# U D A C I T Y

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# Explore and Summarize Data

Student Notes      Code Review      Project Review

## ⟳ Does Not Meet Specifications

### Code Functionality                                                    ⌄

SPECIFICATION
All code is functional (e.g. No Error is produced and RMD document is not prevented from bring knit.)

✓ MEETS SPECIFICATION

**Reviewer Comments**
Code is functional, well done.

SPECIFICATION
The project almost never uses repetitive code where a function would be more appropriate. The code references variables by name instead of using constants or column numbers.

☆ EXCEEDS SPECIFICATION

**Reviewer Comments**
Amazing job employing custom functions.

Requirements to exceed the specification ›

### Project Readability                                                    ⌄

SPECIFICATION
All complex code is adequately explained with comments. It is always clear what the code is doing.

✓ MEETS SPECIFICATION

**Reviewer Comments**
Code is not too complex to require many comments.
**To Exceed**
Some extra comments should be added to help future programmers navigate the document.

suggest that comments are added on parts of the code doing any of the following:

- Added / modified variable(s) to the dataset
- Create a function
- Some really tricky plotting techniques that you may want to revisit later.

Check the following link if you are interested in taking your R coding to the next level:
https://google.github.io/styleguide/Rguide.xml

Requirements to exceed the specification ›

SPECIFICATION
The code uses formatting techniques to improve code readability. All lines are shorter than 80 characters.

⟳ DOES NOT MEET SPECIFICATION

**Reviewer Comments**
Please refactor the code so that all lines of code are 80 characters or shorter.
As a suggestion, RStudio can draw a vertical line at 80 characters for you so that it's easy to check. This webpage shows how to do that with 'show margin'.

This is great coding, know that this habit is a standard for Google engineers. Imagine that! You are practising the same habit with some of the best

engineers on Earth!

Here is a small code snippet to clarify what is being asked for in the RMD file.(*The following is just an example and doesn't resemble the code found on the current RMD file*)



```
```{r, echo=FALSE}
ggplot(pld, aes(y = ListingCategory..Alpha., x = LoanOriginationDateAsDate)) + geom_point(alpha = 0.01)
```
```

Margin →

The code should not go beyond the margin.

Requirements to exceed the specification ⌄
The code uses formatting techniques in a consistent and effective manner to improve code readability. All lines are shorter than 80 characters.

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SPECIFICATION

Markdown syntax is used in the code to improve readability of the knitted file.

There are no large sections of the knitted HTML file with bad readability.

🔁 DOES NOT MEET SPECIFICATION

**Reviewer Comments**
Overall the report look great, there are a few thing to consider in order to pass this section. Warnings and code shouldn't be displayed in the final report, also it would be best to add fig.width and fig.height to have constant dimensions for the graphs.
To make things easier, I recommend adding a global knitr chunk in the beginning of your rmd file as follows, Using Knitr global chunks is strongly encouraged, this demonstrates a deeper understanding of the R language and help increase readability or the final Knitted HTML document.

```
{r global_options, include=FALSE} knitr::opts_chunk$set(fig.width=12, fig.height=8, fig.path='Figs/', echo=FALSE, warning=FALSE, message=FALSE)
```

If interested in reading a bit more about R's Knitr functionality:
http://yihui.name/knitr/demo/minimal/

Requirements to exceed the specification ❯

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# Quality of Analysis  ⌄

SPECIFICATION

The project appropriately uses univariate, bivariate, and multivariate plots to explore most of the expected relationships in the data set.

✓ MEETS SPECIFICATION

**Reviewer Comments**
The analysis does an amazing job depicting interesting relationships and is well structured so that all readers can learn. Great plots are found in every section of the analysis with sufficient reasoning and statistical support.
**To Exceed**
It would be great to discuss a statistical model, try to build a model to determine certain categorical variable. The model doesn't have to be too advance, as long as basic concepts are grasped. Consider adding snippets, scores and output of the model in the report. If a model was definitely not employed please provide a couple of reason why. Here are a couple of website and text where you can find deeper information:
http://blog.minitab.com/blog/adventures-in-statistics/regression-analysis-tutorial-and-examples
http://www.law.uchicago.edu/files/files/20.Sykes_.Regression.pdf
http://blog.minitab.com/blog/adventures-in-statistics/how-to-choose-the-best-regression-model

Requirements to exceed the specification ❯

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SPECIFICATION

Questions and findings are placed between blocks of R code regularly so it is clear what the student was thinking throughout the analysis.

