# [A fuel consumption study of Stata’s auto dataset](#a-fuel-consumption-study-of-statas-auto-dataset)

We conduct a study of the fuel consumption of cars in Stata’s auto dataset.

. sysuse auto, clear

(1978 Automobile Data)

## [Perform data transformation](#perform-data-transformation)

We generate a variable, **fuel**, that measures the fuel consumption rate in the unit of Gallons per 100 Miles.

. generate fuel = 100/mpg

. label variable fuel "Fuel consumption (Gallons per 100 Miles)"

Gallons per 100 Mile is a better measurement than Miles per Gallon. Going from a 10 Miles per Gallon car to a 20 Miles per Gallon car saves 5 Gallons per 100 Miles when Miles per Gallon increases 10. Going from a 20 Miles per Gallon car to a 40 Miles per Gallon car *only* saves 2.5 Gallons per 100 Miles when Miles per Gallon increases 20.

## [Examine the variables](#examine-the-variables)

We examine variables for possible errors in the data.

. describe fuel weight

storage display value

variable name type format label variable label

--------------------------------------------------------------------------------

fuel float %9.0g Fuel consumption (Gallons per 100

Miles)

weight int %8.0gc Weight (lbs.)

. summarize weight

Variable | Obs Mean Std. Dev. Min Max

-------------+---------------------------------------------------------

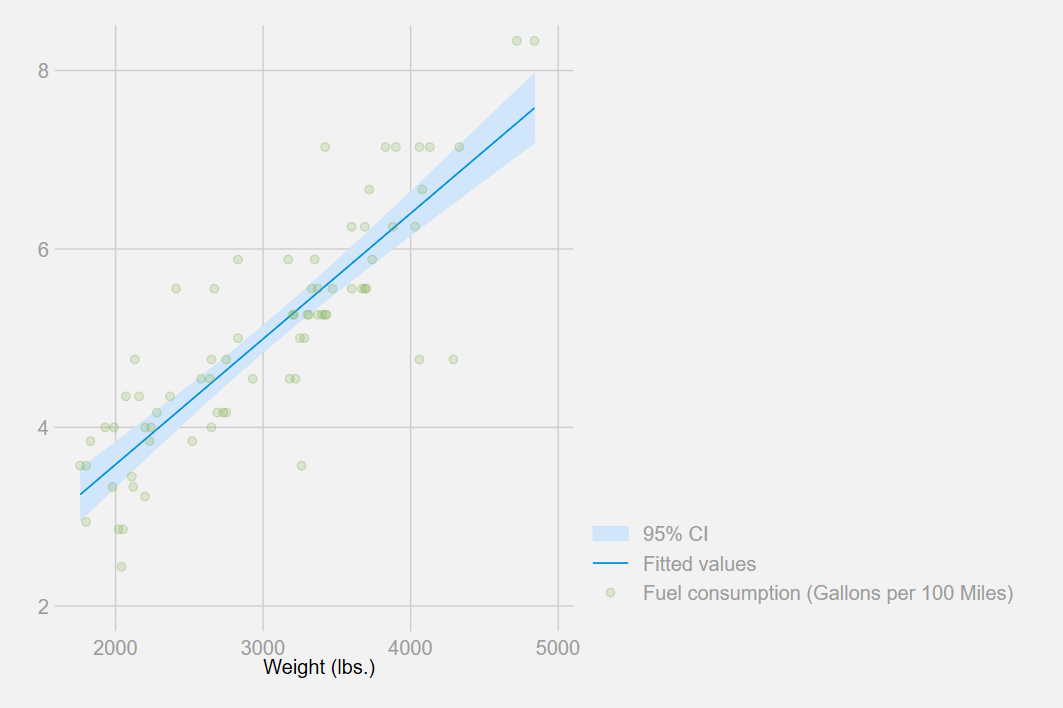
weight | 74 3019.459 777.1936 1760 4840

The variable **weight** has minimum value 1760.00, maximum value 4840.00, and range 3080.00.

## [Plot fuel consumption and vehicle weight](#plot-fuel-consumption-and-vehicle-weight)

The graph is produced with Daniel Bischof’s *538* scheme.

. twoway lfitci fuel weight || scatter fuel weight, mcolor(%20) scheme(538)



## [Explore relationship between fuel consumption and vehicle weight - linear regression](#explore-relationship-between-fuel-consumption-and-vehicle-weight-linear-regression)

. regress fuel weight

Source | SS df MS Number of obs = 74

-------------+---------------------------------- F(1, 72) = 194.71

Model | 87.2964969 1 87.2964969 Prob > F = 0.0000

Residual | 32.2797639 72 .448330054 R-squared = 0.7300

-------------+---------------------------------- Adj R-squared = 0.7263

Total | 119.576261 73 1.63803097 Root MSE = .66957

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fuel | Coef. Std. Err. t P>|t| [95% Conf. Interval]

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weight | .001407 .0001008 13.95 0.000 .001206 .0016081

\_cons | .7707669 .3142571 2.45 0.017 .1443069 1.397227

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The regression shows that for every unit increase in weight, a 0.0014 unit increase in fuel consumption is predicted.

## [Produce an HTML table from regression results](#produce-an-html-table-from-regression-results)

. \_coef\_table, markdown

| **fuel** | **Coef.** | **Std. Err.** | **t** | **P>|t|** | **[95% Conf. Interval]** | |
| --- | --- | --- | --- | --- | --- | --- |
| weight | .001407 | .0001008 | 13.95 | 0.000 | .001206 | .0016081 |
| \_cons | .7707669 | .3142571 | 2.45 | 0.017 | .1443069 | 1.397227 |

## [Produce a table from **estimates table**](#produce-a-table-from-estimates-table)

. quietly regress fuel weight gear turn

. estimates store model1

. quietly regress fuel weight gear turn foreign

. estimates store model2

. estimates table model1 model2, varlabel b(%7.4f) stats(N r2\_a) star markdown

| **Variable** | **model1** | **model2** |
| --- | --- | --- |
| Weight (lbs.) | 0.0014\*\*\* | 0.0013\*\*\* |
| Gear Ratio | 0.1706 | -0.3367 |
| Turn Circle (ft.) | 0.0243 | 0.0613 |
| Car type |  | 0.8650\*\*\* |
| Constant | -0.5814 | -0.4661 |
| N | 74 | 74 |
| r2\_a | 0.7218 | 0.7637 |

legend: \* p<0.05; \*\* p<0.01; \*\*\* p<0.001

## [References](#references)

1. [Convert dynamic Markdown documents to Word or HTML](https://www.stata.com/features/overview/markdown/)
2. [dyndoc manual](https://www.stata.com/manuals/rptdyndoc.pdf)
3. [dynamic tags manual (Stata 16)](https://www.stata.com/manuals/rptdynamictags.pdf#rptDynamictags)
4. [scheme 538](https://danbischof.com/2017/09/05/a-final-stata-gift-538-schemes/)
5. [markdown reference](https://daringfireball.net/projects/markdown/syntax)