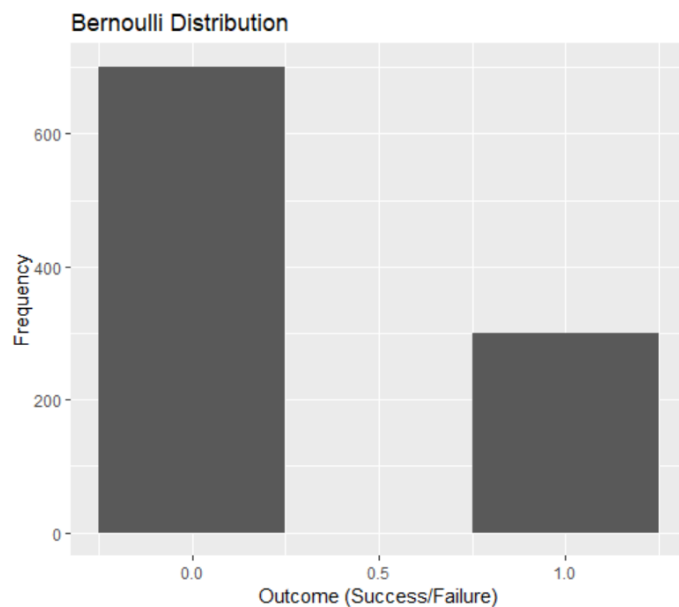
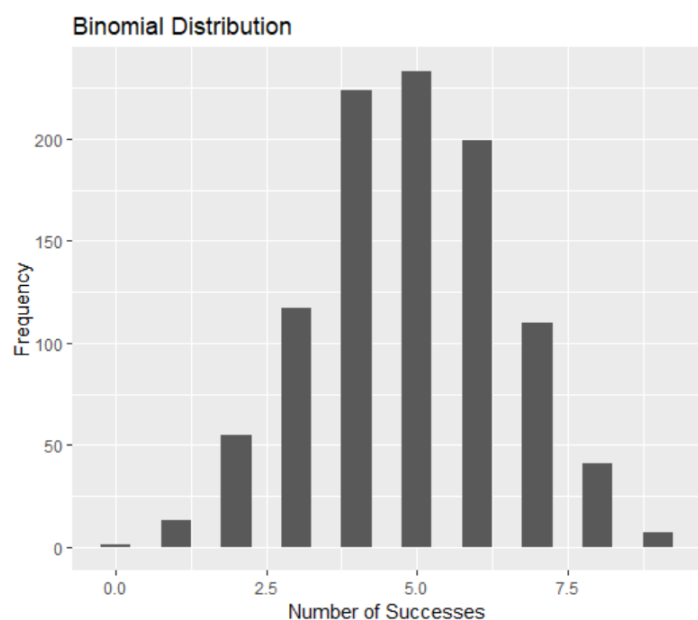
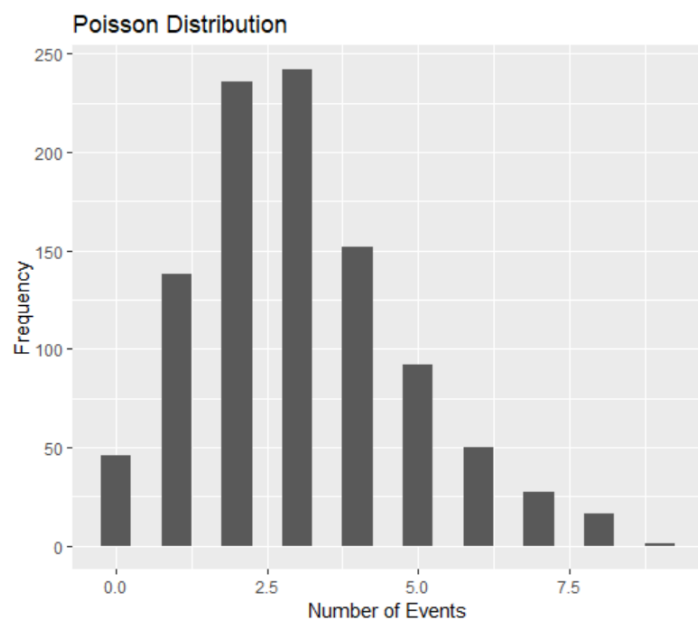


```

1 library(ggplot2)
2 data <- read.csv("mtcars.csv")
3 # Perform linear regression
4 linear_model <- lm(hp ~ mpg, data = data)
5 # Perform multiple regression
6 multiple_model <- lm(hp ~ mpg + disp, data = data)
7 # Perform polynomial regression
8 poly_model <- lm(hp ~ poly(mpg, degree = 2), data = data)
9 # Evaluate model performance
10 summary(linear_model)
11 summary(multiple_model)
12 summary(poly_model)
13 # Visualize regression results
14 ggplot(data, aes(x = hp, y = hp)) +
15   geom_point() +
16   geom_smooth(method = "lm", se = FALSE, color = "blue") +
17   labs(title = "Regression Analysis", x = "Independent Variable", y = "Dependent Variable")
18