✓ MEETS SPECIFICATION

**Reviewer Comments**
**suggestion**
Right now, to add perfection to the report i would strongly recommend adding an introduction at the beginning, before any variables are explored.

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SPECIFICATION

Reasoning is provided for the plots made throughout the analysis. Plots made follow a logical flow. Comments following plots accurately reflect the plots' contents.

✓ MEETS SPECIFICATION

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SPECIFICATION

The project contains at least 20 visualizations. The visualizations are varied and show multiple comparisons and trends. Relevant statistics such as means, medians, quartiles, or confidence intervals are computed throughout the analysis when an inference is made about the data.
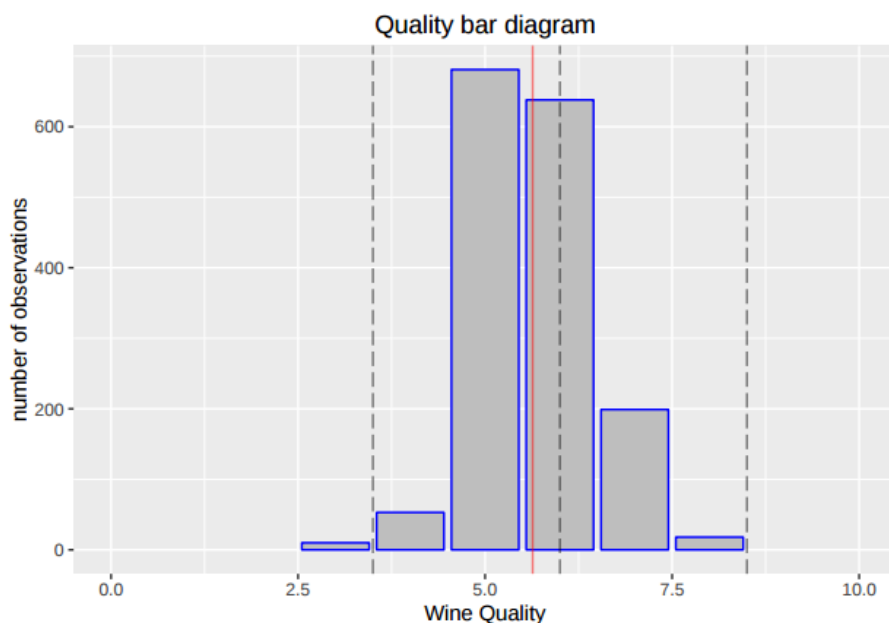
✓ MEETS SPECIFICATION

**Reviewer Comments**

Great job with you visualization in general, good relationships were analyzed.

**To Exceed**

Consider adding more statistics that contribute to a deeper understanding of the data. It is recommended to have statistics like means and medians plotted in your graphs to improve visualization and comparison for readers. Please consider the following plot as an useful example:



Requirements to exceed the specification ❯

SPECIFICATION

Visualizations made in the project depict the data in an appropriate manner that allows plots to be readily interpreted. Choices of plot type and parameters aid interpretability.

🔄 DOES NOT MEET SPECIFICATION

**Reviewer Comments**

I really enjoyed the visualizations, very professional and insightful. Please consider attending the following suggestion.

- The labels for x and y axis and the correlation values in the ggpairs figure are a little difficult to read. You can fix that quite easily by removing the axis ticks ("theme(axis.text = element_blank())") and choosing a short descriptive names for each feature. You can also decrease the font size of the correlations values. This link may be helpful: http://stackoverflow.com/questions/8599685/how-to-change-correlation-text-size-in-ggpairs . In addition you can increase the figure size, this link might be useful : https://rstudio.github.io/dygraphs/r-markdown.html . yet another option is to use other representations of correlations matrixes: https://briatte.github.io/ggcorr/

- Also, the tick labels for some of the Univariate plot sections are hard to read. Consider adjusting the bin width so the tick labels are not on top of each other.

