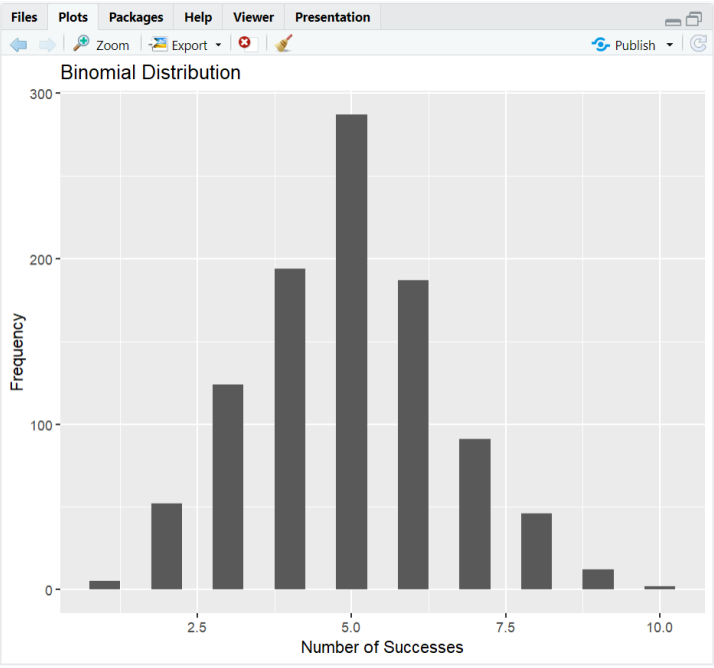
Exp-2.2:

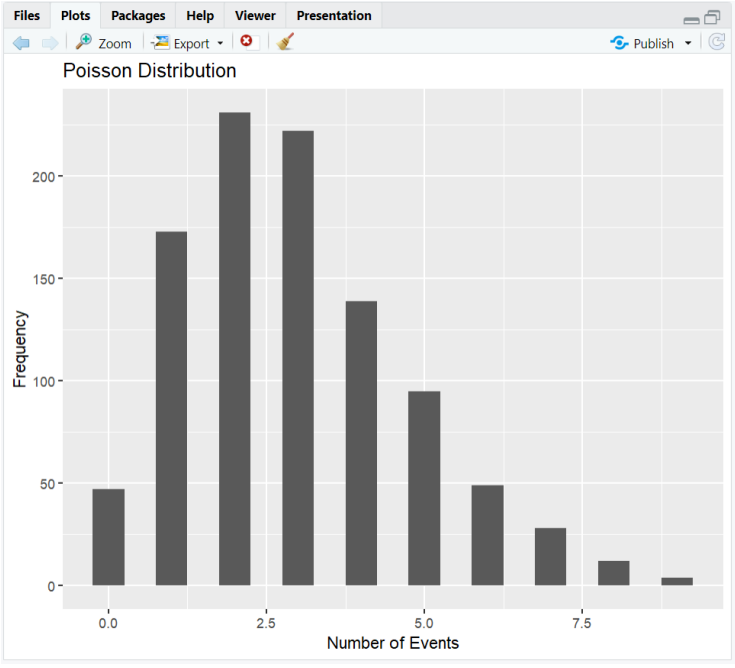
Code:

```r
# Load necessary libraries
library(ggplot2)

#20BCS4885_Sandeep Kumar
# Simulate Bernoulli distribution
bernoulli_data <- rbinom(n = 1000, size = 1, prob = 0.3)

# Simulate Binomial distribution
binomial_data <- rbinom(n = 1000, size = 10, prob = 0.5)

# Simulate Poisson distribution
poisson_data <- rpois(n = 1000, lambda = 3)

# Plot probability mass functions (PMFs)
ggplot(data.frame(x = bernoulli_data), aes(x = x)) +
  geom_bar(stat = "count", width = 0.5) +
  labs(title = "Bernoulli Distribution", x = "Outcome (Success/Failure)", y = "Frequency")

ggplot(data.frame(x = binomial_data), aes(x = x)) +
  geom_bar(stat = "count", width = 0.5) +
  labs(title = "Binomial Distribution", x = "Number of Successes", y = "Frequency")

ggplot(data.frame(x = poisson_data), aes(x = x)) +
   geom_bar(stat = "count", width = 0.5) +
  labs(title = "Poisson Distribution", x = "Number of Events", y = "Frequency")
```

```
+   labs(title = "Binomial Distribution", x = "Number of Successes", y = "Frequency")
>
> #ggplot(data.frame(x = poisson_data), aes(x = x)) +
> #  geom_bar(stat = "count", width = 0.5) +
> #  labs(title = "Poisson Distribution", x = "Number of Events", y = "Frequency")
>
```

Output:





Exp-2.3:

Code:

RStudio

File Edit Code View Plots Session Build Debug Profile Tools Help

Untitled1*

```
# Load necessary libraries
library(ggplot2)

#20BCS4885_Sandeep Kumar
# Simulate Uniform distribution
uniform_data <- runif(1000, min = 0, max = 1)

# Simulate Exponential distribution
exponential_data <- rexp(1000, rate = 0.5)

# Simulate Normal distribution
normal_data <- rnorm(1000, mean = 0, sd = 1)

# Plot density plots
ggplot(data.frame(x = uniform_data), aes(x = x)) +
  geom_density(fill = "blue", alpha = 0.5) +
  labs(title = "Uniform Distribution", x = "Value", y = "Density")

ggplot(data.frame(x = exponential_data), aes(x = x)) +
  geom_density(fill = "green", alpha = 0.5) +
  labs(title = "Exponential Distribution", x = "Value", y = "Density")

ggplot(data.frame(x = normal_data), aes(x = x)) +
  geom_density(fill = "orange", alpha = 0.5) +
  labs(title = "Normal Distribution", x = "Value", y = "Density")
```

13:1 (Top Level) R Script

R 4.3.2 · ~/

```
> #  labs(title = "Exponential Distribution", x = "Value", y = "Density")
>
> ggplot(data.frame(x = normal_data), aes(x = x)) +
+   geom_density(fill = "orange", alpha = 0.5) +
+   labs(title = "Normal Distribution", x = "Value", y = "Density")
>
```

Output: