Grade 9: Statistics Worksheet

Objectives:

- Merkezi eğilim ve yayılım ölçülerini verileri yorumlamada kullanır.
  - Aritmetik ortalama, ortanca, tepe değer, en büyük değer, en küçük değer ve açıklık kavramları hatırlatılır.
  - Bir veri grubuna ait alt çeyrek, üst çeyrek, çeyrekler açıklığı ve standart sapma tanımlanır.
  - Merkezi eğilim ve yayılım ölçüleri kullanılarak gerçek/gerçekçi hayat durumları yorumlanır.

Necessary materials:

- TI84 Plus Graphing Display Calculator
- Paper-pencil

Time required: 10-20 minutes

Question:

Between 2009 and 2013, the numbers of traffic accidents in some cities of Turkey are given below in Table#1.

Table1.

	2009	2010	2011	2012	2013
Adana	3649	3502	3358	3231	3260
Bursa	3670	3412	3405	3201	3312
Mersin	3604	3519	3398	3439	3040
Kayseri	3784	3670	3456	3103	2987

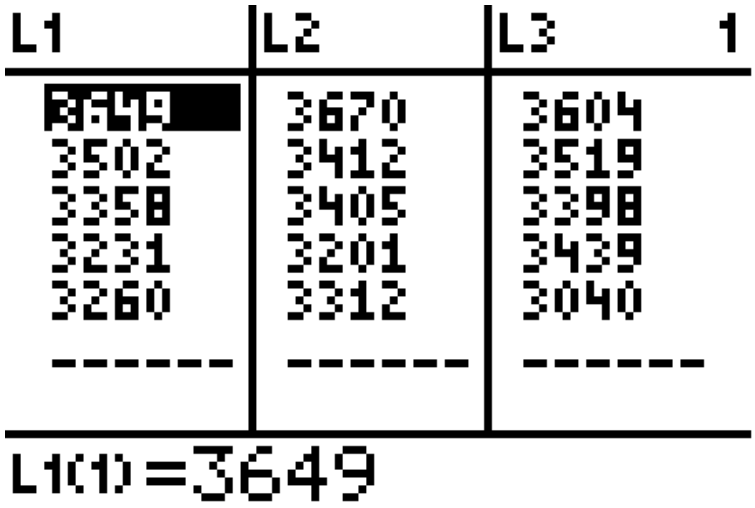
According to the given data, fill Table#2 and Table#3 given below and decide which city is more risky than the others?

Steps to calculate the values placed in the table:

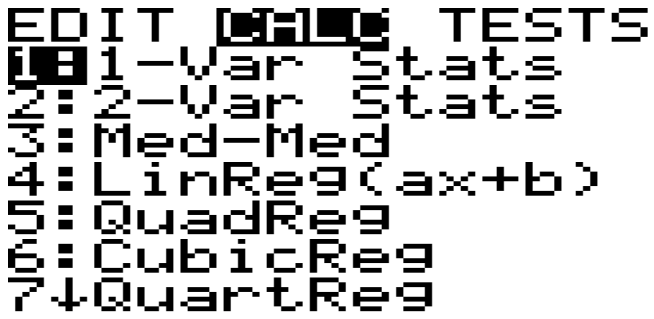
S1: Press **STAT** on your calculator. You will see **1: Edit.** Press **ENTER**.

S2: To enter the data into the list, first clear the lists if necessary. To be able to clear the whole list, use the cursor buttons and come to the list's name which is at the top. Then press **CLEAR** and **ENTER**.

S3: Write down the first value and press **ENTER**. Do the same thing for each data. Get the other lists in the same way. You will get such an image on the screen of your calculator (Notice that L_1 is for the data for Adana; similarly L_2 is for Bursa, L_3 is for Mersin and L_4 will be for Kayseri):



S4: After entering the data sets, press **STAT** and move your cursor on **CALC**.