Also if you are interested in reading some more about how to choose the correct chart type:
http://blog.hubspot.com/marketing/data-visualization-choosing-chart

Requirements to exceed the specification ❯

# Final Plots and Summary ⌄

SPECIFICATION

The project includes a Final Plots and Summary section containing three plots and commentary. All plots in this section reflect what has been explored in the main body of the analysis.

✓ MEETS SPECIFICATION

SPECIFICATION

The plots are well chosen and the plots fulfill at least 2 of the criteria. The plots are varied and reveal interesting trends and relationships.
Given criteria:

- Draw comparisons.
- Identify trends.
- Engage a wide audience.
- Explain a complicated finding.
- Clarify a gap between perception and reality.
- Enable the reader to digest large amounts of information.

⭐ EXCEEDS SPECIFICATION

**Reviewer Comments**

Excellent choices for the final plots, very insightful.

Requirements to exceed the specification ❯

SPECIFICATION

All plots have appropriately selected variables and are plotted in a way that accurately conveys the data/information (i.e findings in Final Plot 1 do not depend on the findings of Final Plot 2).

✓ MEETS SPECIFICATION

SPECIFICATION

All plots are labeled appropriately (axis labels, plot titles, axis units) and can be read and interpreted easily. Plots are scaled appropriately.

🔄 DOES NOT MEET SPECIFICATION

**Reviewer Comments**

To pass this section please include labels and tittles for all of the final plots, labels should contain the unit of measurement of the variable(If applicable).

SPECIFICATION

The reasoning and findings from each plot are explained and the text about each plot is descriptive enough to stand alone. Comments reflect the contents of the plots that they are associated with.

🔄 DOES NOT MEET SPECIFICATION

**Reviewer Comments**

Final plot descriptions should contain rich statistics and numerical output, that not only supports the plots findings, but it provides further understanding of the data. The description should be able to stand on their own providing unique insights and concluding the analysis.

Please consider adding some extra lines of analysis to the final plot descriptions, it would be great to see statistics and numerical output that can further support the contents of each plot.

Also to give you a better understanding of what is expected for the final plot descriptions, consider answering questions like, why were these plots chosen as final plots? What key information can readers take away from the visualizations? What is your personal opinion or theories behind the relationships or trends found in the final plots?

**Final plot descriptions** Should be rich and provide in depth analysis of the data being depicted by the graph. It should answer questions previously stated in the analysis or even leave some open questions. Make sure the descriptions are at least the size of a small paragraph, not just one or two lines.

Requirements to exceed the specification ❯

## Reflection                                                                                          ⌄

SPECIFICATION

The project includes a Reflection section discussing the analysis performed.

✓ MEETS SPECIFICATION

SPECIFICATION

The section reflects on how the analysis was conducted and reports on the struggles and successes throughout the analysis. The section provides at least one idea or question for future work.

🔄 DOES NOT MEET SPECIFICATION

**Reviewer Comments**

A great summary of the analysis was drafted in the reflection, consider adding a personal opinion about the data, struggles and success that came up while conducting the analysis. Also it is recommended to add at least one idea or question about future work with the data.

More than one struggle and success should be discussed, document important decisions made while conducting the analysis.

Requirements to exceed the specification ❯

**Additional Reviewer Comments**
**Very good analysis**
I really enjoyed your analysis, it is well structured and provides very interesting relationships and trends. The effort and dedication put in is visible in every aspect of the current report There are but a few quick fixes in order to complete an amazing final report. Hope to see your next submission soon, keep up the good work.

I especially liked how the report explores many interesting relationships, using a wide variety of chart types including a correlation matrix and regression

lines. This was very creative and demonstrates a deep understanding of EDA concepts.

How satisfied are you with this feedback? ☆ ☆ ☆ ☆ ☆                    ☑ RESUBMIT PROJECT

⬇  Download project

🔄  Learn the best practices for revising and resubmitting your project.

❓  Have a question about your review? Email us at review-support@udacity.com and include the link to this review.