

```

> x <- c(3, 7, 1, 2, 0, 7, 4, 5, 6, 2)
> x <- c(3, 7, 1, 2, 0, 7, 4, 5, 6, 2)
> # Perform one-sample t-test
> t.test(x, mu = 3)

One Sample t-test

data: x
t = 0.88662, df = 9, p-value = 0.3984
alternative hypothesis: true mean is not equal to 3
95 percent confidence interval:
 1.913994 5.486006
sample estimates:
mean of x
 3.7

> # Sample data
> weight <- c(17.6, 20.6, 22.2, 15.3, 21.0, 20.5, 18.5, 18.2)
> t.test(weight, mu = 25, alternative = "less")

One Sample t-test

data: weight
t = -8.2904, df = 8, p-value = 1.688e-05
alternative hypothesis: true mean is less than 25
95 percent confidence interval:
 -Inf 20.50095
sample estimates:
mean of x
 19.2

> res <- t.test(weight, mu = 25, alternative = "less")
>
> # Extract the test statistic
> res$statistic
      t
-8.290415
>
> # Extract the p-value
> res$p.value
[1] 1.687611e-05
>

```

```

      t
-8.290415
>
> # Extract the p-value
> res$p.value
[1] 1.687611e-05
>
> # Extract the confidence interval
> res$conf.int
[1] -Inf 20.50095
attr(,"conf.level")
[1] 0.95
> y <- c(9.5, 10.2, 10.1, 9.8, 10.3, 9.9, 10.0, 10.4, 9.7, 10.2)
>
> # Perform one-sample z-test using t.test (approximation)
> t.test(y, mu = 10, alternative = "greater")

One Sample t-test

data: y
t = 0.11111, df = 9, p-value = 0.457
alternative hypothesis: true mean is greater than 10
95 percent confidence interval:
 9.84502      Inf
sample estimates:
mean of x
 10.01

> # i. Generate a random sample of size 25
> set.seed(123) # for reproducibility
> baking_time <- rnorm(n = 25, mean = 45, sd = 2)
> t_test_result <- t.test(baking_time, mu = 46, alternative = "less")
> print(t_test_result)

One Sample t-test

data: baking_time
t = -2.8167, df = 24, p-value = 0.004776
alternative hypothesis: true mean is less than 46
95 percent confidence interval:
 -Inf 45.58124
sample estimates:
mean of x
 44.93334

```

```

> # i. Generate a random sample of size 25
> set.seed(123) # for reproducibility
> baking_time <- rnorm(n = 25, mean = 45, sd = 2)
> t_test_result <- t.test(baking_time, mu = 46, alternative = "less")
> print(t_test_result)

```

#### One Sample t-test

```

data: baking_time
t = -2.8167, df = 24, p-value = 0.004776
alternative hypothesis: true mean is less than 46
95 percent confidence interval:
 -Inf 45.58124
sample estimates:
mean of x
 44.93334

> t_test_result$statistic      # Test statistic
      t
-2.81669
> t_test_result$p.value       # P-value
[1] 0.004775633
> t_test_result$conf.int
[1] -Inf 45.58124
attr(,"conf.level")
[1] 0.95
>

```

The screenshot shows the RStudio interface. The top bar includes tabs for Environment, History, Connections, and Tutorial. Below the tabs is a toolbar with icons for file operations and a memory usage indicator (136 MiB). The main pane is divided into two sections: 'Data' and 'Values'.

**Data Section:**

Variable	Type	Length
res	List of	10
t_test_result	List of	10

**Values Section:**

Variable	Type	Values
baking_time	num	[1:25] 43.9 44.5 48.1 45.1 45.3 ...
weight	num	[1:9] 17.6 20.6 22.2 15.3 21 20.5 18.5 18.9 18.2
x	num	[1:10] 3 7 1 2 0 7 4 5 6 2
y	num	[1:10] 9.5 10.2 10.1 9.8 10.3 9.9 10 10.4 9.7 10.2