

Project Title

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Project Description

Should be in paragraph form (not bullets). Written for a 3rd party such as your client's boss, or an external review board. As part of your description, consider the following:

- *Type of study [Designed experiment, Observational study, Sample survey] and brief description of design*
- *Stage of the experiment [Planning stage or Analysis stage]*
- *Objective of study and role of this analysis*
- *Scope of project*
- *Intended use for results*

Research Questions

What are the overarching research questions that the client is targeting?

Question 1:

Question 2:

...

(order them by priority; RQ1 is highest priority)

Statistical Questions (*optional*)

May address any of the following

- *What (if any) specific statistical questions did the client provide?*
- *Re-phrasing the overall research question into testable hypotheses.*
- *What statistical concerns will you be addressing to insure a comprehensive analysis?*

Question 1:

Question 2:

...

(order corresponding to research questions, if needed)

Variables

What is (are) possible explanatory and response variables? Relevant notes about how each is measured/recorded.

A table is recommended here.

If design is complex, here is a good place to write a detailed description.

Exploratory Data Analysis (EDA)

Description of important variables. - summary statistics - missing Data - unusual or concerning observations

Relevant summary figures that provide intuition for the research questions and/or inform important modelling decisions (correlation structure, etc).

Describe important outcomes of the EDA that the reader should notice.

Example

These are interesting remarks about data summaries. The overall mean fuel economy in the data is 20.090625 miles per gallon, which I can calculate in-line since it's very simple. Most code requires a code chunk, but raw code and output should never appear in the body of the report. Here's a nice table of summary statistics formatted for the report.

Table 1: Summary Statistics for Fuel Economy by Cylinders

cylinders	min	Q1	median	Q3	max	mean	sd	n	missing
4	21.4	22.80	26.0	30.40	33.9	26.66364	4.509828	11	0
6	17.8	18.65	19.7	21.00	21.4	19.74286	1.453567	7	0
8	10.4	14.40	15.2	16.25	19.2	15.10000	2.560048	14	0

Table 2: Summary Statistics for Engine Displacement by Cylinders

cylinders	min	Q1	median	Q3	max	mean	sd	n	missing
4	71.1	78.85	108.0	120.65	146.7	105.1364	26.87159	11	0
6	145.0	160.00	167.6	196.30	258.0	183.3143	41.56246	7	0
8	275.8	301.75	350.5	390.00	472.0	353.1000	67.77132	14	0

```
## `geom_smooth()` using formula 'y ~ x'
```

