ASSIGNMENT 7

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SUBJECT: MAT1011 L4
Registration no.:19BCI7005
SLOT : L4

1.An outbreak of Salmonella-related illness was attributed to ice cream produced at a certain factory. Scientists measured the level of Salmonella in 9 randomly sampled batches of ice cream. The levels (in MPN/g) were: 0.593 0.142 0.329 0.691 0.231 0.793 0.519 0.392 0.418 Is there evidence that the mean level of Salmonella in the ice cream is greater than 0.3 MPN/g?

```
x=c(0.593, 0.142, 0.329, 0.691, 0.231, 0.793, 0.519, 0.392, 0.418)
> t.test(x, alternative = "greater", mu = 0.3)

      One Sample t-test

data:  x
t = 2.2051, df = 8, p-value = 0.02927
alternative hypothesis: true mean is greater than 0.3
95 percent confidence interval:
 0.3245133       Inf
sample estimates:
mean of x
0.4564444
```

From the output we see that the p-value = 0.029. Hence, there is moderately strong evidence that the mean Salmonella level in the ice cream is above 0.3 MPN/g.

2. Suppose that 10 volunteers have taken an intelligence test; here are the results obtained. The average score of the entire population is 75 in the same test. Is there any significant difference (with a significance level of 95%) between the sample and population means, assuming that the variance of the population is not known. Scores: 65, 78, 88, 55, 48, 95, 66, 57, 79, 81

```
a = c(65, 78, 88, 55, 48, 95, 66, 57, 79, 81)
> t.test (a, mu=75)

      One Sample t-test

data:  a
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```
t = -0.78303, df = 9, p-value = 0.4537
alternative hypothesis: true mean is not equal to 75
95 percent confidence interval:
 60.22187 82.17813
sample estimates:
mean of x
     71.2
```

P-value=0.45>0.05 hence null hypothesis is true therefore 75 is population mean

3. Comparing two independent sample means, taken from two populations with unknown variance.The following data shows the heights of individuals of two different countries with unknown population variances. Is there any significant difference b/n the average heights of two groups.

```
a=c(175,168,168,190,156,181,182,175,174,179)
> b=c(185,169,173,173,188,186,175,174,179,180)
> t.test(a,b)

      Welch Two Sample t-test

data:  a and b
t = -0.94737, df = 15.981, p-value = 0.3576
alternative hypothesis: true difference in means is not equal to 0
95 percent confidence interval:
 -11.008795   4.208795
sample estimates:
mean of x mean of y
    174.8     178.2
```