

Help Finding a Car

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Executive Summary

Trying to get a good deal on a car can be a daunting project. Many websites offer you guidelines for what you can expect an individual car to spend, but looking up each option and verifying if it is a fair price can be very time-consuming. My Excel project is meant to help my friends and family look for cars and narrow down their options.

The workbook allows you to search local listings for certain cars and lists all of them. After listing the local listings, the workbook can look nationwide and check for the same car, get its average price, get the standard deviation, and tell you where in relation to the national average, the local cars fit in price-wise.

Write-Up

The purpose of this project is to compare the local listings for cars against the national average for the same car. The project can be split into three parts: (1) Ensuring data is entered in correctly via custom ribbon options that direct the user to a userform which contains car names formatted correctly; (2) searching KSL for the requested car listings and returning placing them in Excel; (3) searching nationwide listings for the same car (with Autotrader), computing the average price, computing the standard deviation, and placing the local listings into their appropriate deviation from the mean.

Besides meeting with Professor Allen, I had no assistance on this project. I asked Professor Allen for help on some of my problems and was able to get them all resolved. I wanted to intensify my project past the scope in hopes of making my project more robust but I ran into a couple of problems. Those problems are listed below.

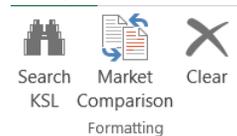
1. Ensuring data is entered in correctly
 - a. Userform
 - i. In order to avoid users from entering in values that are not valid for either website, I created a userform called "Find a Car." In this model there are drop-down boxes for Make/Model and Mileage because the way the websites treated these two values was different at times but always very particularly.
 1. A Nissan Armada for KSL is a NISSAN PATHARMADA for Autotrader while a Toyota 4Runner for KSL is a TOYOTA HIGHLANDER for Autotrader and a Chevrolet Suburban for KSL is a CHEV CHEVSUB.
 - ii. All of the other fields in the userform are text boxes. The two websites are not picky about the values entered here as long as the user uses valid dates and whole numbers for the prices. Separate tabs for the possible mileage values used for the mileage drop-down box and for the possible make/model values used for the make/model drop-down box were created. Although adding values to the list is easy, additions to the make/model fields need to be checked to make sure no changes need to be made in the code for values that don't equal each other in KSL and Autotrader.

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1. The userform had something that I couldn't figure out. I wanted to make the 'Make/Model' field two separate fields. The 'Make' field was simple to make. I wanted to make it so if you selected a certain car manufacturer from the 'Make' drop down field, I wanted only the models related to that manufacturer to show in the 'Model' drop down.

b. Ease of use

- i. Pressing 'Search KSL' in the 'Find Cars' tab opens up the 'Find a Car' window where users enter in their search criteria. Pressing <Run> starts a query in KSL off the parameters entered in the window. Instead of many different buttons on the screen, a custom tab contains all the user needs to search KSL for local listings.
- ii. Pressing 'Market Comparison' in the 'Find Cars' tab prompts a different macro to query Autotrader for the already entered parameters. Further explanation of the macro and what it does will be found below.
- iii. Pressing 'Clear' in the 'Find Cars' tab removes all KSL search results and market comparisons.



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- v. Something I learned during this portion of my project was how to use a custom button to call a user form that either runs a macro or stops the process if <Cancel> is pressed.

2. Searching KSL

a. What this macro does

- i. After obtaining the search parameters from the screen that the userform filled in, the macro searches KSL for the specified car. The macro fills in the CarsList tab with the results from the search. Included in the results is the URL for each listing.

b. Obstacle - Search returns more than 18 results

- i. The way the page numbers are accounted for in the source code are different for results that have one, two and more than three pages of results. Trying to identify a way to use a loop to move to the next screen was very difficult. In the end I pulled the total results count from the top of the source code, divided it by

18 (the max number of results per page), and rounded the value up. This returned the total number of results pages.

- ii. The second page of results has an entirely unique URL from the original search results URL. After opening the first page of results and scraping its results, I had to use the new URL (which sequences by page number minus one) for the remaining pages of results.

3. Market Comparison

a. What this macro does

- i. After listing all of the search results from KSL in the CarsList tab, pressing the 'Market Comparison' button on the 'Find Cars' tab will start the compareData macro. This macro uses the previously filled in search parameters Autotrader only for listings all over the nation. These results are placed in the 'CompareList' tab. After all of the listing have been added to the 'CompareList' tab, the average and standard deviation of the price column is computed.

