Calories Consumed- Output

> summary(Calories\_consumed)

Weight.gained..grams. Calories.Consumed

Min. : 62.0 Min. :1400

1st Qu.: 114.5 1st Qu.:1728

Median : 200.0 Median :2250

Mean : 357.7 Mean :2341

3rd Qu.: 537.5 3rd Qu.:2775

Max. :1100.0 Max. :3900

> sum(is.na(Calories\_consumed))

[1] 0

> #Correlation Coefficient (r)

[1] 0.946991

# Simple Linear Regression model

> summary(reg)

Call:

lm(formula = Calories\_consumed$Weight.gained..grams. ~ Calories\_consumed$Calories.Consumed)

Residuals:

Min 1Q Median 3Q Max

-158.67 -107.56 36.70 81.68 165.53

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) -625.75236 100.82293 -6.206 4.54e-05 \*\*\*

Calories\_consumed$Calories.Consumed 0.42016 0.04115 10.211 2.86e-07 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 111.6 on 12 degrees of freedom

**Multiple R-squared: 0.8968**, Adjusted R-squared: 0.8882

F-statistic: 104.3 on 1 and 12 DF, p-value: 2.856e-07

> sum(reg$residuals)

[1] 6.750156e-14

> mean(reg$residuals)

[1] 4.822036e-15

**> sqrt(sum(reg$residuals^2)/nrow(Calories\_consumed)) #RMSE**

**[1] 103.3025**

> sqrt(mean(reg$residuals^2))

[1] 103.3025

# Logarithmic Model

> cor(log(Calories\_consumed$Calories.Consumed), Calories\_consumed$Weight.gained..grams.)

[1] 0.8987253

> summary(reg\_log)

Call:

lm(formula = Calories\_consumed$Weight.gained..grams. ~ log(Calories\_consumed$Calories.Consumed))

Residuals:

Min 1Q Median 3Q Max

-187.44 -142.96 23.13 113.20 213.82

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) -6955.7 1030.9 -6.747 2.05e-05 \*\*\*

log(Calories\_consumed$Calories.Consumed) 948.4 133.6 7.100 1.25e-05 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 152.3 on 12 degrees of freedom

**Multiple R-squared: 0.8077,** Adjusted R-squared: 0.**7917**

F-statistic: 50.4 on 1 and 12 DF, p-value: 1.248e-05

|  |
| --- |
| **> sqrt(sum(reg\_log$residuals^2)/nrow(Calories\_consumed)) #RMSE**  **[1] 141.0054** |
|  |
| |  | | --- | | **# Exponential Model** | |

> summary(reg\_exp)

Call:

lm(formula = log(Calories\_consumed$Weight.gained..grams.) ~ Calories\_consumed$Calories.Consumed)

Residuals:

Min 1Q Median 3Q Max

-0.86537 -0.10532 0.02462 0.13467 0.42632

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 2.8386724 0.2994581 9.479 6.36e-07 \*\*\*

Calories\_consumed$Calories.Consumed 0.0011336 0.0001222 9.276 8.02e-07 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.3314 on 12 degrees of freedom

