

## **Experiment-9**

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## 1. Aim:

Study of Regression analysis using R programming.

## 2. Code:

```
# Generate random IQ values with mean = 30 and sd =2
IQ <- rnorm(40, 30, 2)
# Sorting IQ level in ascending order
IQ <- sort(IQ)
# Generate vector with pass and fail values of 40 students
result <- c(0, 0, 0, 1, 0, 0, 0, 0, 0, 1,
       1, 0, 0, 0, 1, 1, 0, 0, 1, 0,
       0, 0, 1, 0, 0, 1, 1, 0, 1, 1,
       1, 1, 1, 0, 1, 1, 1, 1, 0, 1)
# Data Frame
df <- as.data.frame(cbind(IQ, result))</pre>
# Print data frame
print(df)
# output to be present as PNG file
png(file="LogisticRegressionGFG.png")
# Plotting IQ on x-axis and result on y-axis
plot(IQ, result, xlab = "IQ Level",
  ylab = "Probability of Passing")
# Create a logistic model
g = glm(result~IQ, family=binomial, df)
# Create a curve based on prediction using the regression model
curve(predict(g, data.frame(IQ=x), type="resp"), add=TRUE)
# This Draws a set of points
```

# Based on fit to the regression model

points(IQ, fitted(g), pch=30)

# Summary of the regression model summary(g)

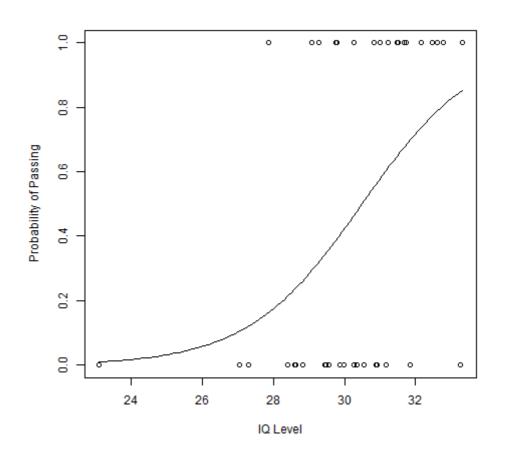
# saving the file dev.off()

## 3. Output:

```
R 4.2.2 · ~/ ≈
> # Print data frame
> print(df)
         IQ result
1
   23.10025
                  0
2
  27.05939
                  0
3
                  0
  27.29954
  27.87923
                  1
5
  28.41489
                  0
  28.59236
                  0
   28.62341
                  0
8
   28.81856
                  0
  28.81960
                  0
10 29.08283
                  1
11 29.27453
                  1
12 29.44096
                  0
13 29.48619
                  0
14 29.56063
                  0
15 29.75420
                  1
16 29.79161
                  1
                  0
17 29.87952
18 29.98405
                  0
19 30.25294
                  1
20 30.27315
                  0
21 30.36266
                  0
22 30.54369
                  0
23 30.83768
                  1
                  0
24 30.88493
25 30.92775
                  0
26 30.99528
                  1
27 30.99997
                  1
28 31.17391
                  0
29 31.22656
                  1
30 31.47640
                  1
31 31.49490
                  1
32 31.67155
                  1
22 21 7/1722
```

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```
> summary(g)
Call:
glm(formula = result ~ IQ, family = binomial, data = df)
Deviance Residuals:
    Min
             1Q
                 Median
                               3Q
                                       Max
-1.9431 -0.9614
                -0.3063 0.9462
                                    1.9019
Coefficients:
           Estimate Std. Error z value Pr(>|z|)
                    7.7938 -2.437 0.0148
(Intercept) -18.9955
             0.6229
                       0.2559 2.434
(Intercept) *
ΙQ
Signif. codes:
0 '*** 0.001 '** 0.01 '* 0.05 '. ' 0.1 ' ' 1
(Dispersion parameter for binomial family taken to be 1)
    Null deviance: 55.352 on 39 degrees of freedom
Residual deviance: 46.957 on 38 degrees of freedom
AIC: 50.957
```



Number of Fisher Scoring iterations: 4