

مثال/ اجريت تجربة باستخدام الالواح المنشقة تصميم RCBD لنوع واوقات الحش لحاصل الجت موزعة في سنة مكررات .

الحل/

المعطيات : العامل الرئيسي/ انواع الجت = T

العامل الثانوي / اوقات الحش = S

المكررات = R

المطلوب اثباته : ايجاد افضل توليفة تعطي افضل نوع وقت للحش

أ. ايجاد العامل الاول / انواع الجت

ب. ايجاد العامل الثاني / اوقات الحش

ج. ايجاد التداخل بين انواع واوقات الحش للجت

البرهان : استخدام SAS في ايجاد الالواح المنشقة / RCBD

❖ ادخال البيانات

```
Data TS;
Input T S Rep R;
If T=1 and S=1 then TS=11;
If T=1 and S=2 then TS=12;
If T=1 and S=3 then TS=13;
If T=1 and S=4 then TS=14;
If T=2 and S=1 then TS=21;
If T=2 and S=2 then TS=22;
If T=2 and S=3 then TS=23;
If T=2 and S=4 then TS=24;
If T=3 and S=1 then TS=31;
If T=3 and S=2 then TS=32;
If T=3 and S=3 then TS=33;
If T=3 and S=4 then TS=34;
Cards;
1 1 1 2.17
1 1 2 1.88
1 1 3 1.62
1 1 4 2.34
1 1 5 1.58
1 1 6 1.66
1 2 1 1.58
1 2 2 1.26
1 2 3 1.22
1 2 4 1.59
1 2 5 1.25
1 2 6 0.94
1 3 1 2.29
1 3 2 1.6
1 3 3 1.67
1 3 4 1.91
1 3 5 1.39
1 3 6 1.12
1 4 1 2.23
1 4 2 2.01
```

3 1 3 2.13	1 4 3 1.82
3 1 4 1.78	1 4 4 2.1
3 1 5 1.31	1 4 5 1.66
3 1 6 1.3	1 4 6 1.1
3 2 1 1.52	2 1 1 2.33
3 2 2 1.47	2 1 2 2.01
3 2 3 1.8	2 1 3 1.7
3 2 4 1.37	2 1 4 1.78
3 2 5 1.01	2 1 5 1.42
3 2 6 1.31	2 1 6 1.35
3 3 1 1.55	2 2 1 1.38
3 3 2 1.61	2 2 2 1.3
3 3 3 1.82	2 2 3 1.85
3 3 4 1.56	2 2 4 1.09
3 3 5 1.23	2 2 5 1.13
3 3 6 1.13	2 2 6 1.06
3 4 1 1.56	2 3 1 1.86
3 4 2 1.72	2 3 2 1.7
3 4 3 1.99	2 3 3 1.81
3 4 4 1.55	2 3 4 1.54
3 4 5 1.51	2 3 5 1.67
3 4 6 1.33	2 3 6 0.88
; Proc Anova;Classes T S Rep;	2 4 1 2.27
Model R=T T*Rep S T*S Rep;	2 4 2 1.81
Means T S/LSD;	3 4 3 2.01
Proc Anova;Classes TS Rep;	3 4 4 1.4
Model R=TS Rep;	3 4 5 1.31
Means TS/LSD;	3 4 6 1.06
Quit;	3 1 1 1.75
	3 1 2 1.95

نتائج البيانات

The SAS System

Analysis of Variance Procedure

Class Level Information

Class	Levels	Values
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T	3	1 2 3
---	---	-------

S	4	1 2 3 4
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REP	6	1 2 3 4 5 6
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Number of observations in data set = 72

```

The SAS System
  Analysis of Variance Procedure
Dependent Variable: R
Source   DF      Sum of Squares   Mean Square   F Value   Pr > F
Model    26      2995.65207587   115.21738753    0.95    0.5401
Error    45      5431.10858940   120.69130199
Total    71      8426.76066528
Corrected
  R-Square      C.V.          Root MSE          R Mean
  0.355493     380.2284     10.985959        2.88930556

Source   DF      Anova SS      Mean Square   F Value   Pr > F
T        2      253.70051135   126.85025567    1.05    0.3580
T*REP    10     1194.59941032  119.45994103    0.99    0.4661
S        3      315.10937083   105.03645694    0.87    0.4635
T*S      6      703.02775976   117.17129329    0.97    0.4558
REP      5      529.21502361   105.84300472    0.88    0.5042
    
```

```

The SAS System
  Analysis of Variance Procedure
  T tests (LSD) for variable: R
NOTE: This test controls the type I comparisonwise error rate not
the experimentwise error rate.
Alpha= 0.05 Confidence= 0.95 df= 45 MSE= 120.6913
Critical Value of T= 2.01410
Comparisons significant at the 0.05 level are indicated by '****'.

      Lower      Difference      Upper
      Confidence Between      Confidence
      Limit      Means      Limit
1   - 2      -2.752      3.947      10.646
1   - 3      -2.149      4.007      10.162
2   - 1     -10.646     -3.947      2.752
2   - 3      -6.418      0.060      6.538
3   - 1     -10.162     -4.007      2.149
3   - 2      -6.538     -0.060      6.418
    
```

```

The SAS System
  Analysis of Variance Procedure
  T tests (LSD) for variable: R
NOTE: This test controls the type I comparisonwise error rate not
the experimentwise error rate.
Alpha= 0.05 df= 45 MSE= 120.6913
Critical Value of T= 2.01
Least Significant Difference= 7.3756
Means with the same letter are not significantly different.
    
```