**Multiple R-squared: 0.8776**, Adjusted R-squared: 0.8674

F-statistic: 86.04 on 1 and 12 DF, p-value: 8.018e-07

**> sqrt(sum(error^2)/nrow(Calories\_consumed)) #RMSE**

**[1] 118.0452**

**Delivery Time Output**

|  |
| --- |
| > summary(Delivery\_time)  Delivery.Time Sorting.Time  Min. : 8.00 Min. : 2.00  1st Qu.:13.50 1st Qu.: 4.00  Median :17.83 Median : 6.00  Mean :16.79 Mean : 6.19  3rd Qu.:19.75 3rd Qu.: 8.00  Max. :29.00 Max. :10.00  # Simple Linear Regression model  > summary(reg)  Call:  lm(formula = Delivery\_time$Delivery.Time ~ Delivery\_time$Sorting.Time)  Residuals:  Min 1Q Median 3Q Max  -5.1729 -2.0298 -0.0298 0.8741 6.6722  Coefficients:  Estimate Std. Error t value Pr(>|t|)  (Intercept) 6.5827 1.7217 3.823 0.00115 \*\*  Delivery\_time$Sorting.Time 1.6490 0.2582 6.387 3.98e-06 \*\*\*  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1  Residual standard error: 2.935 on 19 degrees of freedom  **Multiple R-squared: 0.6823**, Adjusted R-squared: 0.6655  F-statistic: 40.8 on 1 and 19 DF, p-value: 3.983e-06  **> sqrt(sum(reg$residuals^2)/nrow(Delivery\_time)) #RMSE**  **[1] 2.79165**  **# Logarithmic Model**  summary(reg\_log)  Call:  lm(formula = Delivery\_time$Delivery.Time ~ log(Delivery\_time$Sorting.Time))  Residuals:  Min 1Q Median 3Q Max  -4.0829 -2.0133 -0.1965 0.9351 7.0171  Coefficients:  Estimate Std. Error t value Pr(>|t|)  (Intercept) 1.160 2.455 0.472 0.642  log(Delivery\_time$Sorting.Time) 9.043 1.373 6.587 2.64e-06 \*\*\*  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1  Residual standard error: 2.873 on 19 degrees of freedom  **Multiple R-squared: 0.6954**, Adjusted R-squared: 0.6794  F-statistic: 43.39 on 1 and 19 DF, p-value: 2.642e-06  **> sqrt(sum(reg\_log$residuals^2)/nrow(Delivery\_time)) #RMSE**  **[1] 2.733171**  **# Exponential Mode**  summary(reg\_exp)  Call:  lm(formula = log(Delivery\_time$Delivery.Time) ~ Delivery\_time$Sorting.Time)  Residuals:  Min 1Q Median 3Q Max  -0.29209 -0.13364 0.02065 0.08421 0.41892  Coefficients:  Estimate Std. Error t value Pr(>|t|)  (Intercept) 2.12137 0.10297 20.601 1.86e-14 \*\*\*  Delivery\_time$Sorting.Time 0.10555 0.01544 6.836 1.59e-06 \*\*\*  ---  Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1  Residual standard error: 0.1755 on 19 degrees of freedom  **Multiple R-squared: 0.7109**, Adjusted R-squared: 0.6957  F-statistic: 46.73 on 1 and 19 DF, p-value: 1.593e-06  **> sqrt(sum(error^2)/nrow(Delivery\_time)) #RMSE**  **[1] 2.94025** |
|  |
|  |

**Emp\_data Output**

> summary(Emp\_data)

Salary\_hike Churn\_out\_rate

Min. :1580 Min. :60.00

1st Qu.:1618 1st Qu.:65.75

Median :1675 Median :71.00

Mean :1689 Mean :72.90

3rd Qu.:1724 3rd Qu.:78.75

Max. :1870 Max. :92.00

**# Simple Linear Regression model**

summary(reg)

Call:

lm(formula = Emp\_data$Churn\_out\_rate ~ Emp\_data$Salary\_hike)

Residuals:

Min 1Q Median 3Q Max

-3.804 -3.059 -1.819 2.430 8.072

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 244.36491 27.35194 8.934 1.96e-05 \*\*\*

Emp\_data$Salary\_hike -0.10154 0.01618 -6.277 0.000239 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.469 on 8 degrees of freedom

**Multiple R-squared: 0.8312**, Adjusted R-squared: 0.8101

F-statistic: 39.4 on 1 and 8 DF, p-value: 0.0002386

**> sqrt(sum(reg$residuals^2)/nrow(Emp\_data)) #RMSE**

**[1] 3.997528**

**# Logarithmic Model**

> summary(reg\_log)

Call:

lm(formula = Emp\_data$Churn\_out\_rate ~ log(Emp\_data$Salary\_hike))

Residuals:

Min 1Q Median 3Q Max

-3.678 -2.851 -1.794 2.275 7.624

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 1381.5 195.4 7.070 0.000105 \*\*\*

log(Emp\_data$Salary\_hike) -176.1 26.3 -6.697 0.000153 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 4.233 on 8 degrees of freedom

