IT2120 - Probability and Statistic

Lab Sheet 09

IT24101821

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```r
setwd("C:\\Users\\USER\\OneDrive\\Desktop\\IT24101821")
#Question 01
x<-c(3,7,11,0,7,0,4,5,6,2)
t.test(x,mu = 3)

#Question 02
#part 1
Weight<-c(17.6,20.6,22.2,15.3,20.9,21.0,18.9,18.9,18.2)
t.test(Weight,mu=25,alternative="less")

#part 2
res<-t.test(Weight,mu=25,alternative="less")

res$statistic

res$p.value

res$conf.int

#Question 03
#part 1
y<-rnorm(30,mean=9.8,sd = 0.05)

#part 2
t.test(y,mu=10,alternative="greater")
```

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```
> setwd("C:\\Users\\USER\\OneDrive\\Desktop\\IT24101821")
> #Question 01
> x<-c(3,7,11,0,7,0,4,5,6,2)
> t.test(x,mu = 3)

        One Sample t-test

data:  x
t = 1.3789, df = 9, p-value = 0.2012
alternative hypothesis: true mean is not equal to 3
95 percent confidence interval:
 2.0392 6.9608
sample estimates:
mean of x
      4.5
```

```
> #Question 02
> #part 1
> Weight<-c(17.6,20.6,22.2,15.3,20.9,21.0,18.9,18.9,18.2)
> t.test(Weight,mu=25,alternative="less")

        One Sample t-test

data:  Weight
t = -8.0802, df = 8, p-value = 2.032e-05
alternative hypothesis: true mean is less than 25
95 percent confidence interval:
     -Inf 20.60322
sample estimates:
mean of x
 19.28889
```

```
> #part 2
> res<-t.test(Weight,mu=25,alternative="less")
> res$statistic
        t
-8.080223
> res$p.value
[1] 2.031945e-05
> res$conf.int
[1]      -Inf 20.60322
attr(,"conf.level")
[1] 0.95
```

```
20 #Question 03
21 #part 1
22 y<-rnorm(30,mean=9.8,sd = 0.05)
23
24 #part 2
25 t.test(y,mu=10,alternative="greater")
26
```

```
> #Question 03
> #part 1
> y<-rnorm(30,mean=9.8,sd = 0.05)
> #part 2
> t.test(y,mu=10,alternative="greater")

        One Sample t-test

data:  y
t = -24.333, df = 29, p-value = 1
alternative hypothesis: true mean is greater than 10
95 percent confidence interval:
 9.792949      Inf
sample estimates:
mean of x
 9.806464
```

```
28 #Exercise
29
30 #Question 01
31 #part 1
32 set.seed(123)
33 bake_time<-rnorm(25,mean=45,sd=2)
34 bake_time
35
36 #part 2
37 t_test_result <- t.test(bake_time, mu = 46, alternative = "less")
38
39 print("One-sample t-test Result:")
40 print(t_test_result)
41
42
43 # Extract specific values
44 t_test_result$statistic
45 t_test_result$p.value
46 t_test_result$conf.int
47
```

```
> #Exercise
> #Question 01
> #part 1
> set.seed(123)
> bake_time<-rnorm(25,mean=45,sd=2)
> bake_time
 [1] 43.87905 44.53965 48.11742 45.14102 45.25858 48.43013 45.92183 42.46988 43.62629 44.10868 47.44816
[12] 45.71963 45.80154 45.22137 43.88832 48.57383 45.99570 41.06677 46.40271 44.05442 42.86435 44.56405
[23] 42.94799 43.54222 43.74992
```

```
> #part 2
> t_test_result <- t.test(bake_time, mu = 46, alternative = "less")
> print("One-sample t-test Result:")
[1] "One-sample t-test Result:"
> print(t_test_result)

        One Sample t-test

data:  bake_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

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