MULTIPLE LINEAR REGRESSION
ShinyApp.io

EXPLORING THE DEPTHS:

User Guide and In-depth Analysis of Multiple Linear Regression Application on ShinyApp.io

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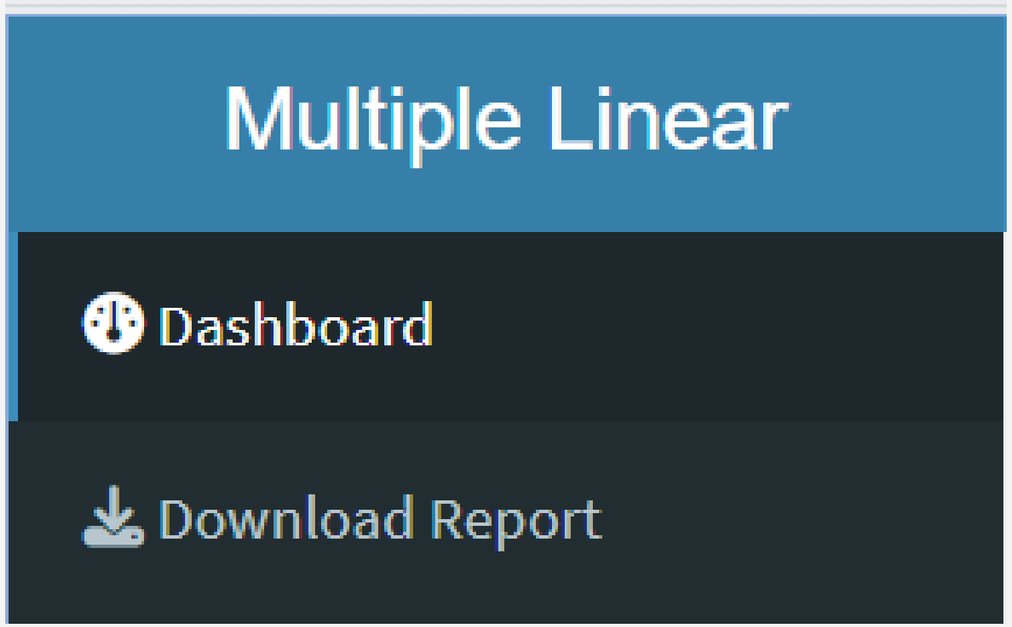
TABLE OF CONTENTS

INTRODUCTION



The provided R Shiny code creates a dashboard for Multiple Linear Regression analysis using user-provided data. Below is a guidebook explaining different sections of the code and their functionalities:

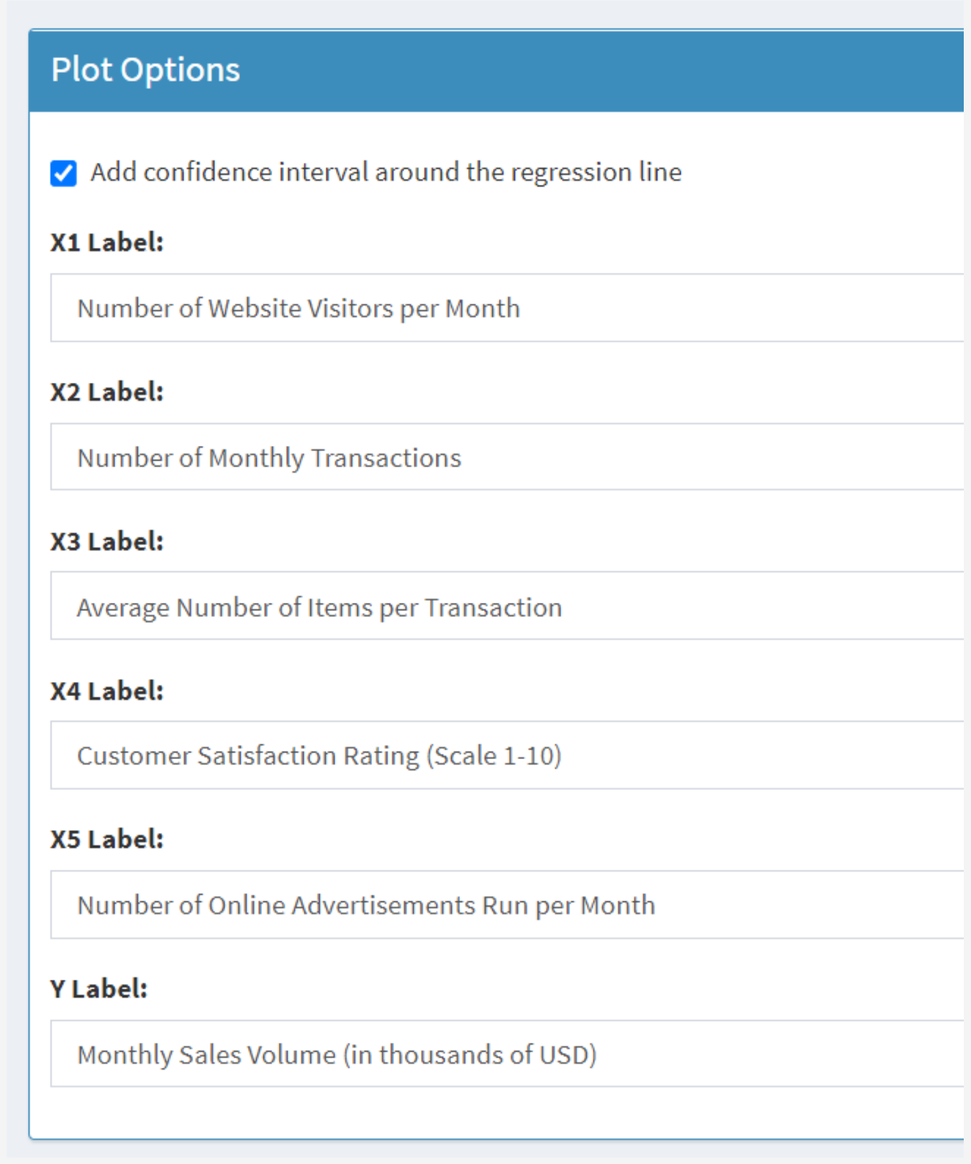
Dashboard Structure:

