Exercises 8

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Exercise 1

```
# A

set.seed(500)
sample(x = 1:100, size = 5 )
```

```
## [1] 27 47 53 41 31
```

```
# B
set.seed(500)
sample(x = 1:100, size = 5 )
```

```
## [1] 27 47 53 41 31
```

```
# C
set.seed(NULL)
sample(x = 1:100, size = 5 )
```

```
## [1] 83 89 15 22 49
```

Removing the set seed makes the program pick a random seed to utilize. Thus the sample is no longer (easily) reproducable.

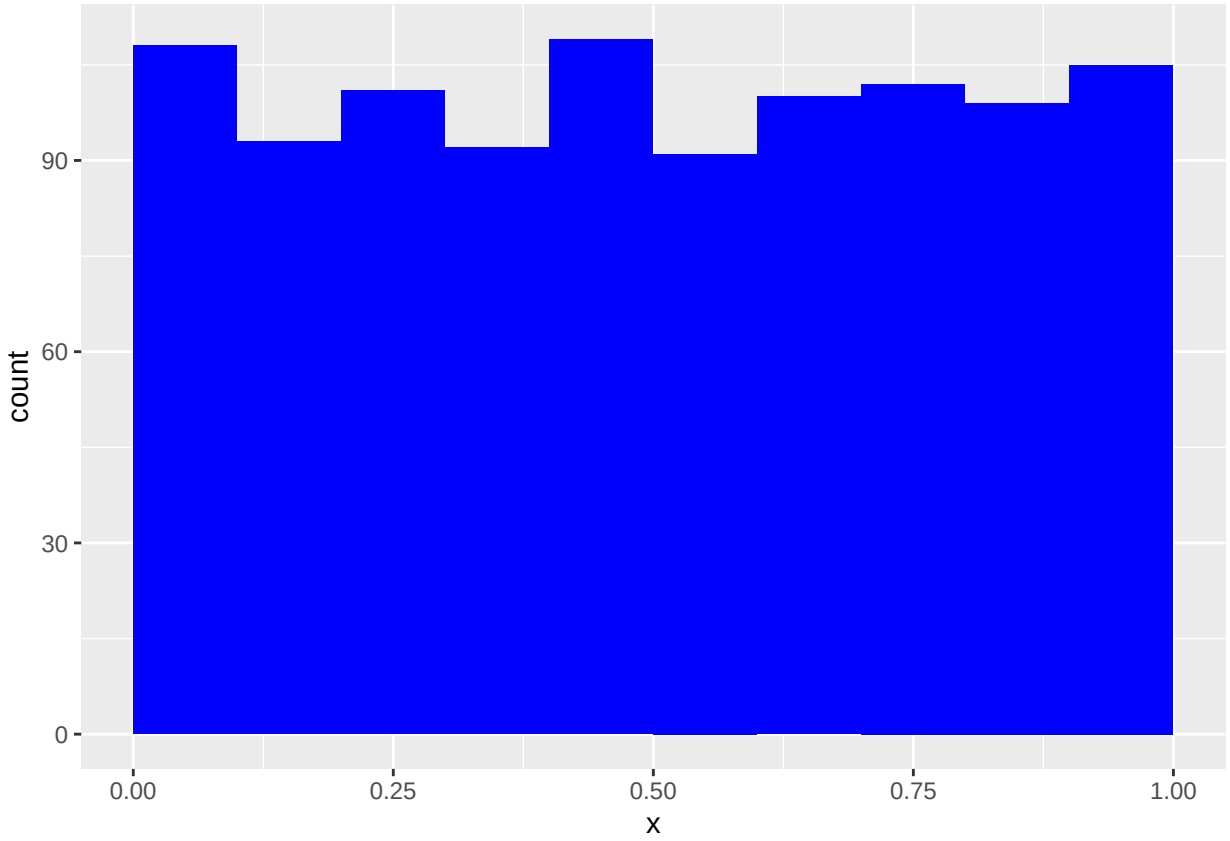
Exercise 2

```
# A

x <- runif(1000, 0, 1)

# B

ggplot(data.frame(x = x), mapping = aes(x = x)) +
    geom_histogram(binwidth = 0.1, boundary = 0.0, fill = "blue")
```

