Original Research Article

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Statistical Analysis Step-By-Step Using Statistical Calculator

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ABSTRACT

Keywords

Spreadsheet, Statistical
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tools

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This paper introduces a new statistical calculator which provides a step-by-step guide to data analysis of the research data generated in agriculture, biological sciences and in other fields. The process used to develop the program is quite involved with statistical theories and is not understandable to those who do not have any background in statistics and data analysis. Here we will explain the procedure adopted and the programme used, step-by-step so that it becomes easily comprehensible. We have provided examples in each spreadsheet for analysis. Data analysis with this statistical programme is not really difficult. According to the draft format required for analysis, you only need to arrange and enter the raw data. It does not require much information and knowledge about the formula used as well as the program developed to analyze the data.

Introduction

Any computer that has Microsoft Office Excel in it can operate this statistical calculator.

Operating system requirement is windows7 or its higher version. Usually looking at a data we become nervous and start thinking that how to analyse the data using computer programme, how to write the report of the research analysis etc. This newly developed statistical calculator will remove the fear of data analysis and make our life easy. This calculator will get the data analysis done within a very reasonable computing time.

Materials and Methods

We follow the steps described below to get the data analyzed and finding its outputs:

Step 1: Type www.sbear.in in any browser that will open the following web page

Step 2: Then click on Statistical Analysis which will open the page given below

Step 3: There are number of items on the statistical calculator. You can click on any one of them according to your need, for example, click on Descriptive Statistics

Step 4: Then click on Statistical Calculator, it will download the statistical calculator of Descriptive Statistics within a second. You can keep it in your computer or laptop forever. Next, you click on the downloaded file, which is an excel file, then a data spreadsheet will open up. Here you can analyse upto 6 number of variables with 46 observations each. Now you can put your data directly in the given

spreadsheet or copy from other sheet and paste it on the spreadsheet

Step 5: Now you click on print command and then that command will start the analysis of data and produces results in a printable format. If a printer is attached to the computer, then you can take a print out of the results. Otherwise, you can see your results in a print preview mode and the following page will open up:

Same process will have to apply for all other statistical calculator like correlation coefficient, completely randomized design, randomized block design, factorial experiment etc.

Other data analysis tools

Correlation coefficient

Step 1: Click on correlation coefficient and the following page will show up:

Step 2: Then click on correlation coefficient, then that will download the statistical calculator of correlation coefficient within a second. You can keep it in your computer or laptop forever. Next, you click on the downloaded file which is an excel file, a data spreadsheet will open up.

Here you can analyse upto 11 number of variables with 46 observations each. Now you can enter your data directly in the given spreadsheet or copy from other sheet and paste it on the spreadsheet.

Step 3: Now, you click on print command, then that command will start analysis of the data and produces the results in a printable format. If a printer is attached to the computer, then you can take a print out of the results. Otherwise, you can see your results in a print preview mode and the following will come up:

Completely randomized design

Step 1: Click on completely randomized design

Step 2: Here you will get two statistical calculators, one for equal number of replications and other for unequal number of replications. Then click on any one them according to your requirement and then that command will download the statistical calculator of completely randomized design within a second. You can keep it in your computer or laptop forever. Next, you click on the downloaded file which is an excel file, a data spreadsheet will open up. Here you can analyse upto 30 number of treatments with upto 6 number of replications. Now you can put your data directly in the given spreadsheet or copy from other sheet and paste it here.

Step 3: Put Number of Replications = 4, Number of Treatments = 5 and Name of the Variable = yield of wheat in the following page.

Step 4: Now you click on print command, then that command will start analysis of the data and produces the results in a printable format. If a printer is attached to the computer, then you can take a print out of the result, otherwise, you can see your result in a print preview mode. See the page below:

Randomized block design

Step 1: Click on the Randomized block design

Step 2: Next, after clicking on randomized block design, it will download the statistical calculator for randomized block design within a second. You can keep it in your computer or laptop forever. After that, you click on the downloaded file which is an excel file, then a data spreadsheet will open up. Here you can analyse upto 30 number of treatments with upto 6 number of replications. Now you can enter your data directly in the given spreadsheet or copy from other sheet and paste it here.