T Grouping	Mean	N	S
A	6.511	18	2
A			
A	1.781	18	1
A			
A	1.691	18	4
A			
A	1.574	18	3

❖ تفسير النتائج

The SAS System

Analysis of Variance Procedure

Class Level Information

Class Levels Values

TS	12	11	12	13	14	21	22	23	24	31	32	33	34
REP	6	1	2	3	4	5	6						

Number of observations in data set = 72

The SAS System

Analysis of Variance Procedure

Dependent Variable: R

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	1801.05266556	112.56579160	0.93	0.5369
Error	55	6625.70799972	120.46741818		
Total	71	8426.76066528			

Corrected	R-Square	C.V.	Root MSE	R Mean
	0.213730	379.8755	10.975765	2.88930556

Source	DF	Anova SS	Mean Square	F Value	Pr > F
TS	11	1271.8376419	115.62160381	0.96	0.4929
REP	5	529.21502361	105.84300472	0.88	0.5016

The SAS System

Analysis of Variance Procedure

T tests (LSD) for variable: R

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 55 MSE= 120.4674

Critical Value of T= 2.00404

Comparisons significant at the 0.05 level are indicated by '****'.

The SAS System
 Analysis of Variance Procedure
 Class Level Information

Class	Levels	Values
T	3	1 2 3
S	4	1 2 3 4
REP	6	1 2 3 4 5 6

Number of observations in data set = 72

The SAS System
 Analysis of Variance Procedure
 Dependent Variable: R

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	26	2995.65207587	115.21738753	0.95	0.5401
Error	45	5431.10858940	120.69130199		
Total	71	8426.76066528			

Corrected

R-Square	C.V.	Root MSE	R Mean
0.355493	380.2284	10.985959	2.88930556

Source	DF	Anova SS	Mean Square	F Value	Pr > F
T	2	253.70051135	126.85025567	1.05	0.3580
T*REP	10	1194.59941032	119.45994103	0.99	0.4661
S	3	315.10937083	105.03645694	0.87	0.4635
T*S	6	703.02775976	117.17129329	0.97	0.4558
REP	5	529.21502361	105.84300472	0.88	0.5042

The SAS System
 Analysis of Variance Procedure
 T tests (LSD) for variable: R
 NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.
 Alpha= 0.05 Confidence= 0.95 df= 45 MSE= 120.6913
 Critical Value of T= 2.01410
 Comparisons significant at the 0.05 level are indicated by '***'.

T Comparison	Lower Confidence Limit	Difference Between Means	Upper Confidence Limit
1 - 2	-2.752	3.947	10.646
1 - 3	-2.149	4.007	10.162
2 - 1	-10.646	-3.947	2.752
2 - 3	-6.418	0.060	6.538
3 - 1	-10.162	-4.007	2.149
3 - 2	-6.538	-0.060	6.418

The SAS System
 Analysis of Variance Procedure
 T tests (LSD) for variable: R
 NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 df= 45 MSE= 120.6913

Critical Value of T= 2.01

Least Significant Difference= 7.3756

Means with the same letter are not significantly different.

T Grouping	Mean	N	S
A	6.511	18	2
A			
A	1.781	18	1
A			
A	1.691	18	4
A			
A	1.574	18	3

❖ تفسير النتائج

The SAS System
 Analysis of Variance Procedure
 Class Level Information
 Class Levels Values
 TS 12 11 12 13 14 21 22 23 24 31 32 33 34
 REP 6 1 2 3 4 5 6

Number of observations in data set = 72

The SAS System
 Analysis of Variance Procedure
 Dependent Variable: R

Source	DF	Sum of Squares	Mean Square	F Value	Pr > F
Model	16	1801.05266556	112.56579160	0.93	0.5369
Error	55	6625.70799972	120.46741818		
Total	71	8426.76066528			

Corrected

R-Square	C.V.	Root MSE	R Mean
0.213730	379.8755	10.975765	2.88930556

Source	DF	Anova SS	Mean Square	F Value	Pr > F
TS	11	1271.83764194	115.62160381	0.96	0.4929
REP	5	529.21502361	105.84300472	0.88	0.5016

The SAS System

Analysis of Variance Procedure

T tests (LSD) for variable: R

NOTE: This test controls the type I comparisonwise error rate not the experimentwise error rate.

Alpha= 0.05 Confidence= 0.95 df= 55 MSE= 120.4674

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❖ تفسير النتائج