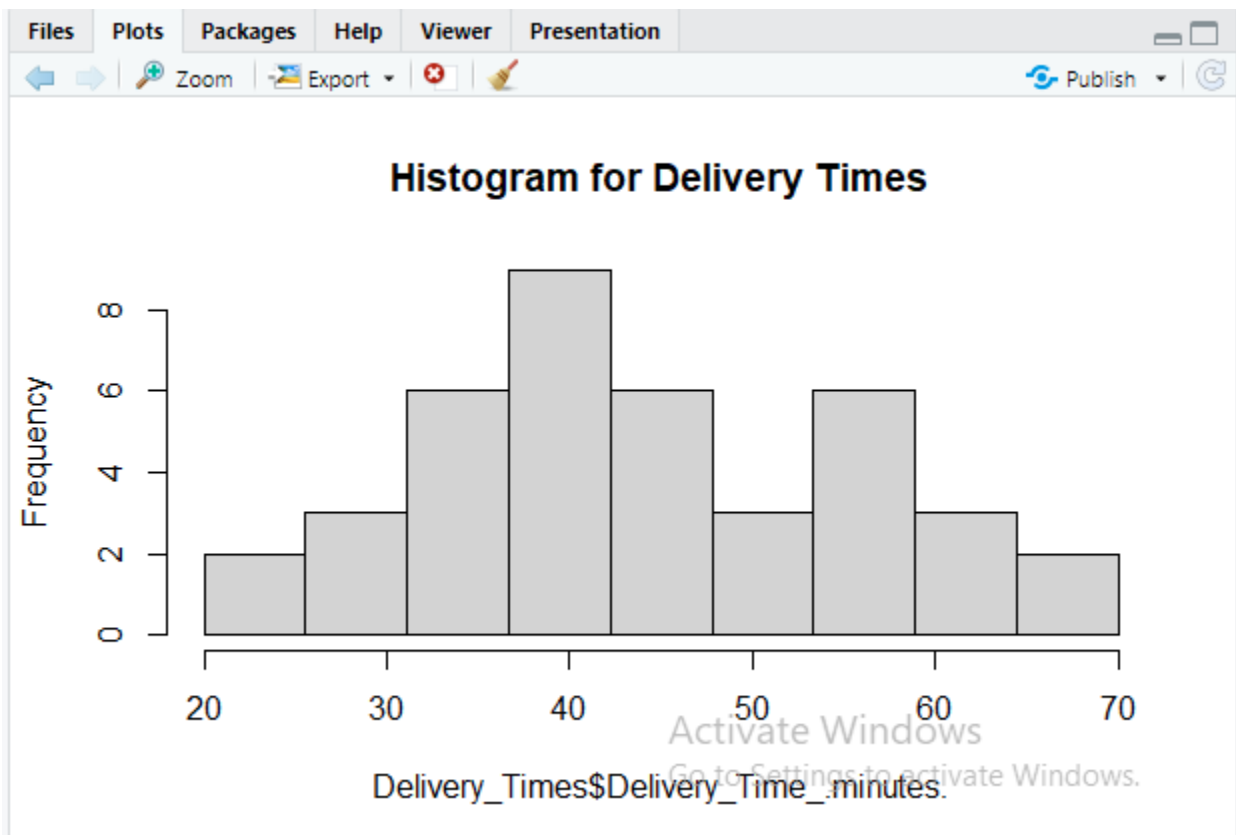**Exercise**

1. Import the dataset ('Exercise – Lab 05.txt') into R and store it in a data frame called "Delivery_Times".

```
> Delivery_Times <- read.table("Exercise - Lab 05.txt", header = TRUE)
> View(Delivery_Times)
```

2. Draw a histogram for deliver times using nine class intervals where the lower limit is 20 and upper limit is 70. Use right open intervals.

```
> histogram <- hist(Delivery_Times$Delivery_Time_.minutes.,
+                   main = "Histogram for Delivery Times",
+                   breaks = seq(20, 70, length = 10),
+                   right = FALSE)
> str(Delivery_Times)
'data.frame':   40 obs. of  1 variable:
 $ Delivery_Time_.minutes.: int  34 54 47 29 39 61 20 40 57 36 ...
```

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Histogram for Delivery Times

3. Comment on the shape of the distribution.

```
> colnames((Delivery_Times))
[1] "Delivery_Time_.minutes."
> breaks <- round(histogram$breaks)
> freq <- histogram$counts
> mids <- histogram$mids
> classes <- c()
> for(i in 1:(length(breaks)-1)) {
+     classes[i] <- paste0("[", breaks[i], ",", breaks[i+1], ")")
+ }
> |
```

Bell shape/Normal because the bars are all taller in the middle and tapper off.

4. Draw a cumulative frequency polygon (ogive) for the data in a separate plot.

```
+ }
> cbind(Classes = classes, Frequency = freq, Midpoint = mids)
      Classes   Frequency Midpoint
 [1,] "[20,26)" "2"       "22.7777777777778"
 [2,] "[26,31)" "3"       "28.3333333333333"
 [3,] "[31,37)" "6"       "33.8888888888889"
 [4,] "[37,42)" "9"       "39.4444444444444"
 [5,] "[42,48)" "6"       "45"
 [6,] "[48,53)" "3"       "50.5555555555556"
 [7,] "[53,59)" "6"       "56.1111111111111"
 [8,] "[59,64)" "3"       "61.6666666666667"
 [9,] "[64,70)" "2"       "67.2222222222222"
> cum_freq <- cumsum(freq)
> (breaks[-1])
- -
 L9,J    LU4,/UJ    2           U/.LLLLLLLLLLLLLL
> cum_freq <- cumsum(freq)
> (breaks[-1])
[1] 26 31 37 42 48 53 59 64 70
> plot(breaks[-1], cum_freq,
+       type = "o", pch = 16, col = "blue",
+       main = "Cumulative Frequency Polygon (Ogive)",
+       xlab = "Delivery Time", ylab = "Cumulative Frequency")
> |
```

Cumulative Frequency Polygon (Ogive)