Ecostats Homework 2

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1.) Deer Mice

These data come from a study of deer mice population in sagebrush steppe in Utah. Individuals were trapped on 5 nights. The usual notation for classical (Otis) closed population models is:

- t: The number of trapping occasions
- n: number of individuals caught on each trapping occasion (vector of length t)
- $n.$: (ndot) the total number of captures, $n. = \Sigma_{i=1}^{t} n_i$
- M: number of tags in popoulation just prior to occasion i, $M_i = \Sigma_{j=1}^{i-1} u_j$ except $M_1 = 0$
- $M.$: (Mdot) $= \Sigma_{i=1}^{t} M_i$ Note this does not include $M_t + 1$
- M_{t+1}: Total number of unique individuals seen
- u: number of unmarked individuals caught on each occasion (vector of length t)
- m: number of marked individuals caught on each occasion (vector of length t)
- $m.$ (mdot) total captures of marked individuals, $m. = \Sigma_{i=1}^{t} m_i$

Note that $n_i = u_i + m_i$ for all i. Summary statistics for the mark-recapture study of deer mice are:

Parameter	Trap Night 1	Trap Night 2	Trap Night 3	Trap Night 4	Trap Night 5
n_i	14	9	12	11	10
u_i	14	5	11	7	5
m_i	0	4	1	4	5
M_i	0	14	19	30	37