مثال/ اجريت تجربة لدراسة تاثير ثلاثة عوامل على محصول الذرة الصفراء ، ثلاثة مستويات من عامل الري ومستوين من عامل الكثافة و صنفين من الذرة الصفراء موزعة في اربعة مكررات وباستخدام CRD .

الحل/

المعطيات : العامل الاول / مستويات الري= A

العامل الثاني / كثافتين للنبات = B

العامل الثالث / صنفين من الذرة الصفراء = C

المطلوب اثباته : ايجاد افضل مستوى من الري والكثافة النباتية والصنف الملائم .

البرهان : استخدام SAS في ايجاد CRD

❖ ادخال البيانات

```
Data TS;
Input T S C Rep R;
If T=1 and S=1 and C=1 then TSC=111;
If T=1 and S=2 and C=2 then TSC=122;
If T=1 and S=3 and C=3 then TSC=133;
If T=1 and S=4 and C=4 then TSC=144;
If T=2 and S=1 and C=1 then TSC=211;
If T=2 and S=2 and C=2 then TSC=222;
If T=2 and S=3 and C=3 then TSC=233;
If T=2 and S=4 and C=4 then TSC=244;
If T=3 and S=1 and C=1 then TSC=311;
If T=3 and S=2 and C=2 then TSC=322;
If T=3 and S=3 and C=3 then TSC=333;
If T=3 and S=4 and C=4 then TSC=344;
Cards;
1 1 1 1 8.500
1 1 1 2 9.360
1 1 1 3 7.930
1 1 1 4 14.180
1 1 2 1 4.030
1 1 2 2 9.130
1 1 2 3 10.00
1 1 2 4 7.970
1 2 1 1 7.800
1 2 1 2 5.200
1 2 1 3 8.700
1 2 1 4 12.510
1 2 2 1 7.400
1 2 2 2 7.500
1 2 2 3 3.100
1 2 2 4 11.120
2 1 1 1 9.230
2 1 1 2 8.560
2 1 1 3 8.880
2 1 1 4 11.540
2 1 2 1 8.880
```

```
2 1 2 2 6.920
2 1 2 3 8.980
2 1 2 4 8.780
2 1 1 1 6.870
2 1 1 2 7.500
2 1 1 3 9.320
2 1 1 4 11.110
2 2 2 1 6.030
2 2 2 2 10.640
2 2 2 3 10.300
2 2 2 4 5.800
3 1 1 1 7.390
3 1 1 2 8.100
3 1 1 3 9.600
3 1 1 4 11.120
3 1 2 1 6.300
3 1 2 2 6.110
3 1 2 3 4.450
3 1 2 4 13.340
3 2 1 1 8.460
3 2 1 2 8.230
3 2 1 3 8.430
3 2 1 4 12.690
3 2 2 1 4.430
3 2 2 2 7.770
3 2 2 3 7.760
3 2 2 4 7.870
; Proc Anova;Classes T S C;
Model R=T S C T*S*C;
Means T S C/Duncan;
Proc Anova;Classes TSC;
Model R=TSC;
Means TSC/Duncan;
Quit;
```

❖ نتائج البيانات

```
    The SAS System
     Analysis of Variance Procedure
     Class Level Information
     Class    Levels    Values
       T         3      1 2 3
       S         2       1 2
       C         2       1 2
       Number of observations in data set = 48
```

```
      The SAS System
      Analysis of Variance Procedure
Dependent Variable: R
Source  DF   Sum of Squares    Mean Square  F Value    Pr > F
Model   10   38.37647917       3.83764792     0.63    0.7759
Error   37   224.24311250       6.06062466
Total   47    262.61959167
Corrected
 R-Square    C.V.        Root MSE             R Mean
0.146130    29.11833      2.461833           8.45458333

Source   DF     Anova SS    Mean Square  F Value    Pr > F
T        2     1.72742917   0.86371458     0.14     0.8677
S        1     4.63260024   4.63260024     0.76    0.3876
C        1     27.90750000  27.90750000     4.60    0.0385
T*S*C    6     4.10894976   0.68482496     0.11    0.9943

     The SAS System
Analysis of Variance Procedure
Duncan's Multiple Range Test for variable: R
 NOTE: This test controls the type I comparisonwise error rate, not
the experimentwise error rate
 Alpha= 0.05  df= 37  MSE= 6.060625
  Number of Means     2     3
'  Critical Range  1.764  1.854
    Means with the same letter are not significantly different.
   Duncan Grouping       Mean      N  T
           A            8.7088     16  2
           A
           A            8.4019     16  1
           A
           A            8.2531     16  3
```

❖ تفسير النتائج

```
       The SAS System
       Analysis of Variance Procedure
        Duncan's Multiple Range Test for variable: R
  NOTE: This test controls the type I comparisonwise error rate, not
the experimentwise error rate
 Alpha= 0.05  df= 37  MSE= 6.060625
  WARNING: Cell sizes are not equal.
  Harmonic Mean of cell sizes= 23.33333
  Number of Means     2
    Critical Range  1.460
    Means with the same letter are not significantly different.
   Duncan Grouping       Mean       N  S
           A            8.7171     28  1
           A
           A            8.0870     20  2
```

```
          The SAS System
Analysis of Variance Procedure
Duncan's Multiple Range Test for variable: R
NOTE: This test controls the type I comparisonwise error rate, not
the experimentwise error rate
 Alpha= 0.05  df= 37  MSE= 6.060625
  Number of Means     2
    Critical Range  1.440
    Means with the same letter are not significantly different.
    Duncan Grouping   Mean      N  C
            A        9.2171     24  1
            B        7.6921     24  2
```

❖ تفسير النتائج

```
     The SAS System
Analysis of Variance Procedure
 Class Level Information
  Class    Levels    Values
   TSC       6    111 122 211 222 311 322
    Number of observations in data set = 48
NOTE: Due to missing values, only 28 observations can be used in
this analysis.
The SAS System
 Analysis of Variance Procedure
Dependent Variable: R
Source    DF    Sum of Squares   Mean Square  F Value    Pr > F
Model     5     29.08823750      5.81764750     1.14    0.3689
Error     22    112.22668750     5.10121307
Total     27    141.31492500
Corrected
 R-Square    C.V.                  Root MSE             R Mean
 0.205840   26.47040                2.258586           8.53250000

Source    DF     Anova SS        Mean Square  F Value    Pr > F
TSC       5      29.08823750    5.81764750     1.14    0.3689

 The SAS System
  Analysis of Variance Procedure
  Duncan's Multiple Range Test for variable: R
  NOTE: This test controls the type I comparisonwise error rate, not
th experimentwise error rate
 Alpha= 0.05  df= 22  MSE= 5.101213
  WARNING: Cell sizes are not equal.
   Harmonic Mean of cell sizes= 4.363636
    Number of Means     2     3     4     5     6
     Critical Range  3.171 3.330 3.431 3.502 3.555
```

Means with the same letter are not significantly different.

Duncan Grouping	Mean	N	TSC
A	9.993	4	111
A			
A	9.126	8	211
A			
A	9.053	4	311
A			
A	8.193	4	222
A			
A	7.280	4	122
A			
A	6.958	4	322

❖ تفسير النتائج

.