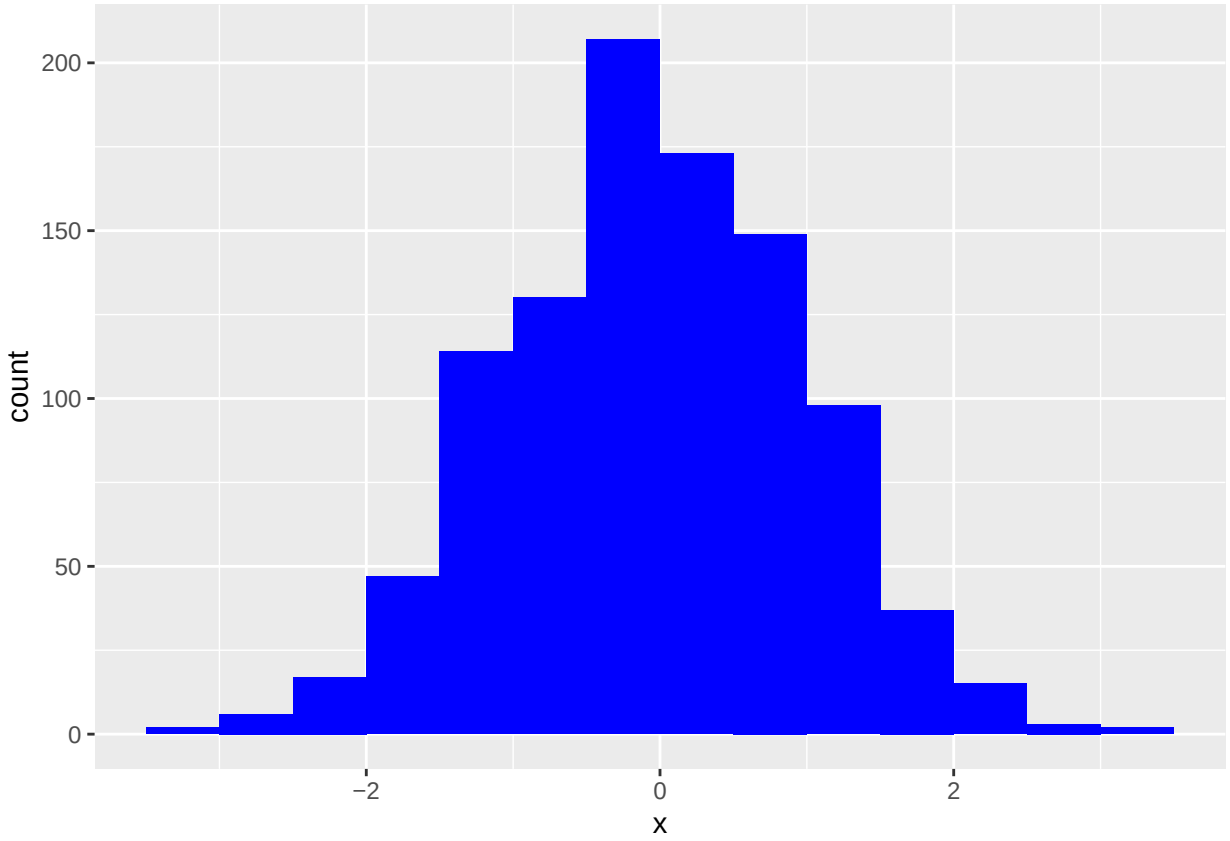


They are roughly evenly spread across 0 to 1.

Exercise 3

```
x <- rnorm(1000, 0, 1)

ggplot(data.frame(x = x), mapping = aes(x = x)) +
    geom_histogram(binwidth = 0.5, boundary = -3.5, fill = "blue")
```



The simulated values do follow a bell-shaped pattern.

Exercise 4

```
#A

rbinom(n = 10, prob = 0.7, size = 1)
```

```
##  [1] 0 1 1 0 0 1 1 1 1 1
```

```
my.probs <- seq(from = 0.95, to = 0.05, by = -0.1)
rbinom(n = 10, prob = my.probs, size = 1)
```

```
##  [1] 1 1 0 1 0 0 0 0 1 0
```

Exercise 5

```
# B0 = 4 B1 = -1 n = 1000
set.seed(57)

x <- runif(1000, 0, 10)
true_probs <- exp(4 - 1 * x) / (1 + exp(4 - 1 * x))
y <- rbinom(n = 1000, size = 1, prob = true_probs)
sim.data <- data.frame(X = x, Y = y)

head(sim.data)
```

```
##           X Y
## 1 2.4391435 0
## 2 5.1294954 0
## 3 0.3862843 1
## 4 1.6617658 1
## 5 7.3320525 0
## 6 6.6280162 0
```