The steps described below to get the data analyzed and finding its outputs

Variables ->	V1	V2	V3	V4	V5	V6
Obs.1	4.51	0.14	12.7	47.7	20.5	22
Obs.2	5.33	0.2	13.6	58.2	54.8	49
Obs.3	4.82	0.17	13.14	52.3	36.4	38
Obs.4	4.32	0.12	12.6	49.6	17.8	31
Obs.5	4.64	0.25	13.2	57	42	46.2
Obs.6	4.5	0.16	12.84	53.4	31	41.2
Obs.7	4.11	0.15	12	50.4	19.5	26.5
Obs.8	4.64	0.25	12.8	56	55.4	44.4
Obs.9	4.5	0.2	12.32	53	40.4	35.3
Obs.10	4.57	0.1	10.7	49.6	18.4	27.1
Obs.11	5.24	0.25	12.9	53.5	42.4	51.5
Obs.12	4.81	0.17	11.92	51.5	31.1	41.2
Obs.13	4.70-	0.15	11.3	49.6	22	29.2
Obs.14	5.48	0.2	11.8	54.4	56	57
Obs.15	4.94	0.17	11.54	51.7	36.2	42.6
Obs.16						
Obs.17						
Obs.18						
Obs.19						
Obs.20						

Example.1 Find the descriptive statistics for the following data

V ₁ = pH	V ₂ = EC	V ₃ =CEC	V ₄ =Porosity	V ₅ =Sand	V ₆ =Silt
4.51	0.14	12.7	47.7	20.5	22
5.33	0.2	13.6	58.2	54.8	49
4.82	0.17	13.14	52.3	36.4	38
4.32	0.12	12.6	49.6	17.8	31
4.64	0.25	13.2	57	42	46.2
4.5	0.16	12.84	53.4	31	41.2
4.11	0.15	12	50.4	19.5	26.5
4.64	0.25	12.8	56	55.4	44.4
4.5	0.2	12.32	53	40.4	35.3
4.57	0.1	10.7	49.6	18.4	27.1
5.24	0.25	12.9	53.5	42.4	51.5
4.81	0.17	11.92	51.5	31.1	41.2
4.70-	0.15	11.3	49.6	22	29.2
5.48	0.2	11.8	54.4	56	57
4.94	0.17	11.54	51.7	36.2	42.6

After copy pasting the data it will look like the following page:

Output

Descriptive Statistics	Variable					
	V1	V2	V3	V4	V5	V6
Moments						
Mean	4.74	0.18	12.36	52.53	34.93	38.81
Mode	4.64	0.20	NA	49.60	NA	41.20
Median	4.64	0.17	12.60	52.30	36.20	41.20
Standard Deviation	0.39	0.05	0.80	2.99	13.65	10.16
Sample Variance	0.15	0.00	0.64	8.93	186.25	103.21
Kurtosis	-0.28	-0.60	-0.30	-0.49	-1.16	-0.84
Skewness	0.53	0.26	-0.51	0.38	0.27	0.01
Range	1.37	0.15	2.9	10.5	38.2	35
Sum	66.41	2.68	185.36	787.9	523.9	582.2
Count	14	15	15	15	15	15
CV	8.24	25.90	6.46	5.69	39.07	26.17
upper 95% mean	4.95	0.20	12.76	54.03	41.80	43.93
lower 95% mean	4.54	0.16	11.95	51.01	28.02	33.67
Quartiles						
Max	5.48	0.25	13.6	58.2	56	57
3rd quartile	4.91	0.20	12.87	53.95	42.20	45.30
2nd quartile	4.64	0.17	12.60	52.30	36.20	41.20
1st quartile	4.50	0.15	11.86	50.00	21.25	30.10
Min	4.11	0.1	10.7	47.7	17.8	22
Standard Errors						
S E of Mean	0.104	0.012	0.206	0.772	3.524	2.623
S E of Skewness	0.597	0.580	0.580	0.580	0.580	0.580
S E of Kurtosis	1.154	1.121	1.121	1.121	1.121	1.121
Z value of Skew	0.886	0.453	-0.885	0.657	0.461	0.019
Z value of Kurtosis	-0.246	-0.536	-0.266	-0.435	-1.033	-0.745
	ND	ND	ND	ND	ND	ND
ND - Normally Distributed; NND - Not Normally Distributed						

