#### Question 1

To compare commuting times in various locations, independent random samples were obtained from the six cities presented in the “Longest Commute to Work” graphic on page 255 in your textbook. The samples were from workers who commute to work during the 8:00 a.m. rush hour. One-way Travel to Work in Minutes

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Atlanta | Boston | Dallas | Philadelphia | Seattle | St. Louis |
| 29 | 18 | 42 | 29 | 30 | 15 |
| 21 | 37 | 25 | 20 | 23 | 24 |
| 20 | 27 | 26 | 33 | 31 | 42 |
| 15 | 25 | 32 | 37 | 39 | 23 |
| 37 | 32 | 20 | 42 | 14 | 33 |
| 26 | 34 | 26 |   |   | 18 |
|   | 48 | 35 |   |   |   |

* Construct a graphic representation of the data using six side-by-side dot plots.
* Visually estimate the mean commute time for each city and locate it with an X.
* Does it appear that different cities have different effects on the average amount of time spent by workers who commute to work during the 8:00 a.m. rush hour? Explain.
* Does it visually appear that different cities have different effects on the variation in the amount of time spent by workers who commute to work during the 8:00 a.m. rush hour? Explain.

**Part 2**

* Calculate the mean commute time for each city depicted.
* Does there seem to be a difference among the mean one-way commute times for these six cities?
* Calculate the standard deviation for each city’s commute time.
* Does there seem to be a difference among the standard deviations between the one-way commute times for these six cities?

**Part 3**

* Construct the 95% confidence interval for the mean commute time for Atlanta and Boston.
* Based on the confidence intervals found does it appear that the mean commute time is the same or different for these two cities (Atlanta and Boston). Explain
* Construct the 95% confidence interval for the mean commute time for Dallas.
* Based on the confidence intervals found in (Atlanta and Boston) and Dallas does it appear that the mean commute time is the same or different for Boston and Dallas? Explain.
* Based on the confidence levels found in (Atlanta and Boston) and (Dallas) does it appear that the mean commute time is the same or different for the set of three cities, Atlanta, Boston, and Dallas? Explain
* How doe your confidence intervals compare to the intervals given for Atlanta, Boston, and Dallas in “Longest Commute to Work” on page 255?

#### Question 2

Interstate 90 is the longest of the east-west U.S. interstate highways with its 3,112 miles stretching from Boston, MA at I-93 on the eastern end to Seattle WA at the Kingdome on the western end. It travels across 13 northern states; the number of miles and number of intersections in each of those states is listed below.

|  |  |  |
| --- | --- | --- |
| State | No. of Inter | Miles |
| WA | 57 | 298 |
| ID | 15 | 73 |
| MT | 83 | 558 |
| WY | 23 | 207 |
| SD | 61 | 412 |
| MN | 52 | 275 |
| WI | 40 | 188 |
| IL | 19 | 103 |
| IN | 21 | 157 |
| OH | 40 | 244 |
| PA | 14 | 47 |
| NY | 48 | 391 |
| MA | 18 | 159 |

* Construct a scatter diagram of the data.
* Find the equation for the line of best fit using x= miles and y=intersections.
* Using the equation found in part (b), estimate the average number of intersections per mile along I-90.
* Find a 95% confidence interval for β1.
* Explain the meaning of the interval found in part d.