**Module 4 Assignment**

Overview: This assignment is asking you to prepare a report that contains descriptive statistics and recommendations. Complete all the required statistics using R.

Instructions: Use the .csv worksheet “Module 4 Assignment.csv” for your data. Write your report in Word. The report should contain the tables and figures you think are necessary for the report. Attach your Word report and your R code file when submitting in Canvas.

Case Study Description: Helen managed a major manufacturing facility that was devoted largely to producing millions of identical small metallic parts. While the parts produced were (intended to be) identical, the facility produced them by using hundreds of presses, of three different types (which we'll call machine types 1, 2, and 3). The rated production rate for machine type 1 is 700 parts per minute, machine type 2 is rated at 200 parts per minutes, and machine type 3 is rated at 150 parts per minute, respectively, but actual production rates varied. Helen felt that factors such as quality of input material, worn or "changed-out" dies, and dirty or poorly maintained presses would probably affect production.

The facility had always kept daily production records, but from what Helen could tell, no one ever consulted them or did anything with them other than to put them in file cabinets at the end of each reporting period. She thought that in principle she should be able to monitor production rates for the types of machines, identify any machines that seemed to be in need of adjustment, and characterize the amount of downtime to be expected. Accordingly, she extracted one day's production records for 120 presses at her facility.

The machines were scheduled for a shift of 7.75 hours each day. The number of hours each machine was recorded as operating and the actual quantities of parts produced by each machine were determined from automatic counters on the machines. The number of hours each machine was down, or inoperative, for any reason, was recorded manually on clipboards next to each machine. The data were derived from these logs.

Prepare a report that contains descriptive statistics and gives advice to Helen. At a minimum report descriptive statistics for machine percent efficiency ( PROD / 'Expected Prod' ) \* 100, hours machines were operating, and hours machine were down.

Definitions for the variables in the Minitab worksheet:

V1 = MTYPE: Type of press (1, 2, or 3)

V2 = PROD: Total parts produced by the machine during the hours that the machine was operating.

V3 =HRSWRK: Number of hours that the machine was operating.

V4 =HRSDOWN: Number of hours the machine was down, or inoperative, for any reason.