Other Data Analysis Tools

Correlation Coefficient (2) [Compatibility Mode] - Microsoft Excel

Developed by: Dr D S DHAKRE, Dept of EES, Visva-Bharati

Variables	V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
Obs.1	4.51	0.14	12.7	47.7	20.5	22	18.2	10.57	0.68	298	6
Obs.2	5.33	0.2	13.6	58.2	54.8	49	35.2	15.7	1.44	341.3	8.1
Obs.3	4.82	0.17	13.14	52.3	36.4	38	25.4	12.44	1.1	314.4	6.7
Obs.4	4.32	0.12	12.6	49.6	17.8	31	24.5	11.15	0.92	278.6	7.7
Obs.5	4.64	0.25	13.2	57	42	46.2	36	14.6	2.04	333	9.8
Obs.6	4.5	0.16	12.84	53.4	31	41.2	27.7	12.5	1.32	305.9	8.85
Obs.7	4.11	0.15	12	50.4	19.5	26.5	16	11.79	0.85	380	6.3
Obs.8	4.64	0.25	12.8	56	55.4	44.4	36.1	14.2	1.92	403.5	8
Obs.9	4.5	0.2	12.32	53	40.4	35.3	24.1	12.42	1.24	390.8	7.1
Obs.10	4.57	0.1	10.7	49.6	18.4	27.1	22	10.55	0.77	341.2	7.7
Obs.11	5.24	0.25	12.9	53.5	42.4	51.5	30.5	13.98	1.4	390.6	10
Obs.12	4.81	0.17	11.92	51.5	31.1	41.2	27.6	12.2	1.04	365.1	8.34
Obs.13	4.70	0.15	11.3	49.6	22	29.2	14.5	9	0.81	327.8	7.9
Obs.14	5.48	0.2	11.8	54.4	56	57	29.1	13.39	1.91	370.5	11.7
Obs.15	4.94	0.17	11.54	51.7	36.2	42.6	21	10.8	1.22	342.5	9.12
Obs.16											
Obs.17											
Obs.18											

Example.2 Find the correlation coefficient and its significance for the following data

V ₁ =pH	V ₂ =EC	V ₃ =CEC	V ₄ =Porosity	V ₅ =Sand	V ₆ =Silt	V ₇ =clay	V ₈ =LR	V ₉ =OC	V ₁₀ =N	V ₁₁ =P
4.51	0.14	12.7	47.7	20.5	22	18.2	10.57	0.68	298	6
5.33	0.2	13.6	58.2	54.8	49	35.2	15.7	1.44	341.3	8.1
4.82	0.17	13.14	52.3	36.4	38	25.4	12.44	1.1	314.4	6.7
4.32	0.12	12.6	49.6	17.8	31	24.5	11.15	0.92	278.6	7.7
4.64	0.25	13.2	57	42	46.2	36	14.6	2.04	333	9.8
4.5	0.16	12.84	53.4	31	41.2	27.7	12.5	1.32	305.9	8.85
4.11	0.15	12	50.4	19.5	26.5	16	11.79	0.85	380	6.3
4.64	0.25	12.8	56	55.4	44.4	36.1	14.2	1.92	403.5	8
4.5	0.2	12.32	53	40.4	35.3	24.1	12.42	1.24	390.8	7.1
4.57	0.1	10.7	49.6	18.4	27.1	22	10.55	0.77	341.2	7.7
5.24	0.25	12.9	53.5	42.4	51.5	30.5	13.98	1.4	390.6	10
4.81	0.17	11.92	51.5	31.1	41.2	27.6	12.2	1.04	365.1	8.34
4.70-	0.15	11.3	49.6	22	29.2	14.5	9	0.81	327.8	7.9
5.48	0.2	11.8	54.4	56	57	29.1	13.39	1.91	370.5	11.7
4.94	0.17	11.54	51.7	36.2	42.6	21	10.8	1.22	342.5	9.12

