# Homework 7
*of*
# STAT 3355 Data Analysis for Statisticians & Actuaries

Due: 11:30 am

April 18 (Monday), 2022

## Problem 1 ($2.5$ points)

An elevator can safely hold $3,500$ lbs. A sign in the elevator limits the passenger count to $15$. If the adult population has a mean weight of $180$ lbs with a $25$ lbs standard deviation, how unusual would it be, if the central limit theorem applied, that an elevator holding $15$ people would be carrying more than $3,500$ pounds? (Hint: if $X$ is a random variable indicating a person's weight, then assume $X \sim$ Normal$(\mu = 180, \sigma^2 = 25^2)$; use related `d`, `p`, `q`, and `r` functions to get the numerical answer.)

## Problem 2 ($2.5$ points)

A restaurant sells an average of $25$ bottles of wine per night, with a variance of $25$. Assuming the central limit theorem applies, what is the probability that the restaurant will sell more than $600$ bottles in the next $30$ days? (Hint: if $X$ is a random variable indicating one day sale, then assume $X \sim$ Poisson$(\lambda = 25)$; use related `d`, `p`, `q`, and `r` functions to get the numerical answer.)

## Problem 3 ($2$ points)

Currently, there are $52$ enrolled students in STAT 3355. It is known that $13.1\%$ of the population in U.S. are left-handed. A student wishes to find the proportion of left-handed people in this class. She surveys $30$ students and finds that only $2$ are left-handed. If she computes a $95\%$ confidence interval, would it contain the value of $13.1\%$?

## Problem 4 ($3$ points)

For the `babies` dataset in the package `UsingR`, the variable `age` contains the mother's age and the variable `dage` contains the father's age. Find a $95\%$ confidence interval for the difference in mean age. Does it contain $0$? What do you assume about the data?