Set – 14:

1. Prime or not a prime


```
> num = as.integer(readline(prompt="Enter a number: "))
Enter a number: 57
> flag = 0
> # prime numbers are greater than 1
> if(num > 1) {
+   # check for factors
+   flag = 1
+   for(i in 2:(num-1)) {
+     if ((num %% i) == 0) {
+       flag = 0
+       break
+     }
+   }
+ }
> if(num == 2)    flag = 1
> if(flag == 1) {
+   print(paste(num,"is a prime number"))
+ } else {
+   print(paste(num,"is not a prime number"))
+ }
[1] "57 is not a prime number"
```

Figure 67: checking a number is prime or not

2. Replace

```
> x <- c("a very nice character string")
>
> str_replace(x, "c", "ab")
[1] "a very niabe character string"
>
> str_replace_all(x, "c", "ab")
[1] "a very niabe abharaabter string"
>
```

Figure 25: replacing characters in a string using str_replace() and str_replace_all()

3. Poisson Regression

Poisson Regression

Poisson Regression involves regression models in which the response variable is in the form of counts and not fractional numbers. For example, the count of number of births or number of wins in a football match series. Also the values of the response variables follow a Poisson distribution.
The general mathematical equation for Poisson regression is

$\log(y) = a + b_1x_1 + b_2x_2 + ...b_nx_n$ Following is the description of the parameters used

- y is the response variable
- a and b are the numeric coefficients
- x is the predictor variable

Syntax: glm (formula , data , family)

Following is the description of the parameters used in above functions

- formula is the symbol presenting the relationship between the variables
- data is the data set giving the values of these variables
- family is R object to specify the details of the model. It's value is Poisson for Poisson Regression

1. Load the mtcars dataset:

```R
data(mtcars)
```

2. Create a Poisson regression model using the glm() function with the family argument set to "poisson":

```R
model <- glm(mpg ~ ., data = mtcars, family = poisson)
```

This creates a Poisson regression model where "mpg" is the target variable and "." represents all other variables in the dataset.

3. Print the summary of the Poisson regression model:

```R
summary(model)
```

Regenerate response

```
summary(model)
```

This will provide detailed information about the Poisson regression model, including coefficients, p-values, deviance, and more.

4. Extract specific information from the Poisson regression model:

```R
# Coefficients
coefficients <- coef(model)
print(coefficients)

# Deviance
deviance <- model$deviance
print(deviance)
```

The coefficients represent the estimated regression coefficients for each predictor variable, and the deviance represents the goodness-of-fit of the model.

4. sin(x)

```R
# Generate x values
x <- seq(-3, 3, by = 0.1)

# Compute corresponding y values using the sin function
y <- sin(x)

# Plot the function with triangles for y = 1 and no point characters for other y values
plot(x, y, type = "n", xlab = "x", ylab = "f(x)", xlim = c(-3, 3), ylim = c(-1, 1))
points(x[y == 1], y[y == 1], pch = 2, col = "black")
lines(x, y, col = "black")
```

Program input

Output