Car MPG Case Study

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**ABSTRACT (Subhead style 1: Arial, Size 12, Bold, ALL CAPS)**

Environment and consumer awareness are driving car OEMs to shift focus on increasing the miles per gallon offered by the vehicle. There are several factors which affect the MPG of a vehicle. The data collected is from the various sub systems of the car and have a lot of missing values. The missing values are caused by the devices, which transfer the data from the car into a human consumable format. The Paper studies the various options available for data imputation to increase the effectiveness of the MPG data analysis.

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**A note on tables and Figures**

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* Tables and figures must have titles and captions. See below for caption style.
* If you can write what is in a table within the text, write within the text. In other words, be judicious and sparing in your use of tables. Tables should be created from within Word, and not screen shots from SAS, Python or R. You can use the R functions to create tables from R output if you know how.
* Screen shots of graphics from SAS, R, and Python within the paper are acceptable.

**Introduction (Subhead style 1: Arial, Size 12, Bold, ALL CAPS)**

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Environmental concerns and consumer’s awareness are driving car OEMs to manufacture cars with better mpg (miles per Gallon). Vehicles mpg is drastically reduced in city drives where the driver has to encounter slower speed limits and multiple signal lights. The driver has to accelerate to gain momentum after every slow down or signal light. The MPGs in city drives are affected by driving styles and vehicle attributes. The data set provided has a lot of missing values, which affect the overall statistical capability of the data set. The objective of the study is to find affective ways of data imputation.

**Data Analysis**

|  |  |
| --- | --- |
| **Attribute Name** | **Characteristics** |
| Mpg | Miles Per gallon. This is the reading from the car during the drive |
| Cylinders | The number of cylinders in the car determines the mpg |
| Hp | Horse Power. The horse power generated by the engine |
| Weight | Weight of the car. A heavier car will need more displacement to gain momentum |
| Acceleration | Acceleration is a driving style. It depends on the pressure exerted by the driver on the accelerator gear |
| Weight | The Weight of the vehicle |
| Eng\_type | The Engine type , the type of engine could be a V4 or V6 |

Table 1 : Data attributes

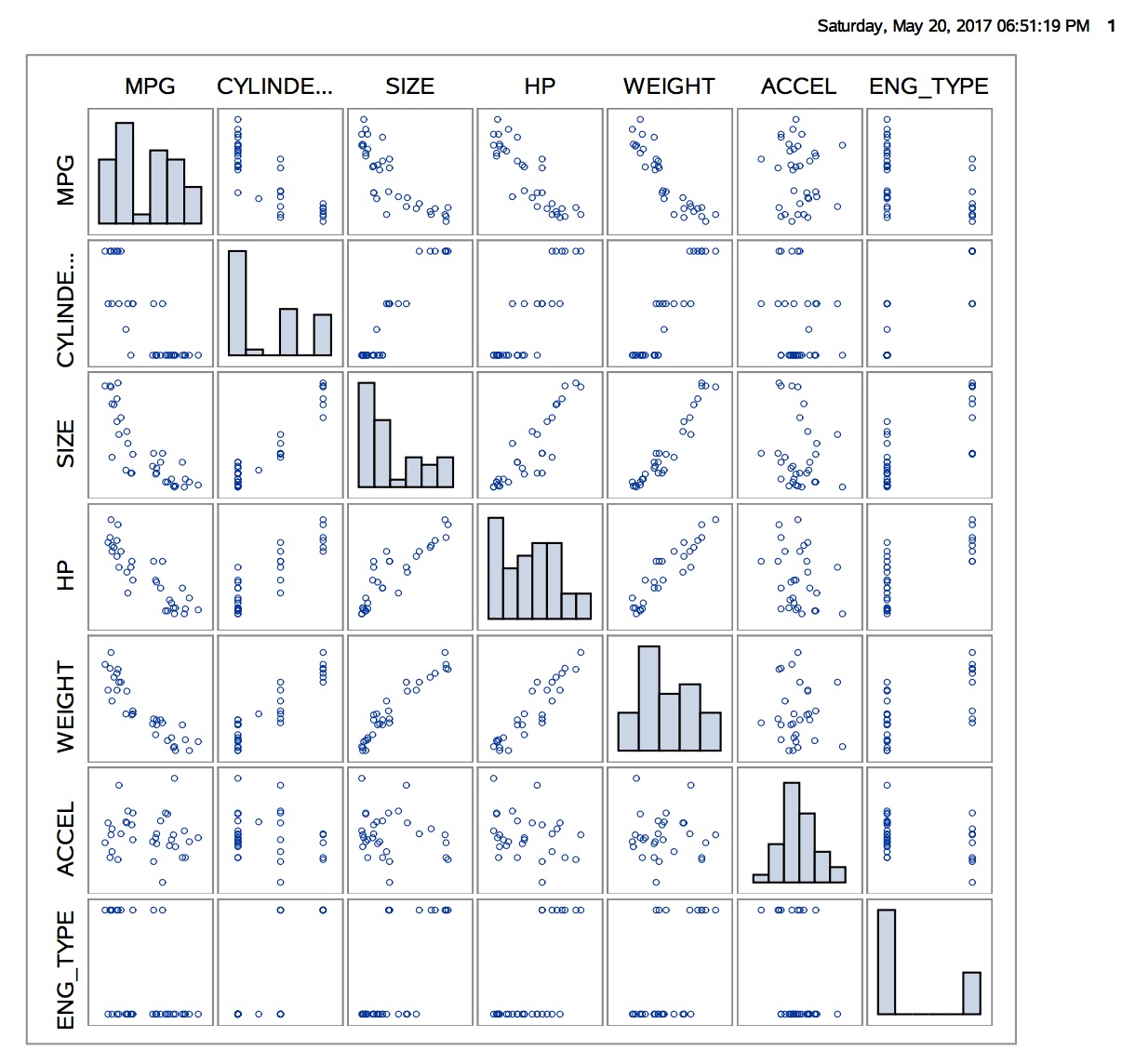


Figure : Scatter Plot

The section below comments a few relationships

|  |  |
| --- | --- |
| **Relationship** | **Comments** |
| Mpg-weight | The mpg decreases as the weight of the vehicle increases. |
| Hp-mpg | The mpg decreases as the vehicle offers higher Horsepower |
| Weight-hp | The horse power increases as the weight of the vehicle increases |

Table 2 : Data correlation

In this section, you want to describe the background of the project, including what others have done before you (in order to make what you are about to do possible). You should also give information on the software used (name of software, version, platform information, etc).

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**METHODS (SUBHEAD STYLE 1: Arial, Size 12, Bold, ALL CAPS)**

In this section, talk about the methods used to perform the analysis.

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**RESULTS (SUBHEAD STYLE 1: Arial, Size 12, Bold, ALL CAPS)**

In this section, describe the results from the analysis.

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**CONCLUSION (Subhead style 1: Arial, Size 12, Bold, ALL CAPS)**

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