Output

Variables		V1	V2	V3	V4	V5	V6	V7	V8	V9	V10	V11
V1	r	1	0.462	0.140	0.528	0.735	0.822	0.510	0.535	0.491	0.251	0.688
	sig				*	**	**		*			**
	p-value		0.082	0.619	0.042	0.002	0.000	0.051	0.039	0.062	0.366	0.004
	N		15	15	15	15	15	15	15	15	15	15
V2	r		1	0.547	0.797	0.820	0.749	0.741	0.779	0.844	0.595	0.497
	sig			*	**	**	**	**	**	**	*	
	p-value			0.034	0.000	0.000	0.001	0.001	0.001	0.000	0.018	0.058
	N			15	15	15	15	15	15	15	15	15
V3	r			1	0.585	0.453	0.360	0.627	0.720	0.426	-0.120	-0.031
	sig				*			*	**			
	p-value				0.021	0.088	0.185	0.012	0.002	0.112	0.671	0.913
	N				15	15	15	15	15	15	15	15
V4	r				1	0.881	0.810	0.883	0.917	0.873	0.388	0.509
	sig					**	**	**	**	**		
	p-value					0.000	0.000	0.000	0.000	0.000	0.151	0.051
	N					15	15	15	15	15	15	15
V5	r					1	0.874	0.789	0.817	0.865	0.528	0.569
	sig						**	**	**	**	*	*
	p-value						0.000	0.000	0.000	0.000	0.042	0.026
	N						15	15	15	15	15	15
V6	r						1	0.774	0.758	0.840	0.404	0.837
	sig							**	**	**		**
	p-value							0.001	0.001	0.000	0.134	0.000
	N							15	15	15	15	15
V7	r							1	0.908	0.837	0.268	0.510
	sig								**	**		
	p-value								0.000	0.000	0.333	0.051
	N								15	15	15	15
V8	r								1	0.787	0.398	0.405
	sig									**		
	p-value									0.000	0.140	0.133
	N									15	15	15
V9	r									1	0.414	0.703
	sig											**
	p-value										0.123	0.003
	N										15	15
V10	r										1	0.239
	sig											
	p-value											0.389
	N											15
V11												1
** correlation is significant at the 0.01 level						* correlation is significant at the 0.05 level						

Completely Randomized Design

Example.3 The following table gives the yields in pound per plot, of five varieties of wheat after being applied to each of 4 plots, tested in a Completely Randomized Design. Carry out the analysis of analysis of a Completely Randomized Design for data.

Varieties	Replications			
A	8	8	6	10
B	10	12	13	9
C	18	17	13	16
D	12	10	15	11
E	8	11	9	8

Output

Randomized Block Desing

SBEAR, Santiniketan x Statistical Calculator x +

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Statistical Calculator

Dr. D.S. Dhakre

Descriptive Statistics

Test of Significance

Correlation

Regression

Completely Randomized Design

Randomized Block Design

Latin Square Design

Factorial RCB Design

Factorial Experiment with Extra Treatments

Split Plot Design

Strip Plot Desing

Pooled Analysis

Heritability

Randomized Block Design (RBD)

Number of Treatments max 30

Number of Replications max 6

Analysis Procedure

⇒ Download the file in your PC.

⇒ Open downloaded file.

⇒ Select and copy your data from your file and paste it in the downloaded file.

⇒ Give the print command, only result will print on the paper.