- The dashboard is divided into two tabs: "Dashboard" and "Download Report."
- The "Dashboard" tab contains several boxes, each serving a specific purpose related to the Multiple Linear Regression analysis.
- The "Download Report" tab includes options to download the generated report.

This Shiny application is designed to facilitate the analysis of multiple linear regression models. Users can explore relationships between multiple independent variables (X1, X2, X3, X4, X5) and a dependent variable (y), representing monthly sales volume in thousands of USD. The dashboard provides several features to assist users in understanding and interpreting the regression model.

PLOT OPTIONS

In this section, users will find details on how to customize the regression plot using various options. It explains the significance of adding confidence intervals around the regression line and how users can label each variable to enhance the interpretability of the plot.



Showing 1 to 10 of 12 entries

$\bar{X1} = 205000$
$\bar{X2} = 11333.333$
$\bar{X3} = 5$
$\bar{X4} = 8.667$
$\bar{X5} = 33750$
$\bar{y} = 206.25$
$n = 12$

DATA SUMMARY

Displays a summary of the input data, including mean values for each variable, the mean of the dependent variable (y), and the sample size (n).

Data Summary

Copy CSV Excel PDF Print Search:

	X1	X2	X3	X4	X5	y
1	150000	8000	5	8.5	20000	120
2	160000	9500	4.5	8.2	22000	150
3	170000	10000	4.8	8.4	25000	160
4	180000	10500	4.6	8.5	23000	165
5	190000	11000	5.1	8.6	30000	180
6	200000	9000	4.7	8.7	28000	170
7	210000	11500	4.9	8.8	27000	190
8	220000	12000	5	8.9	35000	210
9	230000	12500	5.2	8.7	40000	230
10	240000	13000	5.3	8.8	45000	250

Showing 1 to 10 of 12 entries Previous 1 2 Next

REGRESSION PARAMETERS

Here, users will find instructions on interpreting the regression parameters. It covers coefficients, standard errors, t-values, and p-values for each predictor variable. This section helps users understand the statistical aspects of the regression model.

