How can I extract regression coefficients from the glm() function in R?

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The glm() function in R is used to fit generalized linear models, which are commonly used for regression analysis. In order to extract regression coefficients from the glm() function, users can utilize the coef() function, which will return a vector containing the estimated coefficients for each variable in the model. The coefficients represent the relationships between the independent variables and the dependent variable in the model. By extracting and examining these coefficients, users can gain insights into the strength and direction of these relationships, and use them to make predictions and interpret the results of their regression analysis.

Extract Regression Coefficients from glm() in R

You can use the following methods to extract regression coefficients from the glm() function in R:

Method 1: Extract All Regression Coefficients

model$coefficients

Method 2: Extract Regression Coefficient for Specific Variable

model$coefficients

Method 3: Extract All Regression Coefficients with Standard Error, Z Value & P-Value

summary(model)$coefficients

The following example shows how to use these

methods in practice.

Example: Extract Regression Coefficients from glm() in R

Suppose we fit a using the Default dataset from the ISLR package:

```
#load dataset
data <- ISLR::Default

#view first six rows of data
head(data)

default student balance income
1 No No 729.5265 44361.625
2 No Yes 817.1804 12106.135
3 No No 1073.5492 31767.139
4 No No 529.2506 35704.494
5 No No 785.6559 38463.496
6 No Yes 919.5885 7491.559

#fit logistic regression model
model <- glm(default~student+balance+income, family='binomial', data=data)

#view summary of logistic regression model
```

```
summary(model)

Call:
glm(formula = default ~ student + balance + income,
family = "binomial",
data = data)

Deviance Residuals:
Min 1Q Median 3Q Max
-2.4691 -0.1418 -0.0557 -0.0203 3.7383

Coefficients:
Estimate Std. Error z value Pr(>|z|)
(Intercept) -1.087e+01 4.923e-01 -22.080 < 2e-16 ***
studentYes -6.468e-01 2.363e-01 -2.738 0.00619 **
balance 5.737e-03 2.319e-04 24.738 < 2e-16 ***
income 3.033e-06 8.203e-06 0.370 0.71152
---
Signif. codes: 0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1

(Dispersion parameter for binomial family taken to be 1)

Null deviance: 2920.6 on 9999 degrees of freedom
Residual deviance: 1571.5 on 9996 degrees of freedom
AIC: 1579.5
```

Number of Fisher Scoring iterations: 8

We can type model$coefficients to extract all of the regression coefficients in the model:

#extract all regression coefficients
model$coefficients

(Intercept) studentYes balance income
-1.086905e+01 -6.467758e-01 5.736505e-03 3.033450e-06

We can also type model$coefficients to extract the regression coefficient for the balance variable only:

#extract coefficient for 'balance'
model$coefficients

balance
0.005736505

To view the regression coefficients along with their standard errors, z values and , we can use summary(model)$coefficients as follows:

#view regression coefficients with standard errors, z

values and p-values
summary(model)$coefficients

Estimate Std. Error z value Pr(>|z|)
(Intercept) -1.086905e+01 4.922555e-01 -22.080088 4.911280e-108
studentYes -6.467758e-01 2.362525e-01 -2.737646 6.188063e-03
balance 5.736505e-03 2.318945e-04 24.737563 4.219578e-135
income 3.033450e-06 8.202615e-06 0.369815 7.115203e-01

For example, we can use the following code to access the p-value for the balance variable:

#view p-value for balance variable
summary(model)$coefficients

4.219578e-135

Or we could use the following code to access the p-value for each of the regression coefficients:

#view p-value for all variables

summary(model)$coefficients

(Intercept) studentYes balance income
4.911280e-108 6.188063e-03 4.219578e-135 7.115203e-01

The p-values are shown for each regression coefficient in the model.

You can use similar syntax to access any of the values in the output.