Statistical Calculator

Windows taskbar: 22:12 05-10-2018

[illegible][illegible]

Example.4 The following table gives the yields in pound per plot of five varieties of wheat after being applied to each of 4 plots, tested in a Randomized block design. Carry out the analysis of a Randomized block design for data

Varities	Replications			
A	8	8	6	10
B	10	12	13	9
C	18	17	13	16
D	12	10	15	11
E	8	11	9	8

Output

Heritability

Heritability

Developed by: Dr D S DHAKRE, Dept of EES, Visva-Bharati

No. of Replications: 4

No. of Treatments: 8

Character Name: number of ears per plant

Treatment	R1	R2	R3	R4	R5	R6
T1	50.2	41.4	36.2	39.8		
T2	41.8	47.2	39.6	46.6		
T3	39.2	37.6	38.8	33.6		
T4	37.8	49.6	35.4	41.8		
T5	35.6	31.4	33.2	29.8		
T6	53.4	50.2	49.6	57.8		
T7	43.8	46.8	41.4	43.6		
T8	50.6	47.8	41.8	46.8		

Example.5 In a replicated trial ($r=4$), eight varieties of barley were tested (Chaudhary, 1973) and the observations were recorded on number of ears per plant. Carry out the Heritability and genetic advance for data

Varieties	Replications			
1	50.2	41.4	36.2	39.8
2	41.8	47.2	39.6	46.6
3	39.2	37.6	38.8	33.6
4	37.8	49.6	35.4	41.8
5	35.6	31.4	33.2	29.8
6	53.4	50.2	49.6	57.8
7	43.8	46.8	41.4	43.6
8	50.6	47.8	41.8	46.8

Output

ANOVA for number of ears per plant						Treatment	Mean
Source of variation	DF	SS	MS	F- value	p-value	T1	41.90
Treatments	7	1023.99	146.28	10.60	0.000**	T2	43.80
Replications	3	109.22	36.41	2.64	0.076	T3	37.30
Error	21	289.75	13.80			T4	41.15
** Significant at the 0.01 level						T5	32.50
Grand total						T6	52.75
SE(m)						T7	43.90
SE(d)						T8	46.75
Critical Difference							
Root MSE							3.71
Grand Mean							42.51
Coefficient Variation							8.74%
R Square							0.80

Environment variance 13.80

Genotypic variance 33.12

Phenotypic variance 46.92

Phenotypic Coefficient of Variation (PCV) 16.11%

Genotypic Coefficient of Variation (GCV) 13.54%

Heritability (h^2)= 70.59%

Genetic Advance (GA) at 1% 12.8

Genetic Advance (GA) at 5% 10.0

Genetic Advance (GA) at 10% 8.5

Genetic Advance as percentage over Mean (GAM) 1% 30.03%

Genetic Advance as percentage over Mean (GAM) 5% 23.43%

Genetic Advance as percentage over Mean (GAM) 10% 20.02%

Max 29.80

Min 57.80

Range 28.00

Pooled Analysis

The screenshot shows a web browser window with the URL www.sbear.in/pooled.html. The page title is "Statistical Calculator" by Dr. D. S. Dhakre. The interface is divided into two main sections: a list of statistical tests on the left and a "Pooled Analysis" section on the right.

Statistical Calculator
Dr. D. S. Dhakre

Descriptive Statistics
Test of Significance
Correlation
Regression
Completely Randomized Design
Randomized Block Design
Latin Square Design
Factorial RCB Design
Factorial Experiment with Extra Treatments
Split Plot Design
Strip Plot Design
Pooled Analysis
Heritability

Pooled Analysis
Number of Treatments max 23
Number of Replications max 6
(Locations / Seasons / Years) max 6

Replications and Treatments Should be same for all Locations or Seasons or Years

Analysis Procedure
⇒ Download the file in your PC.
⇒ Open downloaded file.
⇒ Select and copy your data from your file and paste it in the downloaded file.
⇒ Give the print command; only result will print on the paper.(Result is on the second Sheet)

