3. Read the INTRODUCTION section and the SIMPLE LINEAR REGRESSION section of Chapter 3, from page 72 to 80. Suppose we are interested in a simple linear regression where the dependent variable (i.e., \( Y \) variable) is the job satisfaction score, and the independent variable (i.e., \( X \) variable) is square root of the reflected satisfaction with supervisor score (and not the actual supervisor score).

(a) Use SPSS to obtain the displays in Figures 3.2, 3.3, 3.4A, and 3.4B in the textbook, and to do the calculations needed for the corresponding simple linear regression. If necessary, you can read the steps to guide you on how to do this by going to the document titled Using SPSS for Windows (which can be accessed from the appropriate link on the course syllabus web page), going to the section titled Hypothesis Tests Involving Two Variables, and reading the steps in the subsection titled Performing a Simple Linear Regression with Checks of Linearity, Homoscedasticity, and Normality Assumptions. Once you have successfully generated SPSS output, add a title to the top of the output in the following format:

YOUR NAME – Job Satisfaction Exercise 3(a)

(b) Use the SPSS output to find each of the following:

\[
\begin{align*}
  n &= 214 \\
  \bar{x} &= 4.28246 \\
  \bar{y} &= 66.10 \\
  r &= -0.356 \\
  \sum(x - \bar{x})^2 &= 429.874
\end{align*}
\]
3.-continued

(c) Use the SPSS output to find the equation of the least squares line.

\[ \text{jobsat} = \text{ANSWERS WILL BE AVAILABLE SOON!} \]

(d) Write a one-sentence interpretation of the slope in the least squares line.

(e) Find the coefficient of determination, and write a one-sentence interpretation.

(f) Find the standard error of estimate.
In the Word document named *Job_Satisfaction_Result_Summaries* (created previously), begin a section titled **Job Satisfaction Exercises 3**. In this section, create a subsection for each of parts (g), (i), and (j) which follow, and in each subsection created, write the summaries for the corresponding part. Print the page(s) and insert them immediately after this page.

(g) A 0.05 significance level is chosen for a hypothesis test to see if there is any evidence that the regression to predict the job satisfaction score from the square root of the reflected satisfaction with supervisor score. Write the results of this hypothesis test in a format suitable for a journal article to be submitted for publication.

(h) Considering the results of the hypothesis test in part (g), decide whether or not a 95% confidence interval for the regression coefficient would be of interest. If yes, find and interpret the confidence interval; if not, explain why.

(i) A 0.05 significance level is chosen for a hypothesis test to see if there is any evidence that the mean job satisfaction score is different from 64 for Arab and Jewish social services employees whose satisfaction with supervisor score is 31. Write the results of this hypothesis test in a format suitable for a journal article to be submitted for publication. Considering the results of the hypothesis test, decide whether or not a 95% confidence interval for the mean job satisfaction score for Arab and Jewish social services employees whose satisfaction with supervisor score is 31 would be of interest. If yes, find and interpret the confidence interval; if not, explain why.

(j) Find and interpret a 95% prediction interval for the job satisfaction score for Arab and Jewish social services employees whose satisfaction with supervisor score is 31.

(k) For what satisfaction with supervisor will the confidence interval for mean job satisfaction score and the prediction interval for a particular job satisfaction score both have the smallest length?