STAT 400

Homework #6

Summer 2017
A. Stepanov

(due Thursday, July 27, by 3:00 p.m.)

Please include your name (with your last name underlined)
and your NetID at the top of the first page.

No credit will be given without supporting work.

1. (Capture – Recapture) To estimate the populations size of squirrels that live on and around the Quad, first N_1 squirrels were captured and tagged. The captured squirrels were then released back onto the Quad. One week later, n squirrels were captured. Assume that the population size has not changed during this week. Let X denote the number of tagged squirrels in the second (recapture) sample.

a) Construct an estimator for the population size N. Hint: Ask MoM.

1. (continued)

Suppose $N_1 = 20$ and $n = 15$.

b) Suppose $x = 4$. Obtain $\widetilde{N}$, an estimate for the population size N.

c) Suppose the actual populations size of squirrels is $N = 70$. What is the probability of getting $x = 4$ tagged squirrels in the recapture step?