Peer graded assignment regression models

yinshu zhang

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Introduction

This study if conducted by Motor Trend magazine to explore the relationship between a set of variables and the fuel consumption. The focus of this paper is to address two questions.

> "Is an automatic or manual transmission better for MPG"
>
> "Quantify the MPG difference between automatic and manual transmissions"

Data Exploration

```
dim.mtcars <- dim(mtcars)
```

We will use "mtcars" data to draw conclusions, mtcars is a 32 by 11 data frame, with columns defined as:

column name	defination
mpg	miles per gallon(US)
cyl	number of cylinders
disp	engine displacement(cu. in.)
hp	Gross horsepower
drat	Rear axle ratio
wt	Weight (1000 lbs)
qsec	zero to 1/4 mile time in seconds
vs	Engine shape (0 = V-shaped, 1 = straight)
am	Transmission (0 = automatic, 1 = manual)
gear	Number of forward gears
carb	Number of carburetors

A quick look at each variables

```
## Loading required package: ggplot2
```

MPG ANOVA test against AM

To answer first question, is automatic or manula transmission better or worse for MPG. We will use null hyposis that MPG is the same between auto and manual.

```
anova1 <- aov(mpg ~ am, data = mtcars)
summary(anova1)
```

```
##              Df Sum Sq Mean Sq F value   Pr(>F)
## am            1  405.2   405.2   16.86 0.000285 ***
## Residuals    30  720.9    24.0
## ---
```

```
## Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

the result shows strong evident rejecting H0

Regression

Executive Summary