S5: Press **ENTER**. See the list part. You may need to change the list name. To enter L_1, press **2ND** and **1**; for L_2, press **2ND** and **2**; for L_3, press **2ND** and **3**; and for L_4, press **2ND** and **4**.

S6: Move on the **CALCULATE** and press **ENTER**. You will have the values which are seen on your screen. Fill the Table#2 according to these values. Then move the cursor down and fill Table#3 regarding this part.

Here are the images for L_1 data set:

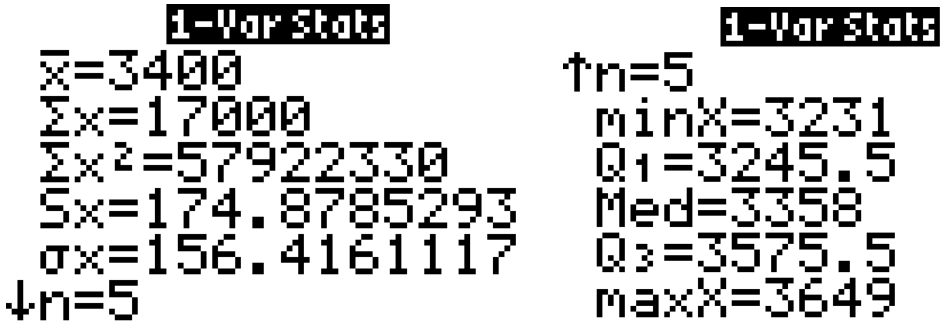


Table2.

	n	$\sum x$	$\overline{x}$	σx
Adana				
Bursa				
Mersin				
Kayseri				

Table3.

	minX	Q_1	Med	Q_3	maxX
Adana					
Bursa					
Mersin					
Kayseri					

- After filling the tables, consider on the values and decide which city is more risky than the others. Justify your answer:

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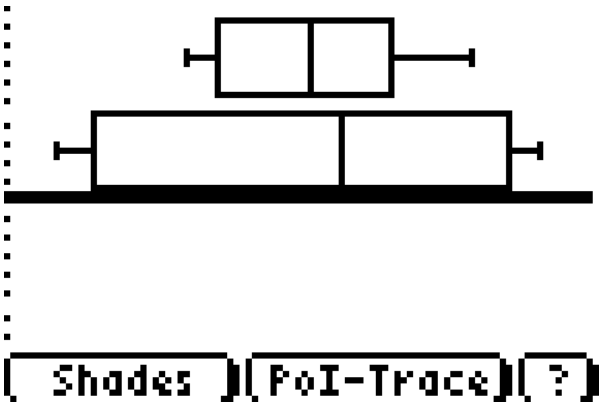
- For Bursa and Kayseri, sketch the boxplots (Press **2ND STAT PLOT** and **ENTER**. Be sure the cursor is on **ON** and press **ENTER**. By moving the cursor on the fifth type, press **ENTER**. For Xlist, choose L_2 by pressing **2ND** and **2**. Follow the same way for L_4 data set. Press **GRAPH.** At all, press **ZOOM9**). you should get such an image on your screen:



- By considering the image above and the values on Table3; explain your findings about the minimum and maximum values, median, Q_1 and Q_3.

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Reflection

The purpose of this worksheet was to provide 9th grade students to investigate where and in what conditions standard deviation are used by TI84 Plus Graphing Display Calculator. I aimed to meet the objectives of the topic by helping students to construct their own knowledge during the worksheet. Since I observed students have difficulties to understand the meaning of standard deviation and where to use it, I designed the data sets to have the same average. Therefore; to be able to decide the most risky city, students will need to look for standard deviation and interpret the meaning of it.

To make sense the real life connection, I examined the statistics of traffic accidents in Turkey's cities for the last few years and designed the question by adjusting the real data. Additionally, I tried to give short and clear instructions on the calculator since the students are on 9th grade level and may not be used to use technology. Because of the same reason, although there is no strong need to the quartiles for this question, just to make students to be familiar with the meaning of quartiles, I designed Table3 and the last explanation part on the worksheet.