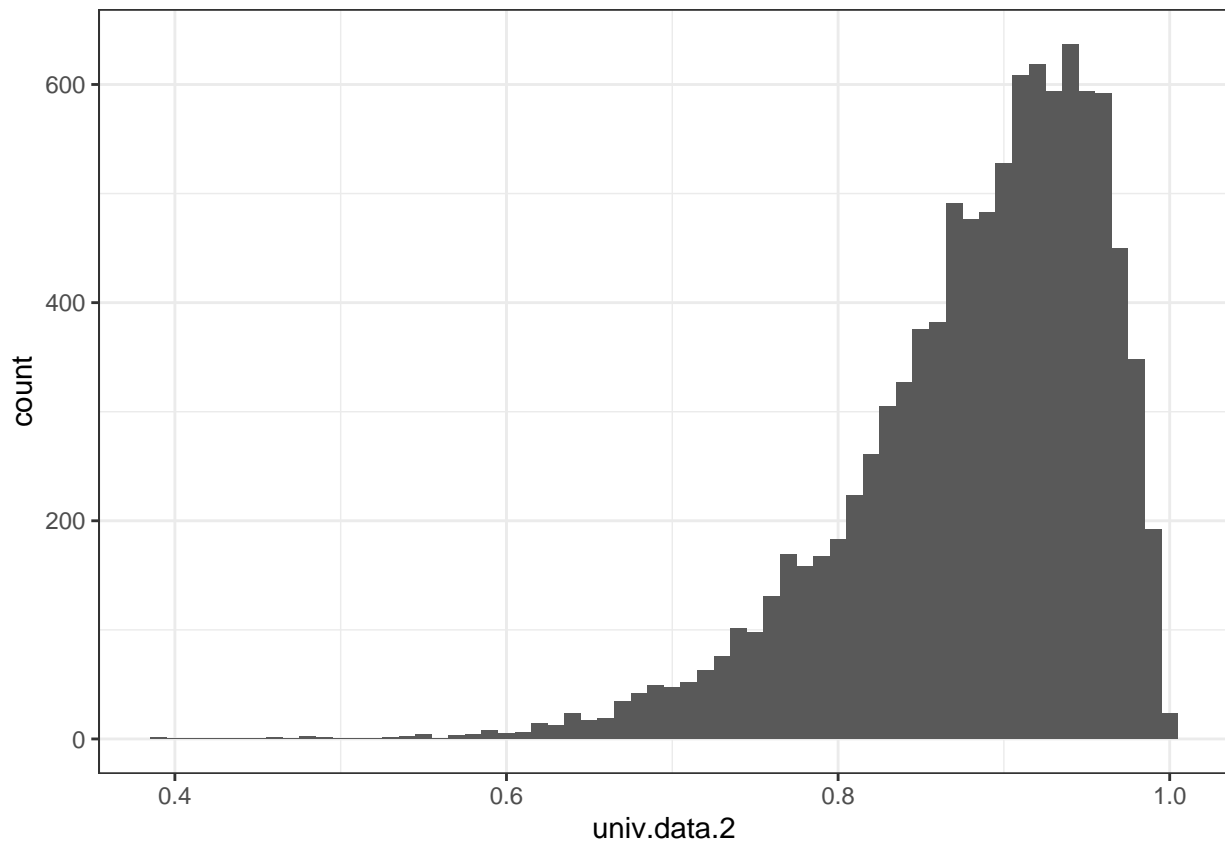# Central_Limit_Theorem

Sachith M Gunawardane

2023-05-25

```
library(ggplot2)
```

Univariate Data - Non-normal Population

```
#Basic histogram for Non-normal population
univ.data.2 <- rbeta(10000, shape1 = 15, shape2 = 2)
ggplot(as.data.frame(univ.data.2), aes(x=univ.data.2)) + geom_histogram(binwidth = 0.01) + theme_bw()
```
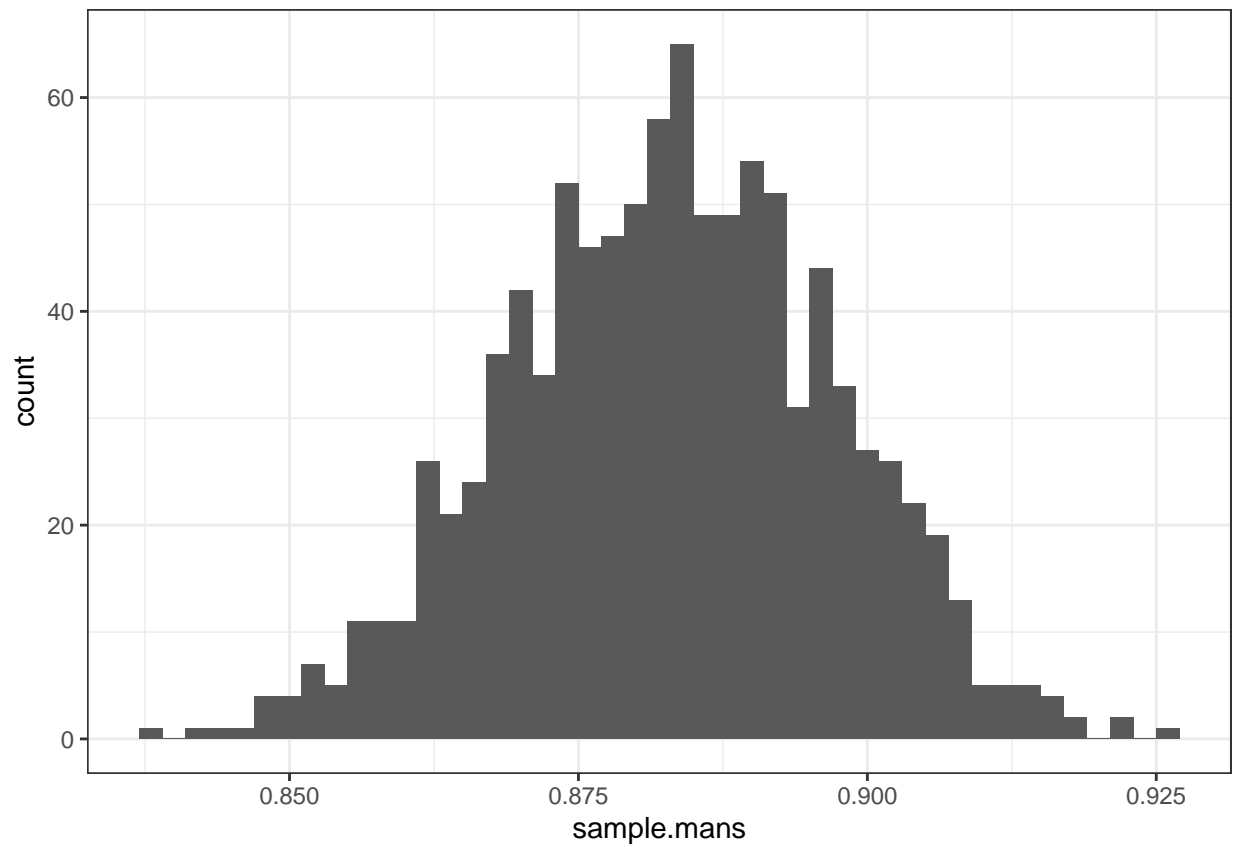


```
# Sample from skewed population distribution
sample.size <- 30
```

```
num.samples <- 1000
sample.mans <- replicate(num.samples, mean(sample(x = univ.data.2, size = sample.size)))