**Multiple R-squared: 0.8486**, Adjusted R-squared: 0.8297

F-statistic: 44.85 on 1 and 8 DF, p-value: 0.0001532

**> sqrt(sum(reg\_log$residuals^2)/nrow(Emp\_data)) #RMSE**

**[1] 3.78600**

**# Exponential Mode**

summary(reg\_exp)

Call:

lm(formula = log(Emp\_data$Churn\_out\_rate) ~ Emp\_data$Salary\_hike)

Residuals:

Min 1Q Median 3Q Max

-0.04825 -0.03519 -0.01909 0.02942 0.08970

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 6.6383000 0.3175983 20.902 2.88e-08 \*\*\*

Emp\_data$Salary\_hike -0.0013963 0.0001878 -7.434 7.38e-05 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.0519 on 8 degrees of freedom

**Multiple R-squared: 0.8735**, Adjusted R-squared: 0.8577

F-statistic: 55.26 on 1 and 8 DF, p-value: 7.377e-05

**> sqrt(sum(error^2)/nrow(Emp\_data)) #RMSE**

**[1] 3.541549**

**Salary hike Output**

> summary(Emp\_data)

Salary\_hike Churn\_out\_rate

Min. :1580 Min. :60.00

1st Qu.:1618 1st Qu.:65.75

Median :1675 Median :71.00

Mean :1689 Mean :72.90

3rd Qu.:1724 3rd Qu.:78.75

Max. :1870 Max. :92.00

# Simple Linear Regression model

> summary(reg)

Call:

lm(formula = Emp\_data$Salary\_hike ~ Emp\_data$Churn\_out\_rate)

Residuals:

Min 1Q Median 3Q Max

-35.97 -23.13 -21.41 19.24 75.80

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 2285.365 95.912 23.828 1.02e-08 \*\*\*

Emp\_data$Churn\_out\_rate -8.186 1.304 -6.277 0.000239 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 40.13 on 8 degrees of freedom

**Multiple R-squared: 0.8312**, Adjusted R-squared: 0.8101

F-statistic: 39.4 on 1 and 8 DF, p-value: 0.0002386

**> sqrt(sum(reg$residuals^2)/nrow(Emp\_data)) #RMSE**

**[1] 35.89264**

**# Logarithmic Model**

> summary(reg\_log)

Call:

lm(formula = Emp\_data$Salary\_hike ~ log(Emp\_data$Churn\_out\_rate))

Residuals:

Min 1Q Median 3Q Max

-30.97 -23.89 -16.82 14.83 64.97

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 4366.44 360.39 12.116 1.99e-06 \*\*\*

log(Emp\_data$Churn\_out\_rate) -625.60 84.15 -7.434 7.38e-05 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 34.74 on 8 degrees of freedom

**Multiple R-squared: 0.8735**, Adjusted R-squared: 0.8577

F-statistic: 55.26 on 1 and 8 DF, p-value: 7.377e-05

**> sqrt(sum(reg\_log$residuals^2)/nrow(Emp\_data)) #RMSE**

**[1] 31.06952**

**# Exponential Mode**

> summary(reg\_exp)

Call:

lm(formula = log(Emp\_data$Salary\_hike) ~ Emp\_data$Churn\_out\_rate)

Residuals:

Min 1Q Median 3Q Max

-0.02011 -0.01244 -0.01194 0.01093 0.04119

Coefficients:

Estimate Std. Error t value Pr(>|t|)

(Intercept) 7.7816303 0.0529201 147.045 5.12e-15 \*\*\*

Emp\_data$Churn\_out\_rate -0.0048187 0.0007195 -6.697 0.000153 \*\*\*

---

Signif. codes: 0 ‘\*\*\*’ 0.001 ‘\*\*’ 0.01 ‘\*’ 0.05 ‘.’ 0.1 ‘ ’ 1

Residual standard error: 0.02214 on 8 degrees of freedom

**Multiple R-squared: 0.8486**, Adjusted R-squared: 0.8297

F-statistic: 44.85 on 1 and 8 DF, p-value: 0.0001532

**> sqrt(sum(error^2)/nrow(Emp\_data)) #RMSE**

**[1] 34.26855**