1. Write an R function \( f(n, \mu, \sigma) \) that draws \( n \) observations from a normal distribution with mean \( \mu \) and standard deviation \( \sigma \) and sums them (you may use the \texttt{sum()} function in your function). Make the default values \( n = 100, \mu = 0, \sigma = 1 \). In your R Markdown code, include the code that defines this function in a code chunk with options \texttt{eval=FALSE, echo=TRUE}, so that it will display your code but not actually evaluate it.

2. Familiarize yourself with the \texttt{MASS::mvrnorm()} function. Use this function to write your own R function \( f(x_{\text{min}}, n, \rho) \) (with defaults of \( n = 100, \rho = 0.75 \)) that draws \( n \) observations from a bivariate normal distribution with covariance matrix

\[
\begin{bmatrix}
1 & \rho \\
\rho & 1
\end{bmatrix}
\]

and mean vector equal to \( c(0, 0) \), and that then returns the sample means of the \( x \) and \( y \) values for all the observations with \( x > x_{\text{min}} \). That is, your function should return two values: the sample mean of the \( x \) values satisfying the constraint, and the sample mean of the \( y \) values satisfying the constraint. (As an aside, because of the type of distribution, these sample means are already standardized, so this function gives you a demonstration of regression to the mean.)

In your R Markdown code, include the code that defines this function in a code chunk with options \texttt{eval=FALSE, echo=TRUE}, so that it will display your code but not actually evaluate it.

3. Box/Hunter/Hunter, Chapter 4, Problem 3 (page 171). \textit{Note:} In class we discussed Problem 2, which was my mistake. Please do Problem 3. Just apply the techniques that we talked about in class where it asks you to “make any analysis you feel is appropriate, including a graphical analysis”. What I said about Problem 2 applies equally well to Problem 3, and I would like you to do Problem 3.