Statistical Calculator

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Example.6 An experiment was conducted in RBD in three locations with eight varieties and four replications. The data regarding yield of wheat (Kg./plot) are given below in table. Analyze the data and draw your conclusions

		LOCATION-1		
variety	R1	R2	R3	R4
1	7.5	8.2	5.3	8.4
2	24.8	23.65	24.3	24.8
3	35	33.5	34.75	34
4	31.4	30	30.8	34.8
5	36	35.8	36.2	35.5
6	37.85	40	39.2	38.8
7	34.8	33.2	33	31.9
8	37.8	37.2	38.5	35.8
		LOCATION-2		
variety	R1	R2	R3	R4
1	6.9	8	7.5	8.65
2	25.3	22.8	22.85	25.3
3	33.85	35	35.3	32.8
4	32.6	28.5	31.9	34.6
5	34.9	36.1	37.3	36
6	39	38.9	40.2	39.15
7	33.2	36	32.8	33.3
8	36.8	34.1	37.9	37
		LOCATION-3		
variety	R1	R2	R3	R4
1	19.2	17.4	16	13.85
2	25.6	27.35	23.45	26.2
3	30.7	34.75	35.2	33.6
4	29.8	32	29.65	32.1
5	35.4	35.75	36.5	37.3
6	39.8	39.45	38.2	42.45
7	36.8	35.6	37.2	37.6
8	37.15	36.85	37.3	37.95

Output

	ANOVA for	LOCATION-1				
Source	DF	SS	MS	F- value	p-value	
TREATMENTS	7	2975.24	425.03	282.53**	0.00	
REPLICATIONS	3	1.06	0.35	0.24	0.87	
ERROR	21	31.59	1.50			
TOTAL	31	3007.90				
	Grand total =	972.75		Root MSE =		1.23
	S E (d) =	0.87		Grand Mean =		30.40
	Critical Difference =	1.80		C V =		4.03%
	R Square =	0.99		S E(m)=		0.61
	ANOVA for	LOCATION-2				
Source	DF	SS	MS	F- value	p-value	
TREATMENTS	7	2918.18	416.88	193.18**	0.00	
REPLICATIONS	3	4.20	1.40	0.65	0.59	
ERROR	21	45.32	2.16			
TOTAL	31	2967.70				
	Grand total =	974.50		Root MSE =		1.47
	S E (d) =	1.04		Grand Mean =		30.45
	Critical Difference =	2.16		C V =		4.82%
	R Square =	0.98		S E(m)=		0.73
	ANOVA for	LOCATION-3				
Source	DF	SS	MS	F- value	p-value	
TREATMENTS	7	1653.85	236.26	97.86**	0.00	
REPLICATIONS	3	4.97	1.66	0.69	0.57	
ERROR	21	50.70	2.41			
TOTAL	31	1709.519297				
	Grand total =	1028.15		Root MSE =		1.55
	S E (d) =	1.10		Grand Mean =		32.13
	Critical Difference =	2.28		C V =		4.84%
	R Square =	0.97		S E(m)=		0.78
	Location's	df	MSE			
	L1	21	1.50			
	L2	21	2.16			
	L3	21	2.41			

According to Hartley's test the Variances are equal; It means MSEs are homogeneous						
If MSEs are heterogeneous, then we use Aitken's Transformation to the data for pooled analysis						
Combined block design of experiment and ANOVA table with transformation						
SOURCE	DF	SS	MS	Fcal	p-value	
TREATMENTS	7	3808.95	544.14	544.14 **	0.00	
LOCATIONS	2	355.11	177.55	177.55 **	0.00	
REP in loc	9	4.71	0.52	0.52		
treat*loc	14	206.06	14.72	14.72 **	0.00	
ERROR	63	63.00	1.00			
TOTAL	95	4437.83				
	SE	CD			GM=	22.06
Location	0.25	0.50			CV=	4.53
Treatment	0.41	0.82			Root MSE	1
TRT*Loc	0.71	1.41			R Square =	0.99
combined block design experiment ANOVA table without transformation						
SOURCE	DF	SS	MS	Fcal	p-value	
TREATMENTS	7	7347.12	1049.59	518.17 **	0.00	
LOCATIONS	2	61.98	30.99	15.30 **	0.00	
REP in loc	9	10.23	1.14	0.56		
treat*loc	14	200.16	14.30	7.06 **	0.00	
ERROR	63	127.61	2.03			
TOTAL	95	7747.10				
	SE	CD			GM=	30.99
Location	0.36	0.71			CV=	4.59
Treatment	0.58	1.16			Root MSE=	1.42
TRT*Loc	1.01	2.01			R Square =	0.98

