



Homework #1

Kennel Club Dog Registration Problem

Background Information

The Kennel Club is the United Kingdom's largest organization dedicated to the health and welfare of dogs. The group recognizes over 200 breeds of dogs divided into seven groups: hounds, gundogs, terriers, utility, working, pastoral, and toy.



Each year, the births of over 200,000 puppies are registered with The Kennel Club [1]. Puppies can only be registered if both parents are of the same breed and already registered. Registered dogs have a known pedigree, which can be helpful in determining the likelihood of future problems.

Problem Statement

In this assignment, students will analyze breed registration and vulnerable breed statistics by rank and annual rates of change to find changing trends.

Instructions

IMPORTANT: Complete the steps below in the order they are given. Completing the steps out of order may complicate the assignment or result in an incorrect result.

1. Download and extract the provided Data Files ZIP file. It contains the following file for use in this assignment:
 - a. **registrations.csv** – Statistics on Kennel Club registrations of dog groups for the years 2003 through 2022 [2].

Column Name	Type	Description
Year	Number	Year of the data.
Hound	Number	Newly registered dogs in hound group.
Working	Number	Newly registered dogs in working group.
Terrier	Number	Newly registered dogs in terrier group.
Gundog	Number	Newly registered dogs in gundog group.
Pastoral	Number	Newly registered dogs in pastoral group.
Utility	Number	Newly registered dogs in utility group.
Toy	Number	Newly registered dogs in toy group.
Total Registrations	Number	Total number of newly registered dogs.

2. Create a new Microsoft Excel workbook named **hw1_lastname_firstname_kcdrp.xlsx**.
3. We must adjust the sheets in our workbook.
 - a. Rename *Sheet1* to *Registrations*.
 - b. Add a new sheet named *Analysis Questions*.



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4. Import the following item into the workbook:
 - a. **registrations.csv** file – Import starting in cell **A3** of the *Registrations* sheet. The file is comma-delimited. Its first row contains headers.
5. We wish to apply formatting to the *Registrations* sheet.
 - a. We must set up a table to store data on registrations.
 - i. If a table does not already exist in cells **A3** through **I23**, create one using a style of your choice. The table has headers and will overlap external data ranges. If prompted, convert the selection to a table and remove all external connections.
 - ii. If a table already exists in cells **A3** through **I23**, format the table using a style of your choice other than the default table style.
 - b. We need to add additional columns to store rank and percentage data.
 - i. Insert two new table columns to the right of existing column **I**.
 - c. For the table, turn on the **Total Row** option.
 - d. Enter text in the cells as indicated below:
 - i. **A1**: Kennel Club Dog Registrations - *Firstname Lastname*
 - ii. **J3**: Total Registrations Rank
 - iii. **K3**: Hound Percentage
 - e. Merge-and-center cells **A1** through **K1**.
 - f. Set the font size to 16-point for cell **A1**.
6. We need to perform calculations to analyze the *Registrations* sheet data.
 - a. In column **K**, calculate the percentage of total registrations from hound using the formula:
$$\frac{[Hound]}{[Total Registrations]}$$
 - b. In column **J**, use the `RANK.EQ()` function to rank each year by its total registrations.
 - c. We would like to summarize the registration data.
 - i. In the total row, individually sum columns **B** through **I**.
 - ii. In the total row, do not display any statistics in columns **J** and **K**.



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7. We must apply additional formatting to the *Registrations* sheet.
 - a. Format the cells as indicated below:
 - i. **B4** through **I24**: number with no decimal places, use 1000 separator
 - ii. **K4** through **K23**: percentage with 1 decimal place
 - b. AutoFit the widths of columns **A** through **K**.
 - c. Apply conditional formatting to the hound percentage in cells **K4** through **K23**.
 - i. If the percentage was less than 5.5% (< 0.055), change the cell fill color to red and the text color to white.
 - ii. If the percentage was at least 7.5% (≥ 0.075), change the fill color to green and the text color to white.
8. We wish to create a chart to plot the number of dog registrations for each year.
 - a. Create a 2-D line chart based on cells **A3** through **I23** of the *Registrations* sheet. Move the chart to a new sheet named *Registrations Chart*.

Ensure the years are shown as labels for the horizontal (category) axis, not plotted as chart data. Specify appropriate chart and axis titles.
 - b. Add a trendline based on the total number of hound-type registrations. Use the trendline type that best fits the data and forecast the values forward 10 periods (through the year 2032). Display the **R-squared** value on the chart.

NOTE: You cannot use the *Moving Average* type for your trendline.
9. We need to set up the *Analysis Questions* sheet so that it can store responses to the analysis questions.
 - a. Enter text in the cells as indicated below:
 - i. **A1**: Question Number
 - ii. **B1**: Response
 - b. Bold the contents of row **1**.
 - c. AutoFit the width of column **A**. Set the width of column **B** to 100.
 - d. Set the height for rows **2** through **4** to 110.
 - e. Change the vertical alignment setting for columns **A** and **B** so that the text is displayed at the top of each row.
 - f. Turn on text wrapping for column **B**.



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10. Starting in row **2** of the *Analysis Questions* sheet, answer three of the five analysis questions below. Respond to one question per row.
- Which trendline type did you use on *Registrations Chart*? Why did you choose this type of trendline?
 - Review the total number of dog registrations for the Kennel Club, especially years around the COVID-19 pandemic. What do the numbers show? Provide a possible explanation for the pattern you are seeing.
 - Do you believe the breeds on the vulnerable and at-risk lists represent a form of self-fulfilling prophecy? Why or why not?
 - What might lead to a sudden increase or decrease of a particular breed's popularity?
 - What effect might the increase of animal rescue adoptions have on registrations for the Kennel Club? Explain your reasoning.

Grading Rubric

This assignment is worth 60 points. It will be graded by your instructor using this rubric, with partial credit awarded as appropriate:

Steps 3a-b	2 points total	Steps 7a-b	3 points total
Step 4	3 points	Steps 7c(i)-(ii)	4 points total
Steps 5a-f	6 points total	Step 8a	10 points
Step 6a	5 points total	Step 8b	6 points
Step 6b	5 points total	Steps 9a-f	4 points total
Steps 6c(i)-(ii)	3 points total	Steps 10a-e (pick 3 of 5)	3 points each

The analysis questions in Steps 10a-e will be evaluated using this rubric:

Standard	Meets Requirements (1.5 points)	Does Not Meet Requirements (0 points)
Answer is reasonable.	Answer addresses the question prompt and is factually correct or a reasonable interpretation of available data.	Answer does not address the question prompt, is factually incorrect, or is an unreasonable interpretation of available data.
Answer is supported.	Logical rationale is provided to support the given answer.	Logical rationale is not provided to support the given answer.

Acknowledgments

The image in the introduction appears courtesy of Brian M. Powell [3].



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References

- [1] "Breed standards," *The Kennel Club*, Sep. 05, 2023. Available:
<https://www.thekennelclub.org.uk/breed-standards/>.
- [2] "Breed registration statistics," *The Kennel Club*, 2023. Available:
<https://www.thekennelclub.org.uk/media-centre/breed-registration-statistics/>.
- [3] B. M. Powell, *Archie at Spruce Knob*. 2019.