a) Age is explanatory, Rejected is response.

b) Total enlistment = 334,321

	≤20	20-25	25-30	30-35	35-40	≥40
Yes	$\frac{68}{334321}$	$\frac{647}{334321}$	$\frac{1114}{334321}$	$\frac{1783}{334321}$	$\frac{2887}{334321}$	$\frac{3801}{334321}$
NO	$\frac{58884}{334321}$	$\frac{77992}{334321}$	$\frac{55597}{334321}$	$\frac{43994}{334321}$	$\frac{47569}{334321}$	$\frac{39985}{334321}$

c) Age Marginal

≤20	20-25	25-30	30-35	35-40	≥40
$\frac{58952}{334321}$	$\frac{78639}{334321}$	$\frac{56711}{334321}$	$\frac{45777}{334321}$	$\frac{50456}{334321}$	$\frac{43786}{334321}$

Rejected Marginal

Yes	$\frac{10300}{334321}$
NO	$\frac{324021}{334321}$

d) Condition on yes, rejected. This would allow us to analyze how age is related to having good enough teeth.

c)

	≤20	20-25	25-30	30-35	35-40	≥40
Yes	$\frac{68}{10300}$	$\frac{647}{10300}$	$\frac{1114}{10300}$	$\frac{1783}{10300}$	$\frac{2887}{10300}$	$\frac{3801}{10300}$