

Data analysis with MSTAT-C

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Introduction

MSTAT or MSTAT-C is a computer based Statistical software packages developed by the Crop and Soil Sciences Department of Michigan State University of the United States. The software was written by Dr. Russel Freed, Professor and Director of Crop and Soil Sciences Department of Michigan State University. This is a widely used by the researchers in the field of life science especially for the analysis of the results of scientific research.

Key features of MSTAT software

- MSTAT is a DOS (Disc Operating System) based software
- MSTAT is a handy program and does not require a rich computer
- It requires a little amount of disc spaces (Approximately 1.2 Megabytes)
- It poses an auto save system which automatically saves the putted data
- There a number of hot-keys by which any command can be forced easily with keyboard
- The input and output data files can be viewed with any word processing software (e.g. Microsoft Word)
- Output files can be directly printed

Advantages of using MSTAT software

- MSTAT is very easy to use
- In every case it asks a YES/NO confirmation
- It can analyze monovariate as well as multivariate data
- It can analyze the field data from single factor of multi factors experiment
- It can calculate the mean, standard deviation range and other dispersion value
- Probability analysis can also be done by MSTAT software
- It can calculate a complete ANOVA with probability as well as mean tales with their Coefficient of Variance
- ANOVE can be checked before analysis
- ANOVA of several parameters can be obtained at a time
- Data obtained fro any kinds of design – CRD, RCBD, Latin Square of Factorial can easily be analyzed by MSTAT-C
- Mean comparison of different factors can be performed
- Correlation and regression analysis among the parameters can also be done

Limitations of MSTAT-C

- It is a DOS-based software, so users have to have a orientation with Keyboard
- Data cannot be inserted directly from other Windows software
- If a user makes a mistake, he/she must back to the previous menu
- There have different commands for different task, which is more time consuming
- In case of mean comparison, there have to input the parameters separately for each factors and every time
- The data files should be viewed with other Word Processing software (e.g. Microsoft Word)

Steps of data analysis of experimental Design with MSTAT-C

Step-1: Opening the Program

Open the folder MSTAT-C and run the file MSTATc.exe and the first screen will be displayed. In this screen, 50 different menus will appear (1-50). Then you should select the menu 'FILES' for making a file to analyze.

Menu of the MSTAT top screen

| | | | | |
|----------------------|------------------------|------------------------|---------------------|-----------------------|
| 1. AC\$ERIE\$ | 11. CONFIG | 21. FREQ | 31. NEIGBOR | 41. \$EDIT |
| 2. ADON | 12. CONTRA\$T | 22. GROUPIT | 32. NONORTHO | 42. \$SELECT |
| 3. ANOVA-1 | 13. CORR | 23. HIERARCH | 33. NONPARAM | 43. \$ORT |
| 4. ANOVA-2 | 14. CRO\$STAB | 24. HOTELLIN | 34. PLOT | 44. \$TABIL |
| 5. ANOVALAT | 15. CURVE\$ | 25. LATIN\$Q | 35. PRINCOMP | 45. \$TAT |
| 6. A\$CII | 16. DIALLEL | 26. LP | 36. PRLI\$T | 46. TABLE\$ |
| 7. A\$EDIT | 17. ECON | 27. MEAN | 37. PROBABIL | 47. TABTRAN\$ |
| 8. BR\$ERIE\$ | 18. EXP\$ERIE\$ | 28. MI\$VALE\$T | 38. PROBIT | 48. TRAN\$PO\$ |
| 9. CALC | 19. FACTOR\$ | 29. MULTIDI\$ | 39. RANGE | 49. T-TEST |
| 10. CHI\$QR | 20. FILE\$ | 30. MULYIREG | 40. REGR | 50. VARIABLE\$ |

Step-2: Creating a file

After running the software, it should have to create a file. At first, press PATH to create a path (e.g. C:\), then go to the menu MAKE and enter the desired file name (e.g. AGRO 516), Title (Analysis) and size of entry (100).

Step-3: Data entry

Go to the SEDIT menu. At first insert the case and then define the variables. After defining the variables back to the SEDIT menu again and press on EDIT. Then enter the data.

Suppose there is an experiment with 2 factors viz. variety (V1, V2 AND V3) and nitrogen (N1, N2, N3) performed with RCBD with 3 replications. The arrangement will be as follows:

| Case | 1 Replication | 2 Variety | 3 Nitrogen | Parameter 1, 2.. |
|-------------|----------------------|------------------|-------------------|-------------------------|
| 1 | 1 | 1 | 1 | |
| 2 | 1 | 1 | 2 | |
| 3 | 1 | 1 | 3 | |
| 4 | 1 | 2 | 1 | |
| 5 | 1 | 2 | 2 | |
| 6 | 1 | 2 | 3 | |
| 7 | 1 | 3 | 1 | |
| 8 | 1 | 3 | 2 | |
| 9 | 1 | 3 | 3 | |
| 10 | 2 | 1 | 1 | |
| 11 | 2 | 1 | 2 | |
| 12 | 2 | 1 | 3 | |
| 13 | 2 | 2 | 1 | |
| 14 | 2 | 2 | 2 | |
| 15 | 2 | 2 | 3 | |
| 16 | 2 | 3 | 1 | |
| 17 | 2 | 3 | 2 | |
| 18 | 2 | 3 | 3 | |
| 19 | 3 | 1 | 1 | |
| 20 | 3 | 1 | 2 | |
| 21 | 3 | 1 | 3 | |
| 22 | 3 | 2 | 1 | |
| 23 | 3 | 2 | 2 | |
| 24 | 3 | 2 | 3 | |
| 25 | 3 | 3 | 1 | |
| 26 | 3 | 3 | 2 | |
| 27 | 3 | 3 | 3 | |

Number columns for parameter will be according to your experiments

Step-4: Analysis the design

After inputting the data go to the main menu and choose 19 FACTOR to make Analysis of Variance (ANOVA). There are 35 different design packages. Choose the desired one e.g. 8. RCBD 2 Factor (a). Then enter the ranges of variables and finish the process. Choose the group variables (except 01. REPLICATION, 02 FACTOR-1 and 03 FACTOR-2)

Step-4: Viewing the ANOVA and Mean Table

During observe the ANOVA and Mean table don't forget to note down the Error Mean Square (EMS) and Error d. f.

Step-5: Recheck the input data

After analysis again go to the SEDIT and note down the first case of factors 1, first case of factor 2 and first case of interaction. First case means where the factors again lays in same horizontal line.

Step-6: Mean Comparison

Go to the menu 'RANGE' and press P (parameter) and input values on the required field.

There several Mean separation test in MSTAT-C viz. LSD, Duncan's Multiple Range Test, Tukey's Test and Student-Newman-Keul's Test.

Means can be tested with different significant levels viz. Alpha level 0.01 (1% levels of significance), Alpha level 0.05 (5% levels of significance) and Alpha level 0.1 (10% levels of significance).

After finishing the comparison of a factor back to the field and again input the following factors.

For M.S. Students Only