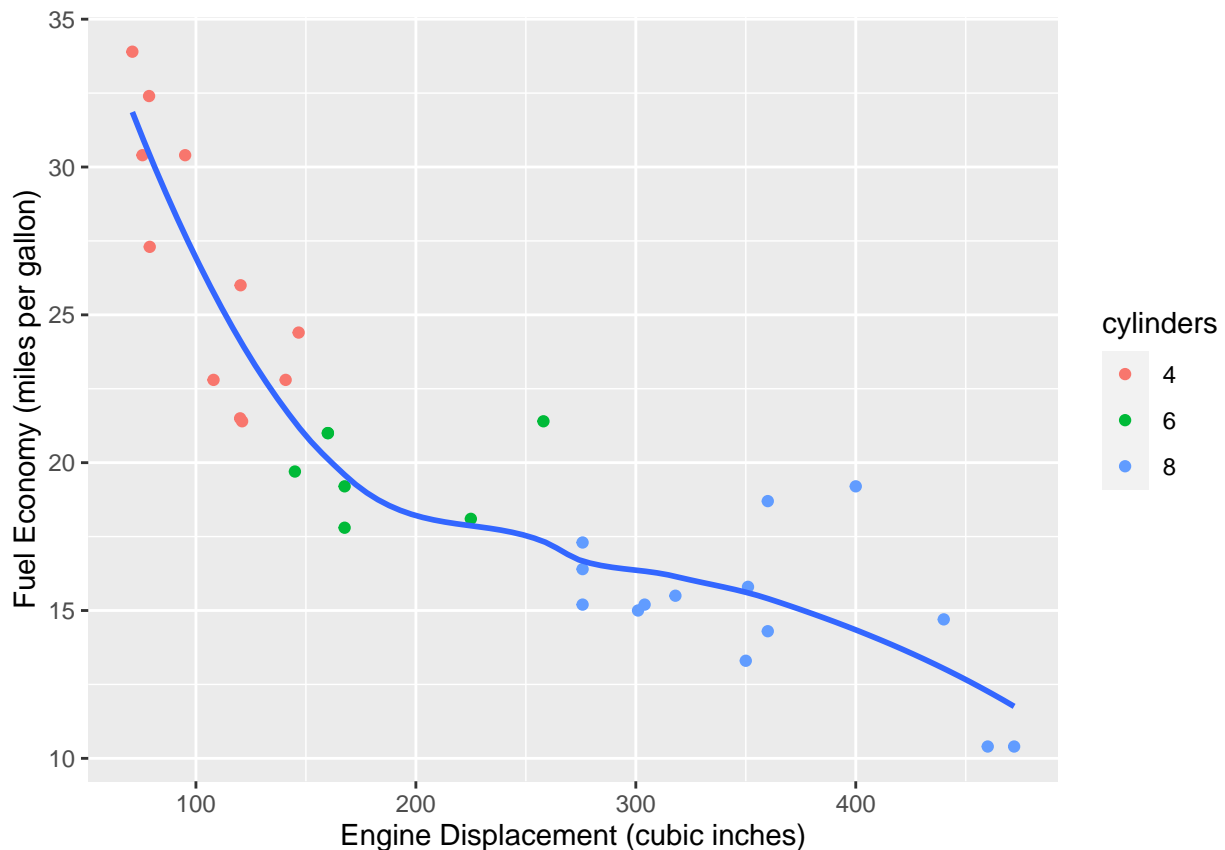


Figure 1: Here's a caption for my figure.

Statistical Analysis

Describe statistical analysis in terms that your client will be able to understand and perhaps use in presenting their own research. This section should summarize all relevant analyses that lead to your final conclusions/decisions/recommendations, but should NEVER include visible code (folded code chunks are fine) or unformatted software output.

- *Model Assumptions & how checked/verified (details left to appendix)*
- *Interpretation of estimates/statistics/p-values IN CONTEXT*
- *Enough detail that the model/analysis could be reproduced by another statistician*

Recommendations

Succinct response to each question laid out in 1.2. This a much shorter version of section 3, and focuses on conclusions rather than the analyses.

Question 1:

Question 2:

(all research questions in 1.1 and/or statistical question in 1.2 should be addressed, in the same order)

Resources

List resources that your client might find useful

Additional Considerations

- *Limitations to the recommendations*
- *Concerns you may have about the study; suggestions for similar studies in future*
- *Technical comments*

Technical Appendix

Detailed information and a copy of code and or software results. Additional graphs and supporting figures may also be placed in the appendix.

R Script

```
# clean up & set default chunk options
rm(list = ls())
knitr::opts_chunk$set(echo = FALSE)

# packages
library(tidyverse) # for example
library(mosaic)    # for example

# user-defined functions

# inputs
data("mtcars") # for example

# Data Cleaning
mtcars <-
  mtcars %>%
  mutate(cylinders = as.factor(cyl))

# MPG summary statistics
favstats(mpg ~ cylinders, data = mtcars) %>%
  knitr::kable(caption = "Summary Statistics for Fuel Economy by Cylinders")

favstats(displ ~ cylinders, data = mtcars) %>%
  knitr::kable(caption = "Summary Statistics for Engine Displacement by Cylinders")

# Figure 1
mtcars %>%
  ggplot(aes(x = displ, y = mpg)) +
  geom_point(aes(color = cylinders)) +
  geom_smooth(method = "loess", se = 0) +
```

```
xlab("Engine Displacement (cubic inches)") +  
ylab("Fuel Economy (miles per gallon)")
```