

# Sheth L.U.J. And Sir M.V. College

## Performing two-way ANOVA using aov() (R). Output:-

The screenshot shows the RStudio interface with the console tab active. The code entered is:

```
> cars_data <- read.csv("cars.csv")
> str(cars_data)
'data.frame': 38531 obs. of 30 variables:
 $ manufacturer_name: chr "Subaru" "Subaru" "Subaru" "Subaru" ...
 $ model_name       : chr "Outback" "Outback" "Forester" "Impreza" ...
 $ transmission     : chr "automatic" "automatic" "automatic" "mechanical" ...
 $ color            : chr "silver" "blue" "red" "blue" ...
 $ odometer_value   : int 190000 290000 402000 10000 280000 132449 318280 350000
179000 571317 ...
$ year_produced    : int 2010 2002 2001 1999 2001 2011 1998 2004 2010 1999 ...
$ engine_fuel      : chr "gasoline" "gasoline" "gasoline" "gasoline" ...
$ engine_has_gas   : chr "False" "False" "False" "False" ...
$ engine_type      : chr "gasoline" "gasoline" "gasoline" "gasoline" ...
$ engine_capacity  : num 2.5 3 2.5 3 2.5 2.5 2.5 2.5 2.5 2.5 ...
$ body_type         : chr "universal" "universal" "suv" "sedan" ...
$ has_warranty     : chr "False" "False" "False" "False" ...
$ state             : chr "owned" "owned" "owned" "owned" ...
$ drivetrain        : chr "all" "all" "all" "all" ...
$ price_usd        : num 10900 5000 2800 9999 2134 ...
$ is_exchangeable   : chr "False" "True" "True" "True" ...
$ location_region  : chr "Минская обл." "Минская обл." "Минская обл." "Минская обл."
...
$ number_of_photos : int 9 12 4 9 14 20 8 7 17 8 ...
$ up_counter        : int 13 54 72 42 7 56 147 29 33 11 ...
$ feature_0         : chr "False" "False" "False" "True" ...
$ feature_1         : chr "True" "True" "True" "False" ...
$ feature_2         : chr "True" "False" "False" "False" ...
$ feature_3         : chr "True" "False" "False" "False" ...
$ feature_4         : chr "False" "True" "False" "False" ...
$ feature_5         : chr "True" "False" "False" "False" ...
$ feature_6         : chr "False" "False" "False" "False" ...
$ feature_7         : chr "True" "False" "False" "False" ...
$ feature_8         : chr "True" "False" "True" "False" ...
$ feature_9         : chr "True" "True" "True" "False" ...
$ duration_listed  : int 16 83 151 81 7 67 307 73 87 43 ...
> cars_data$cyl <- as.factor(cars_data$cyl)
```

The environment pane shows various datasets loaded, including anova\_model, bats\_information, boston, cars\_data, clean\_exact, combined\_data, and cyl\_pivot. The files pane lists several CSV files and scripts.

The screenshot shows the RStudio interface with the console tab active. The code entered continues from the previous screenshot:

```
> cars_data$cyl <- as.factor(cars_data$cyl)

>Error in '$<-data.frame`(*tmp*, cyl, value = integer(0))' :
replacement has 0 rows, data has 38531

> cars_data$gear <- as.factor(cars_data$gear)

>Error in '$<-data.frame`(*tmp*, gear, value = integer(0))' :
replacement has 0 rows, data has 38531

> anova_model <- aov(mpg ~ cyl * gear, data = cars_data)
>Error in eval(predvars, data, env) : object 'mpg' not found

> summary(anova_model)
Df Sum Sq Mean Sq F value Pr(>F)
gender     1    179   178.92   4.669 0.0311 *
Residuals 581  22626    38.32
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
>
>
```

The environment pane shows the same datasets as the previous screenshot. The files pane lists the same CSV files and scripts.

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