** Significant at the 0.01 level

Treatment	Mean (Original)	Mean (Transformation)
T1	10.58	7.32
T2	24.70	17.59
T3	34.04	24.29
T4	31.51	22.49
T5	36.06	25.71
T6	39.42	28.08
T7	34.62	24.60
T8	37.03	26.42
L1	30.40	24.78
L2	30.45	20.73
L3	32.13	20.68

Step 3: Put Number of Replications =4, Number of Treatments =5 and Name of the Variable = yield of wheat in the following page.

Step 4: Now you click on print command and then that command will start analysis and produces the results in a printable format. If a printer is attached to computer, then you can take a print out of the results. Otherwise, you can see your result in a print preview mode. See the page below:

Heritability

Step 1: Click on the item Heritability:

Step 2: Then click on Statistical Calculator and then that will download the statistical calculator of Heritability within a second. You can keep it in your computer or laptop forever. Next, you click on the downloaded file which is an excel file, a data spreadsheet will open up. Here you can analyse upto 23 number of treatments with upto 6 number of replications. Now you can enter your data directly in the given spreadsheet or copy from other sheet and paste it here.

Step 3: Put Number of Replications =4, Number of Treatments =8 and Name of the Variable = number of ears per plant in the following page.

Step 4: Now you click on the print command, then that command will start analysis and produces the results in a printable format. If a printer is attached to computer then you can take a print out of the results. Otherwise, you can see your result in a print preview mode. See the page below:

Pooled analysis

Step 1: Click on Pooled Analysis items of the calculator

Step 2: Click on Statistical Calculator of pooled analysis, then that page will download the calculator within a second. You can keep it in your computer or laptop forever. Next, you click on the downloaded file which is an excel file and a data spreadsheet will open up. Here you can analyse upto 23 number of treatments, upto 6 number of replications and upto 6 number of Location / Year / Season. Now you can put your data directly in the given spreadsheet or copy from other sheet and paste it here.

Step 3: Put Number of Replications =4, Number of Treatments=8, Number of Location =3 and Name of Location= Location 1, Location 2, Location 3 in the following page.

Step 4: Now you click on print command and that will start analysis and produces the results in a printable format. If a printer is attached to computer, then you can take a print out of the results. Otherwise, you can see your result in a print preview mode. See the page below:

The steps described in the statistical calculator are easy to follow and one will not have any difficulty in getting his/her data analysis done without much effort. Interpretation of the output, which is a very important but a shadow area in any analysis of data using software packages, has been made clear for the users. This newly developed statistical calculator will definitely remove the inhibition of the researchers in data analysis using appropriate statistical tools and techniques. The calculator can further be extended by incorporating more items in the calculator which will be our further research endeavour.

References

A Hand Book of Agricultural Statistics, S. R. S. Chandel, Achal Prakashan Mandir,

Kanpur.
Biometrical Methods in Quantitative Genetic
Analysis, R.K. Singh and B. D.
Chaudhary, Kalyani Publishers.
Microsoft Excel-Microsoft Corporations, One

Microsoft Way Redmond, WA 98052-
6399
Statistics Theory and Practice, D.
Bhattacharya and S. Roy Chowdhury,
U. N. Dhur & Sons.

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