Regression Parameters

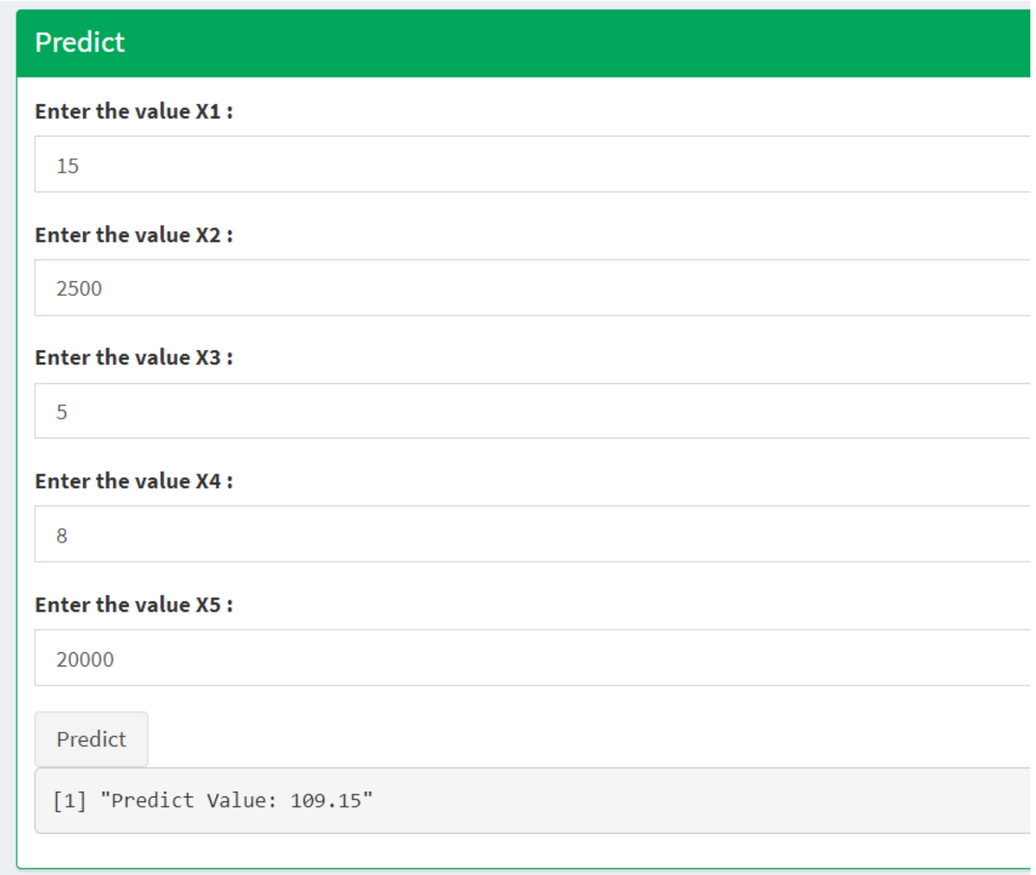
```
Call:
lm(formula = y ~ X1 + X2 + X3 + X4 + X5, data = data)

Residuals:
     Min       1Q   Median       3Q      Max
-12.6728  -2.1612   0.5324   2.1826   9.9256

Coefficients:
              Estimate Std. Error t value Pr(>|t|)
(Intercept) -1.382e+02  1.992e+02  -0.694  0.51371
X1          -4.914e-04  3.765e-04  -1.305  0.23961
X2           1.112e-02  4.129e-03   2.694  0.03584 *
X3          -4.469e+01  1.990e+01  -2.246  0.06583 .
X4           4.241e+01  3.086e+01   1.374  0.21844
X5           5.185e-03  8.787e-04   5.900  0.00105 **
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 8.562 on 6 degrees of freedom
Multiple R-squared:  0.991,     Adjusted R-squared:  0.9834
F-statistic: 131.6 on 5 and 6 DF,  p-value: 4.797e-06
```

From the output, the significant variables are X2 and X5.

PREDICT

This section guides users on how to make predictions using the regression model. It explains the input requirements, such as entering values for X1 to X5, and provides information on interpreting the predicted sales volume.

click the "Predict" button to obtain the predicted sales volume based on the regression model.