| | A | B | C |
|----|-------------------------|-------|---------|
| 1 | Description | Price | Mileage |
| 2 | Used 2013 Toyota 4Run | 41995 | 8029 |
| 3 | Used 2013 Toyota 4Run | 41985 | 19373 |
| 4 | Certified 2013 Toyota 4 | 39995 | 21680 |
| 5 | Used 2013 Toyota 4Run | 39977 | 24803 |
| 6 | Certified 2013 Toyota 4 | 38995 | 33467 |
| 7 | Used 2013 Toyota 4Run | 38988 | 40751 |
| 8 | Certified 2013 Toyota 4 | 38956 | 8941 |
| 9 | Certified 2013 Toyota 4 | 38884 | 23933 |
| 10 | Certified 2013 Toyota 4 | 38788 | 55759 |
| 11 | Used 2012 Toyota 4Run | 38334 | 38176 |
| 12 | Certified 2013 Toyota 4 | 38305 | 15704 |
| 13 | Used 2013 Toyota 4Run | 38275 | 31309 |
| 14 | Used 2013 Toyota 4Run | 38206 | 47736 |
| 15 | Used 2012 Toyota 4Run | 37999 | 20358 |
| 16 | Certified 2013 Toyota 4 | 37995 | 21901 |
| 17 | Certified 2013 Toyota 4 | 37995 | 28730 |
| 18 | Used 2013 Toyota 4Run | 37995 | 49406 |
| 19 | Certified 2013 Toyota 4 | 37991 | 12996 |
| 20 | Used 2013 Toyota 4Run | 37990 | 27634 |
| 21 | Certified 2012 Toyota 4 | 37987 | 43699 |
| 22 | Certified 2013 Toyota 4 | 37980 | 42889 |

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- ii. With the standard deviation and average price computed, the macro navigates to the 'CarList' tab. On this tab there are columns titled "Awesome," "Good," "Average," and "Above Average." The "Awesome" column refers to a price two standard deviations below the average. The "Good" column refers to a price one standard deviation below the average. The "Average" column refers to a price below the average. The "Above Average" column refers to a price one standard deviation above the average.

- 1. An enhancement I wanted to make to this portion had to deal with the limitations of Autotrader. Autotrader doesn't allow you search for a range of mileages for their used cars. You are only allowed to select the maximum mileage you want to search for. I wanted to only compute the average for a range of mileages searched for in KSL (I didn't even allow you to search for a range of mileages in the userform because of the Autotrader limitation) amongst the Autotrader results (and the corresponding standard deviation). Using this new average and standard deviation, the results would be more accurate.

- iii. If the local listing price is either "Awesome," "Good," "Average," or "Above Average," the market comparison price will be highlighted indicating how the price for the local listing compares to the market.

| # | A | B | C | D | E | F | G | H | I | J | |
|----|--------------------|---------|----------------|-------|-------|--|---|---------|-------|---------|---------------|
| 1 | | | | | | | | | | | |
| 2 | Car Make: | Toyota | Car Year From: | 2012 | | | | | | | |
| 3 | Model: | 4Runner | Car Year To: | 2013 | | | | | | | |
| 4 | Mileage Less Than: | 60000 | Price From: | 15000 | | | | | | | |
| 5 | Keyword: | | Price To: | 45000 | | | | | | | |
| 6 | | | | | | | | | | | |
| 7 | | | | | | | | | | | |
| 8 | Toyota | 4Runner | 2012 | 54967 | 26950 | www.ksl.com/auto/listing/27640687ad_cid=1 | | Awesome | Good | Average | Above Average |
| 9 | Toyota | 4Runner | 2012 | 32905 | 28999 | www.ksl.com/auto/listing/25472307ad_cid=2 | | 25325 | 28731 | 32137 | 35543 |
| 10 | Toyota | 4Runner | 2013 | 34000 | 34000 | www.ksl.com/auto/listing/28537807ad_cid=3 | | 25325 | 28731 | 32137 | 35543 |
| 11 | Toyota | 4Runner | 2013 | 37283 | 31000 | www.ksl.com/auto/listing/28454817ad_cid=4 | | 25325 | 28731 | 32137 | 35543 |
| 12 | Toyota | 4Runner | 2012 | 38576 | 27648 | www.ksl.com/auto/spot/special/click/2727219/BS4138?url=/auto/listing/2727219 | | 25325 | 28731 | 32137 | 35543 |
| 13 | Toyota | 4Runner | 2012 | 52600 | 25999 | www.ksl.com/auto/listing/28532917ad_cid=6 | | 25325 | 28731 | 32137 | 35543 |
| 14 | Toyota | 4Runner | 2013 | 19531 | 29900 | www.ksl.com/auto/listing/26321617ad_cid=7 | | 25325 | 28731 | 32137 | 35543 |
| 15 | Toyota | 4Runner | 2012 | 58700 | 32500 | www.ksl.com/auto/listing/27658677ad_cid=8 | | 25325 | 28731 | 32137 | 35543 |

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 - b. Obstacle 1 – different names for car makes and models (described above)
 - c. Obstacle 2 – page counter only goes up to ten
 - i. If there were more than ten pages of results, the page counter would still only go up to ten.
 - ii. I calculated the total number of pages of results by looking at the total listings counter, dividing it by 100, and then round up to the next integer.
 - d. Obstacle 3 – Only the last listing showing comparison data
 - i. I was using a For...Next loop to look through all of the KSL listings to fill in values for the comparison data.
 - ii. I switched to a Do Until...Loop loop to add comparison values for all the KSL listings.
 - e. Obstacle 4 – a case sensitive URL
 - i. After many tries, I discovered that the Autotrader URL is case sensitive. Upon make changes to my entered search parameters (UCASE), everything worked well.
 - f. Obstacle 5 – very spread out listing values in the source code
 - i. The values used to indicate where in the source code to go to pull the car description, price, and mileage were not very unique or close together for each listing.