Chaper 6 - Confidence Intervals

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Contents

Q1: For sampling distribution, it can have sampling size n and sampling time m, what determines if it follows CLT? n or m? If we sample for 1 time and 100 times, each time with same size n, does that makes a difference?

1 CLT and Sampling Distribution

```
##
## Attaching package: 'dplyr'

## The following objects are masked from 'package:stats':
##
##     filter, lag

## The following objects are masked from 'package:base':
##
##     intersect, setdiff, setequal, union

## [1] 0.5727877
```

```
## [1] 0.1808424
```

```
## [1] 0.1581139
```

```
## [1] 0.528862
```

```
## [1] 0.112364
```

```
## [1] 0.1118034
```

```
## [1] 0.494508
```

```
## [1] 0.08754722
```

```
## [1] 0.09128709
```

```
## [1] 0.5847735
```

```
## [1] 0.5367311
```

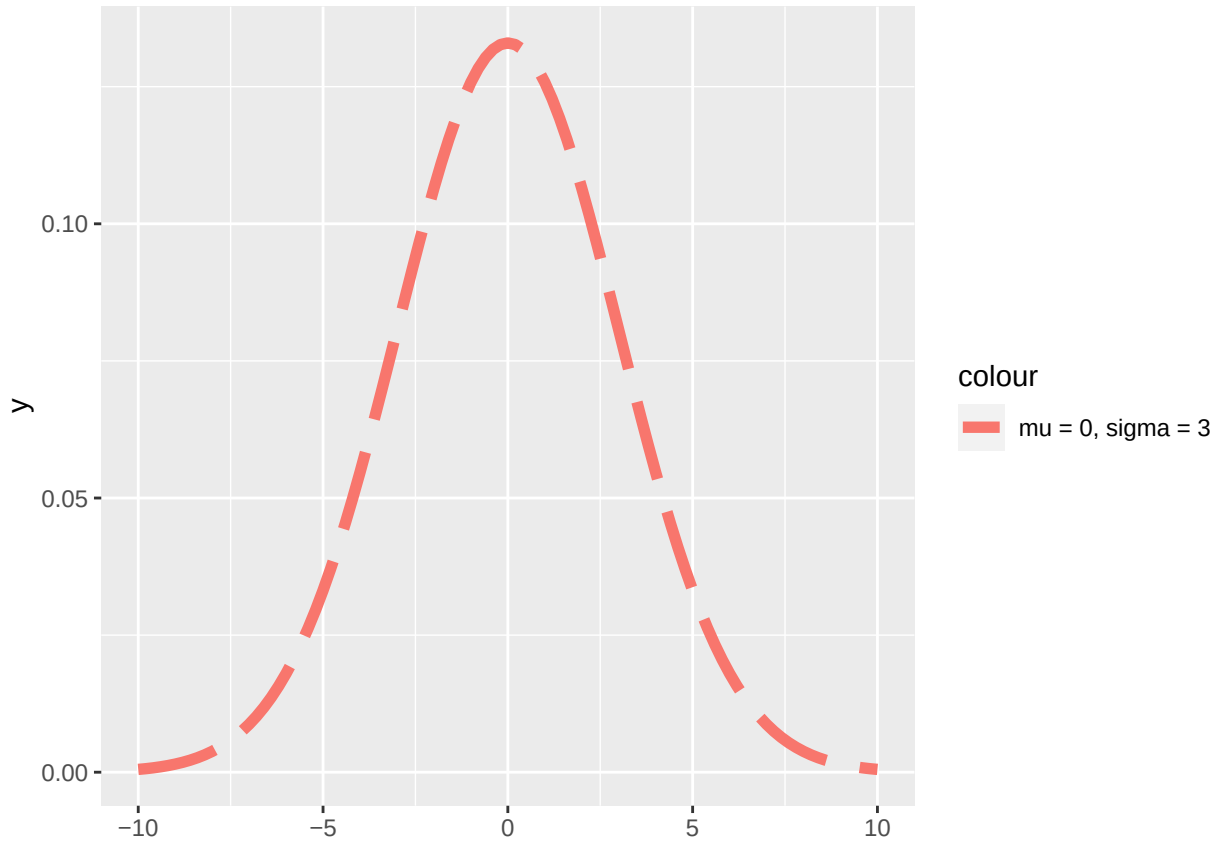
```
## [1] 0.5
```

2 Margin of Error and Sample Size

$n = \left\lceil \frac{z^2_{\alpha/2} \cdot \sigma^2}{m^2} \right\rceil$

3 Normal Distribution Curve with ggplot 正态分布曲线

```
## -- Attaching packages --------------------------------------- tidyverse 1.3.2 --
## v ggplot2 3.3.6     v purrr   0.3.4
## v tibble  3.1.8     v stringr 1.4.1
## v tidyr   1.2.1     v forcats 0.5.2
## v readr   2.1.3
## -- Conflicts ------------------------------------------ tidyverse_conflicts() --
## x dplyr::filter() masks stats::filter()
## x dplyr::lag()    masks stats::lag()
```


0.10
0.05
0.00
y
−10
−5
0
5
10
colour
mu = 0, sigma = 3

4 t distribution curve with ggplot T 分布曲线