PREDICTED SALES VOLUME

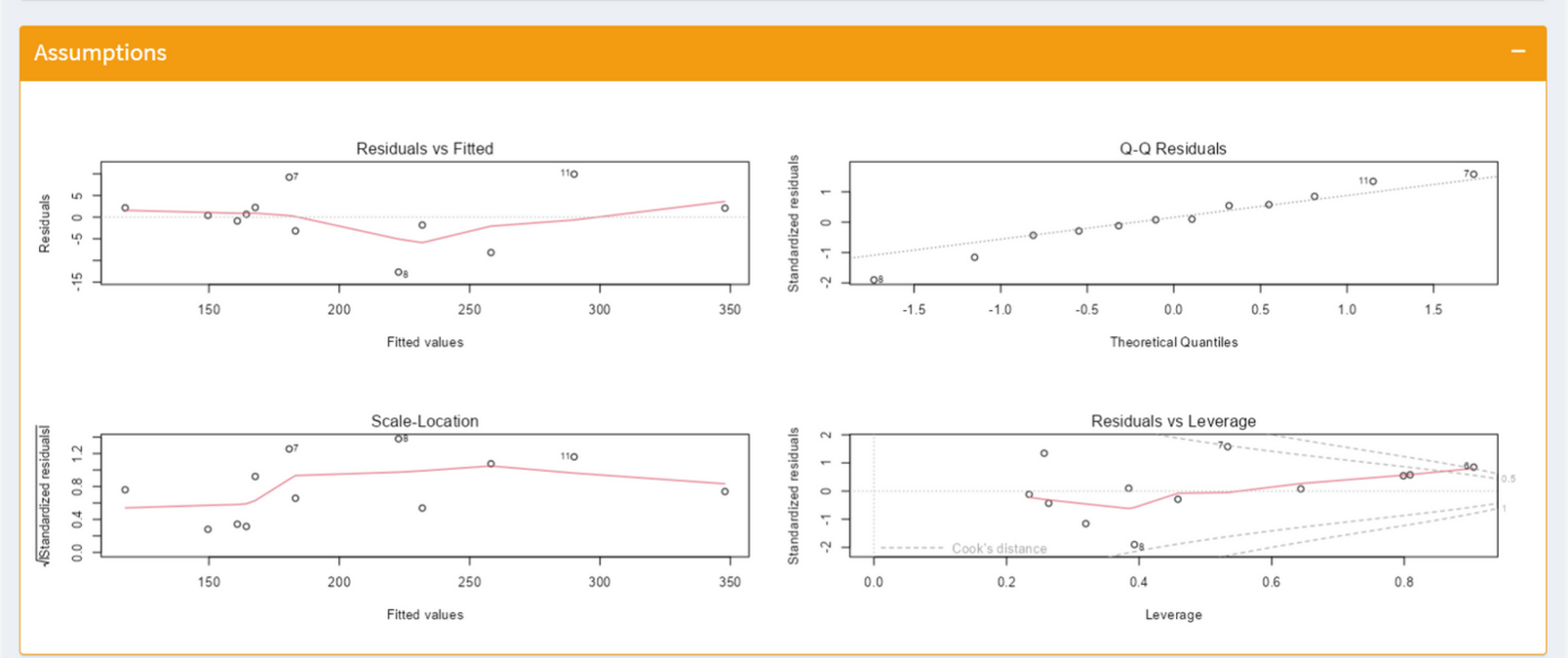
Users can input X1, X2, X3, X4 and X5 to predict sales. For

Example,if there are 15 website visitors per month, 2500 monthly transactions, 5 items per transaction, 8 customer satifaction rating and 20000 online advertisements per month. The sales are 109.15 thousand USD.

ASSUMPTIONS

Users will learn how to assess the assumptions of multiple linear regression through diagnostic plots.

The section covers the interpretation of plots, such as residuals vs. fitted values, normal Q-Q plots, and scale-location plots.



Interaction ANOVA

```
            Df Sum Sq Mean Sq F value   Pr(>F)
X1           1  42750   42750 392.215  4.4e-08 ***
X5           1   4657    4657  42.730 0.000181 ***
X1:X5        1    377     377   3.458 0.100016
Residuals    8    872     109
---
Signif. codes:  0 ‘***’ 0.001 ‘**’ 0.01 ‘*’ 0.05 ‘.’ 0.1 ‘ ’ 1
```

This part explains the interaction ANOVA, focusing on the analysis of variance to assess interaction effects between specific variables. Users will understand the output and implications for the model.

