ESS 575: Probability Lab 3 - Marginal Distributions

Team England

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Question 1

Fill in Table 2 to estimate the marginal probabilities of presence and absence of the two species. The cells show the joint probability of the events specified in the row and column. The right column and the bottom row show the marginal probabilities.

Table 2: Estimates of marginal probabilities for island occupancy

Events	S	S^c	Marginal
R	$\Pr(S, R) = \frac{2}{32}$	$\Pr(S^c, R) = \frac{9}{32}$	$\Pr(R) = \frac{11}{32}$
R^c	$\Pr(S, R^c) = \frac{18}{32}$	$\Pr(S^c, R^c) = \frac{3}{32}$	$\Pr(R^c) = \frac{21}{32}$
Marginal	$\Pr(S) = \frac{20}{32}$	$Pr(S^c) = \frac{12}{32}$	$\sum = \frac{32}{32}$

What is the sum of the marginal rows? What is the sum of the marginal columns? Why? Note, when we marginalize over R we are effectively eliminating S and vice versa.