

1. The effective life of insulating fluids at an accelerated load of 35 KV is being studied. Test data have been obtained for four types of fluids. The result from a completely randomized experiment is as follows:

Type I	Type II	Type III	Type IV
17.6	16.9	21.4	19.3
18.9	15.3	23.6	21.1
16.3	18.6	19.4	16.9
17.4	17.1	18.5	17.5
20.1	19.5	20.5	18.3
21.6	20.3	22.3	19.8

a) Is there any indication that the fluids differ at $\alpha = 0.1$. What about at $\alpha = 0.05$?

```
> df=data.frame(y,x)
> summary(aov(y~x))
          Df Sum Sq Mean Sq F value Pr(>F)
x              3   30.17    10.05    3.047 0.0525 .
Residuals    20   65.99     3.30
---
Signif. codes:  0 '***' 0.001 '**' 0.01 '*' 0.05 '.' 0.1 ' ' 1
```

the P value is meaningful at the confidence level of 90%, while it's meaningless at the confidence level of 95%. Which means there are difference at $\alpha=0.1$, with no difference at $\alpha=0.05$

b) Use the Tukey's HSD test to identify the fluid types that are different (if any).

```
> TukeyHSD(aov(y~x),conf.level=0.95)
Tukey multiple comparisons of means
95% family-wise confidence level

Fit: aov(formula = y ~ x)

$x
      diff      lwr      upr      p adj
B-A -0.7000000 -3.63540073 2.2354007 0.9080815
C-A  2.3000000 -0.63540073 5.2354007 0.1593262
D-A  0.1666667 -2.76873407 3.1020674 0.9985213
C-B  3.0000000  0.06459927 5.9354007 0.0440578
D-B  0.8666667 -2.06873407 3.8020674 0.8413288
D-C -2.1333333 -5.06873407 0.8020674 0.2090635
```

The C-B has relatively big difference (Still need to run t.test())

Q.N. 2) The article by James, E. L., Bonsall, M. B., Hoppitt, L., Tunbridge, E. M., Geddes, J. R., Milton, A. L., & Holmes, E. A. (2015) entitled “Computer game play reduces intrusive memories of experimental trauma via re-consolidation-update mechanisms” Psychological Science, 26, 1201-1215 uses the dataset provided in the link below:

<https://raw.githubusercontent.com/CrumpLab/statisticsLab/master/data/Jamesetal2015Experiment2.csv>

a) Import the data in R and determine its dimension

```
> Q2=read.csv("
> dim(Q2)
[1] 72 28
> |
```

b) Display the Visual Recognition Memory Test scores based on the experiments condition (Condition)

```
> summary(aov(Visual_Recognition_Memory_Test~Condition))
              Df Sum Sq Mean Sq F value Pr(>F)
Condition      1    8.4   8.403    1.955  0.166
Residuals     70  300.9   4.299
> |
```

0.166 > 0.05, which do not have enough invindence to conclude it has difference