p2 <- ggplot(data = NULL, aes(x=sample.mans)) + geom_histogram(binwidth = 0.002) + theme_bw()

p2
```
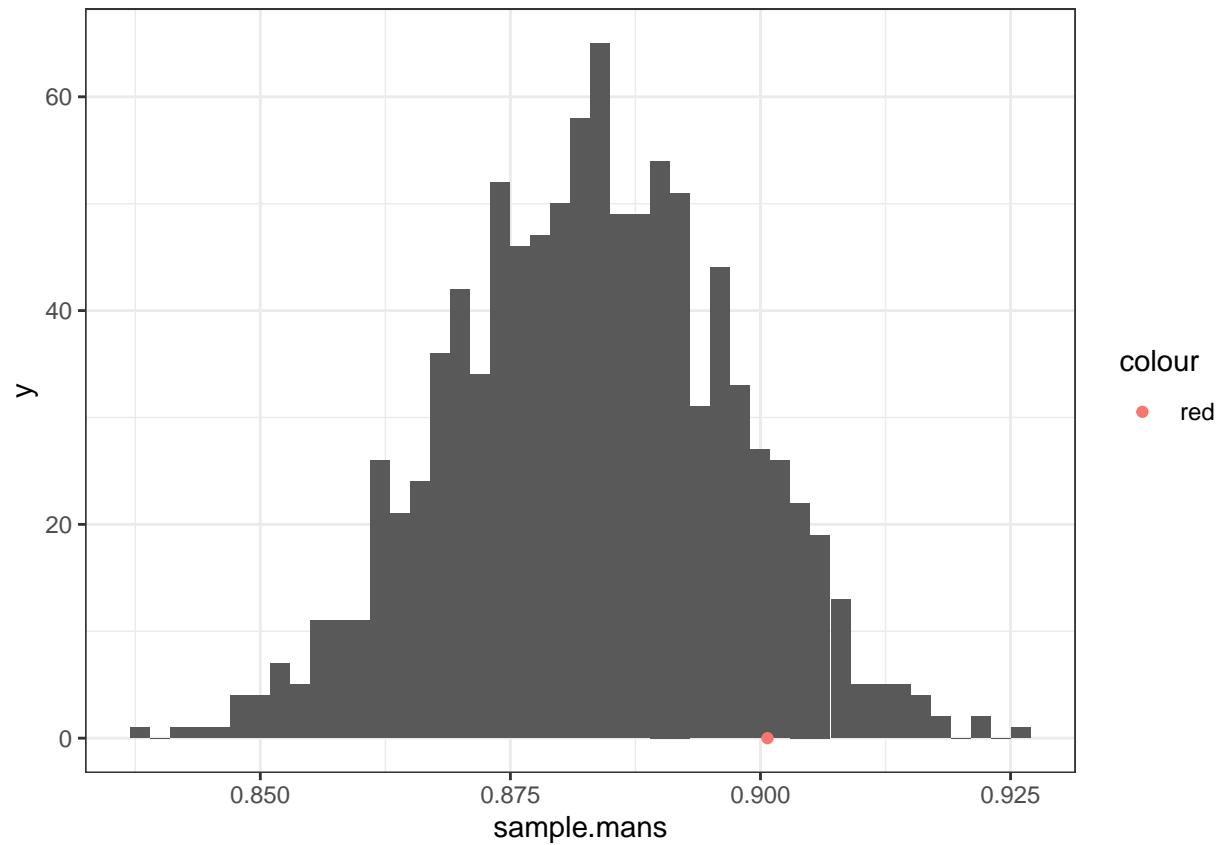


```
rand.s.1 <- sample(univ.data.2, sample.size)
s.1.mean <- mean(rand.s.1)
p2 + geom_point(data = as.data.frame(s.1.mean), aes(x=s.1.mean, y=0, col='red'))
```

Idea of the hypothesis testing is to find the position of sample mean in the sample distribution. And if it falls within 95% of data from the distribution sample mean then we can't reject if not reject the H0