# mileage

*by* Mileage Mileage

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The regression output to predict mileage is given below

**Descriptive Statistics**

| | Mean | Std. Deviation | N |
|---|---|---|---|
| Mileage | 24.6552 | 4.85781 | 58 |
| Weight | 2895.9483 | 502.90337 | 58 |
| Disp | 151.7241 | 54.96436 | 58 |
| Fuel | 4.2019 | .76916 | 58 |
| Small | .2241 | .42066 | 58 |
| Sporty | .1552 | .36523 | 58 |
| Compact | .2586 | .44170 | 58 |
| Medium | .1897 | .39545 | 58 |
| Large | .0517 | .22340 | 58 |

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| Model | R | | | | R Square Change | F Change | df1 | df2 | Sig. F Change | |
|---|---|---|---|---|---|---|---|---|---|---|
| 1 | .991[a] | .982 | .979 | .70869 | .982 | 328.654 | 8 | 49 | .000 | 2.056 |

| | | | | | |
|---|---|---|---|---|---|
| Regression | 1320.494 | 8 | 165.062 | 328.654 | .000[b] |
| Residual | 24.610 | 49 | .502 | | |
| Total | 1345.103 | 57 | | | |

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| Model | B | Std. Error | Beta | Lower Bound | Upper Bound |
|---|---|---|---|---|---|

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| 1 | (Constant) | 57.488 | 2.072 | | 27.750 | .000 | 53.325 | 61.651 |
| | Weight | -.001 | .001 | -.151 | -2.474 | .017 | -.003 | .000 |
| | Disp | .015 | .005 | .175 | 3.362 | .002 | .006 | .025 |
| | Fuel | -6.785 | .313 | -1.074 | -21.657 | .000 | -7.415 | -6.156 |
| | Small | -2.495 | .808 | -.216 | -3.087 | .003 | -4.119 | -.871 |
| | Sporty | -3.097 | .691 | -.233 | -4.481 | .000 | -4.485 | -1.708 |
| | Compact | -3.139 | .557 | -.285 | -5.637 | .000 | -4.258 | -2.020 |
| | Medium | -2.504 | .473 | -.204 | -5.292 | .000 | -3.455 | -1.553 |
| | Large | -2.412 | .732 | -.111 | -3.292 | .002 | -3.884 | -.940 |

a. Dependent Variable: Mileage

The regression equation is

Mileage = 57.49 –0.001 * weight + 0.015 * Displacement– 6.785 * Fuel – 2.495 * Small – 3.097 * Sporty – 3.139 * Compact – 2.504 * Medium – 2.412 * Large

The coefficient of determination is 0.982, indicating that 98.2% of the variation of Mileage is explained by the regression model

The model goodness of fit was validated using F test for overall significance. The p – value of f test statistic falls well below 0.05, indicating that the estimated regression model is good fit in predicting Mileage

2)

The regression output after ignoring the type is given below

| | | | |
|---|---|---|---|
| Mileage | 24.6552 | 4.85781 | 58 |
| Weight | 2895.9483 | 502.90337 | 58 |
| Disp | 151.7241 | 54.96436 | 58 |
| Fuel | 4.2019 | .76916 | 58 |

| | | | | | 4 Change Statistics | | | | |
|---|---|---|---|---|---|---|---|---|---|
| Model | R | R Square | Adjusted R Square | Std. Error of the Estimate | R Square Change | F Change | df1 | df2 | Sig. F Change | Durbin-Watson |
| 1 | .980[a] | .960 | .958 | .99422 | .960 | 435.596 | 3 | 54 | .000 | 1.205 |

| 5 Model | | Sum of Squares | df | Mean Square | F | Sig. |
|---|---|---|---|---|---|---|
| 1 | Regression | 1291.726 | 3 | 430.575 | 435.596 | .000[b] |
| | Residual | 53.378 | 54 | .988 | | |
| | Total | 1345.103 | 57 | | | |

| Model | | | | | | | | |
|---|---|---|---|---|---|---|---|---|
| 1 | (Constant) | 50.956 | .887 | | 57.460 | .000 | 49.178 | 52.734 |
| | Weight | .000 | .001 | -.032 | -.514 | .610 | -.002 | .001 |
| | Disp | .002 | .004 | .024 | .528 | .600 | -.006 | .010 |
| | Fuel | -6.121 | .338 | -.969 | -18.099 | .000 | -6.799 | -5.443 |

The regression equation is

Mileage = 50.956 – 0.000312 * weight + 0.002 * Displacement – 6.121 * Fuel

2 The coefficient of determination is 0.96, indicating that 96% of the variation of Mileage is explained by the regression model 2

The model goodness of fit was validated using 1 F test for overall significance. The p – value of f test statistic falls well below 0.05, indicating that the estimated regression model is good fit in predicting Mileage

3)

Model Checking procedures

The F test statistic is

$$F = \frac{\frac{RSS_1 - RSS_2}{K_2 - K_1}}{\frac{RSS_2}{n - K_2}} = \frac{\frac{53.378 - 24.61}{54 - 49}}{\frac{53.378}{58 - 54}} = 0.4312$$

Thus, the value of F test statistic is 0.4312 and its corresponding p – value is 0.81 > 0.05. Since the p –value is greater than 0.05, we conclude that the regression used to validate the F test seems to be identical

One of the important SAS procedure is "Upcase, lowcase, propcase"

Function: these functions are mainly used to convert the character value to any one of these three cases, namely upper case, lower case or procase. Procase was normally used to arrange the word in proper case with first letter of the word in capital letter and the remaining letters in small case

Example

```
Data newdata;
text1 = "I am INTERESTED in doing Maths"
text2 = upcase(text1);
text3 = lowcase(text1);
text4 = procase(text1);
Run;
```

# mileage

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