INTERACTION ANOVA

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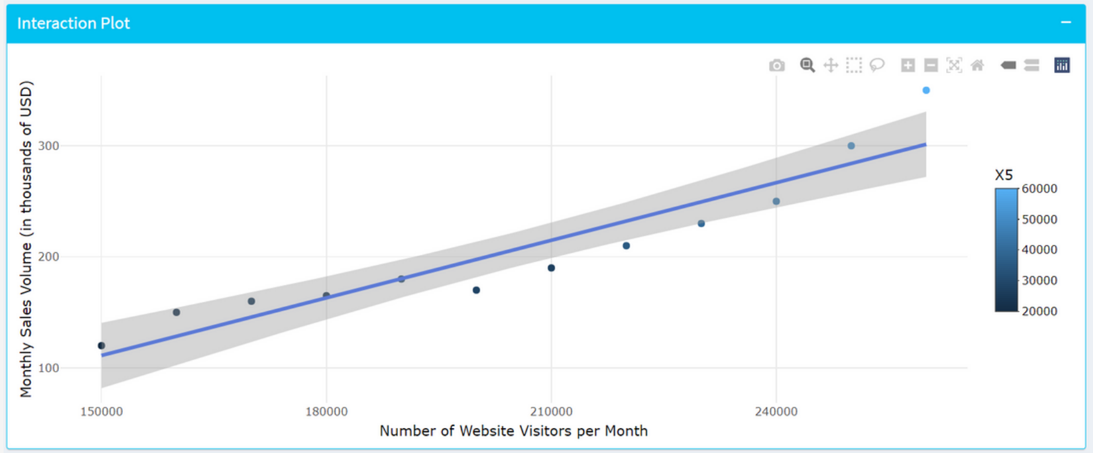
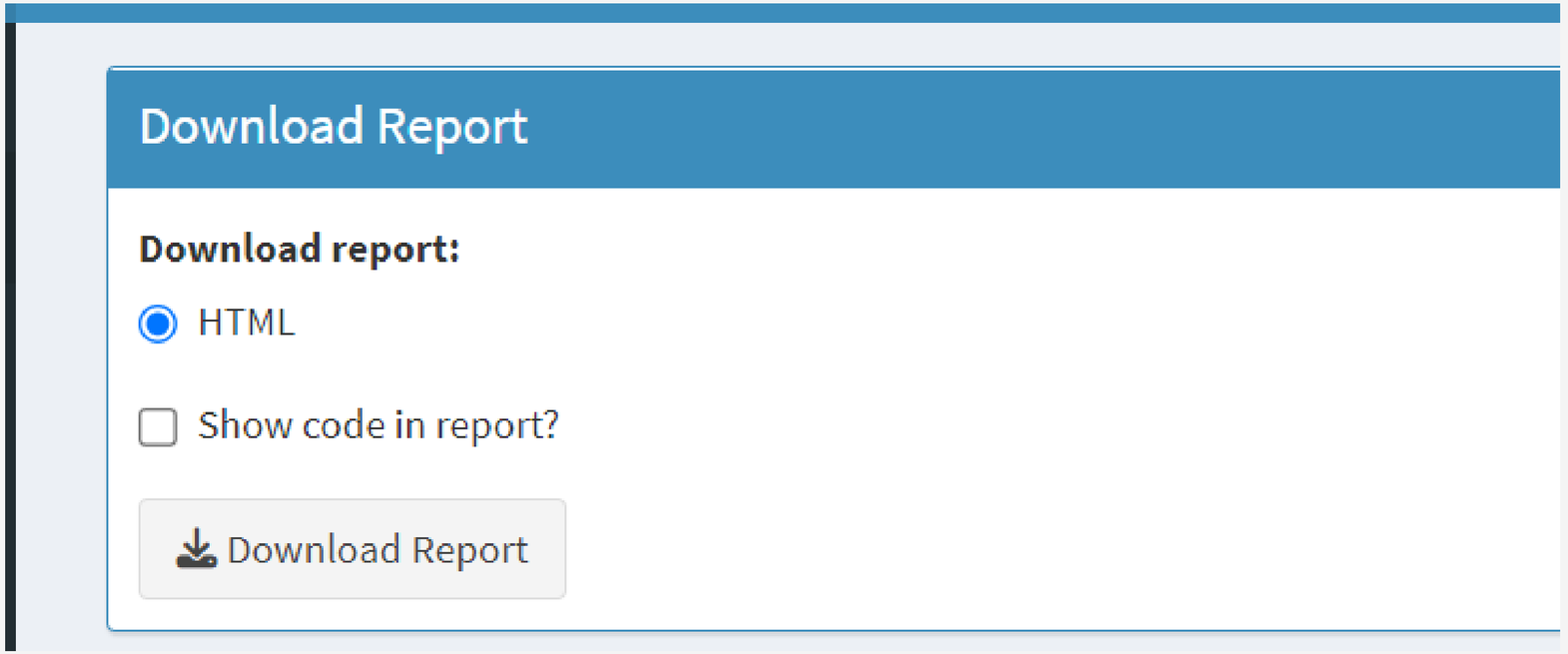
Users are guided on how to interact with the plot depicting the relationship between X1, y, and color-coded by X5. The section explains the toggle option for confidence intervals and enhances user experience in exploring the data.



DOWNLOAD REPORT

This section provides step-by-step instructions on how users can download a report summarizing the analysis in HTML format. Users can choose whether to include code in the report, making it a flexible tool for documentation.



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RHINY DASHBOARD

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