```

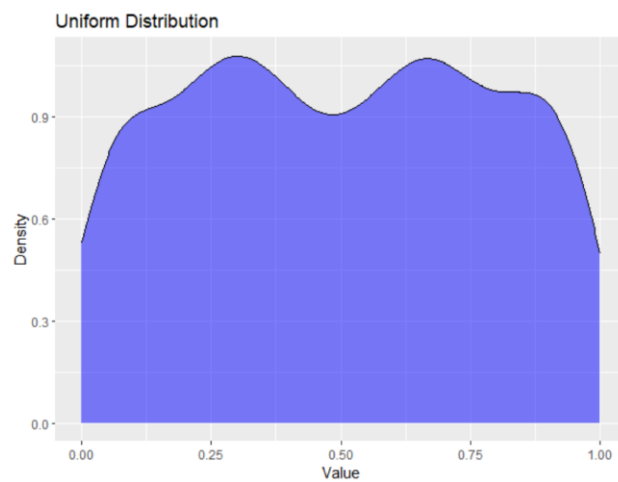
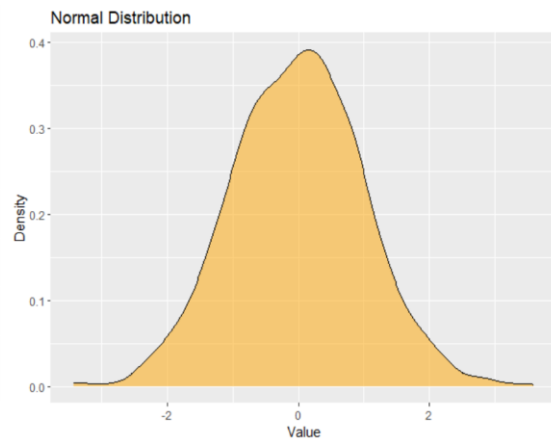
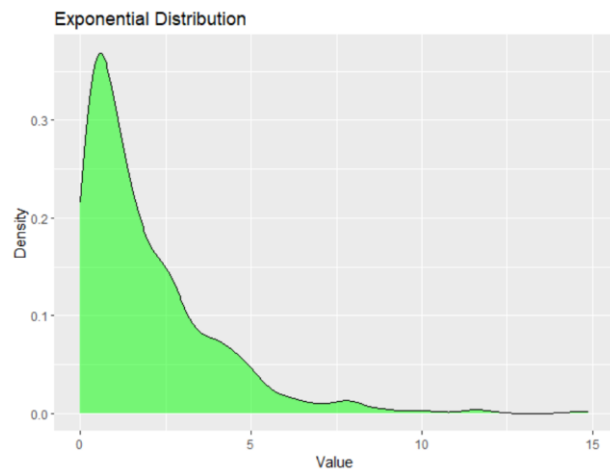




```

1 library(ggplot2)
2 bernoulli_data <- rbinom(n = 1000, size = 1, prob = 0.3)
3 # Simulate Binomial distribution
4 binomial_data <- rbinom(n = 1000, size = 10, prob = 0.5)
5 # Simulate Poisson distribution
6 poisson_data <- rpois(n = 1000, lambda = 3)
7 # Plot probability mass functions (PMFs)
8 ggplot(data.frame(x = bernoulli_data), aes(x = x)) +
9   geom_bar(stat = "count", width = 0.5) +
10   labs(title = "Bernoulli Distribution", x = "Outcome (Success/Failure)", y = "Frequency")
11 ggplot(data.frame(x = binomial_data), aes(x = x)) +
12   geom_bar(stat = "count", width = 0.5) +
13   labs(title = "Binomial Distribution", x = "Number of Successes", y = "Frequency")
14 ggplot(data.frame(x = poisson_data), aes(x = x)) +
15   geom_bar(stat = "count", width = 0.5) +
16   labs(title = "Poisson Distribution", x = "Number of Events", y = "Frequency")

```



```
1 library(ggplot2)
2 # Simulate Uniform distribution
3 uniform_data <- runif(1000, min = 0, max = 1)
4 # Simulate Exponential distribution
5 exponential_data <- rexp(1000, rate = 0.5)
6 # Simulate Normal distribution
7 normal_data <- rnorm(1000, mean = 0, sd = 1)
8 # Plot density plots
9 ggplot(data.frame(x = uniform_data), aes(x = x)) +
10   geom_density(fill = "blue", alpha = 0.5) +
11   labs(title = "Uniform Distribution", x = "Value", y = "Density")
12
13 ggplot(data.frame(x = exponential_data), aes(x = x)) +
14   geom_density(fill = "green", alpha = 0.5) +
15   labs(title = "Exponential Distribution", x = "Value", y = "Density")
16
17 ggplot(data.frame(x = normal_data), aes(x = x)) +
18   geom_density(fill = "orange", alpha = 0.5) +
19   labs(title = "Normal Distribution", x = "Value", y = "Density")
```