Student: Stivale Saavedra **Date:** 9/8/15 **Time:** 4:06 PM	**Instructor:** Derek Blythe **Course:** MAT-240-X6099-15EW6 **Book:** Southern New Hampshire University: Math130/Math240	**Assignment:** 8-2 MyStatLab: Module Eight Problem Set

13.1.20-T. A highway safety institution conducts experiments in which cars are crashed into a fixed barrier at 40 mph. In the institute's 40-mph offset test, 40% of the total width of each vehicle strikes a barrier on the driver's side. The barrier's deformable face is made of aluminum honeycomb, which makes the forces in the test similar to those involved in a frontal offset crash between two vehicles of the same weight, each going just less than 40 mph. You are in the market to buy a family car and you want to know if the mean head injury resulting from this offset crash is the same for large family cars, passenger vans, and midsize utility vehicles (SUVs). The data in the accompanying table were collected from the institute's study. Complete parts (a) through (d) below.

Click the icon to view the data table.

(a) State the null and alternative hypotheses.

- A. H_0: $\mu_{Cars} = \mu_{Vans} = \mu_{SUVs}$ and H_1: all means are different
- B. H_0: $\mu_{Cars} = \mu_{Vans} = \mu_{SUVs}$ and H_1: at least one mean is different
- C. H_0: $\mu_{Cars} = \mu_{Vans} = \mu_{SUVs}$ and H_1: $\mu_{Cars} < \mu_{Vans} < \mu_{SUVs}$

(b) Normal probability plots indicate that the sample data come from normal populations. Are the requirements to use the one-way ANOVA procedure satisfied?

- A. No, because the samples are not independent.
- B. No, because the populations are not normally distributed.
- C. No, because the largest sample standard deviation is more than twice the smallest sample standard deviation.
- D. Yes, all the requirements for use of a one-way ANOVA procedure are satisfied.

(c) Test the hypothesis that the mean head injury for each vehicle type is the same at the $\alpha = 0.01$ level of significance.

Use technology to find the F-test statistic for this data set.

$F_0 =$ ☐ (Round to three decimal places as needed.)

Determine the P-value and state the appropriate conclusion below.

Since the P-value is ☐, there is ☐ (sufficient / insufficient) evidence to reject the null hypothesis. Thus, we

13.1.20-T. (cont.)

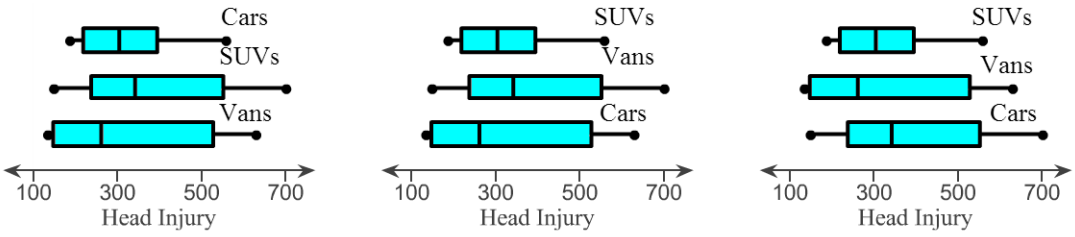
can / cannot conclude that the means are different at the $\alpha = 0.01$ level of significance.

(Round to four decimal places as needed.)

(d) Draw boxplots of the three vehicle types to support the results obtained in part (c).

Choose the correct graph below.

○A. ○B. ○C.



Head Injuries

Large Family Cars	Passenger Vans	Midsize Utility Vehicles (SUVs)
262	147	224
133	240	218
409	343	184
528	700	304
149	554	352
627	471	557
167	321	393