

# 第七讲习题

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GitHub 地址: [MarkdownNotes/R at main · Bluuur/MarkdownNotes \(github.com\)](https://github.com/Bluuur/MarkdownNotes)

1.假设:

$H_0$ : 元件的平均寿命为 225 小时

$H_A$ : 元件的平均寿命不为 225 小时

```
1 data <- c(159, 280, 101, 212, 224, 379, 179, 264, 222, 362, 168, 250, 149,
2 260, 485, 170)
3 t.test(data, mu = 225)
```

One Sample t-test

```
1 data: data
2 t = 0.66852, df = 15, p-value = 0.514
3 alternative hypothesis: true mean is not equal to 225
4 95 percent confidence interval:
5 188.8927 294.1073
6 sample estimates:
7 mean of x
8 241.5
```

元件的平均寿命不是 225 小时

2.假设

$H_0$ : 两个班选课比例相同

$H_A$ : 两个班选课比例不同

```
1 x<- c(28, 22)
2 y <- c(31, 31)
3 prop.test(x, y)
```

2-sample test for equality of proportions with continuity correction

```
1 data: x out of y
2 X-squared = 2.5833, df = 1, p-value = 0.108
3 alternative hypothesis: two.sided
4 95 percent confidence interval:
5 -0.02940064 0.41649741
6 sample estimates:
7 prop 1 prop 2
8 0.9032258 0.7096774
```

两个班的选课比例不同

3.假设

$H_0$ : 调查结果支持该市老年人口比重为 14.7%

$H_A$ : 调查结果不支持该市老年人口比重为 14.7%

```
1 binom.test(57, 400, 0.147)
2 prop.test(57, 400, 0.147, correct = F)
3 chisq.test(c(57, 343), p = c(0.147, 0.853))
```

Exact binomial test

```
1 data: 57 and 400
2 number of successes = 57, number of trials = 400, p-value = 0.8876
3 alternative hypothesis: true probability of success is not equal to 0.147
4 95 percent confidence interval:
5  0.1097477 0.1806511
6 sample estimates:
7 probability of success
8                0.1425
```

1-sample proportions test without continuity correction

```
1 data: 57 out of 400, null probability 0.147
2 x-squared = 0.064598, df = 1, p-value = 0.7994
3 alternative hypothesis: true p is not equal to 0.147
4 95 percent confidence interval:
5  0.1116383 0.1801630
6 sample estimates:
7      p
8 0.1425
```

Chi-squared test for given probabilities

```
1 data: c(57, 343)
2 x-squared = 0.064598, df = 1, p-value = 0.7994
```

调查结果不支持该市老年人口比重为 14.7% 的看法

```

1
2 x <- seq(-5, 5, length.out = 1000)
3 y <- dnorm(x)
4
5 plot(x, y, col = "red", xlim = c(-5, 5), ylim = c(0, 0.5), type = 'l',
6      xaxs = "i", yaxs = "i", ylab = 'density', xlab = 't',
7      main = "The T Density Distribution")
8
9 lines(x, dt(x, 3, 0), col = "green")
10 lines(x, dt(x, 5, 0), col = "blue")
11 lines(x, dt(x, 10, 0), col = "orange")
12
13 legend("topleft", legend = c("Normal", paste("n =", c(3, 5, 10))), lwd = 1,
14      col = c("red", "green", "blue", "orange"))

```



