University School of Business

Lab Manual

On

Subject Name: SPSS
Subject Code: BAP-657

Dr. Atul Shiva

Vision and Mission of the Department

Vision of the Department

To create excellence in business management for nurturing value driven business leaders with analytical and entrepreneurial mindset to foster innovative ideas in order to transform the world and serve the society.

Mission Statements of the Department

M1 : Design a unique competency directed and industry relevant curriculum with outcome oriented teaching learning process facilitated by world class infrastructure.

M2 : Enhance students' cognitive, research, analytical, ethical and behavioral competencies through programs that equip them to meet global business challenges in the professional world.

M3 : Facilitate student centric sound academic environment with co-curricular and extra-curricular activities to groom and develop future ready business professionals.

M4 : Design a transparent evaluation system for objective assessment of the program learning.

M5 : Align meaningful interactions with the academia, industry and community to facilitate value driven holistic development of the students.

M6 : Develop ethical and socially responsible entrepreneurial attitude for harnessing the environmental opportunities through creativity and innovation for a vibrant and sustainable society.

Program Educational Objectives (PEOs)

Program Educational Objectives (PEOs) are the broad statements that describe career and professional accomplishments that graduates will attain within a few years of graduation. After successful completion of MBA program from Chandigarh University, the graduates will:

PEO1: Make significant impact as successful management professionals with a sound business and entrepreneurial acumen leading to a promising career in the various management domains.

PEO 2: Develop the professional competence for astute decision making, organization skills, planning and its efficient implementation, research, data analysis and interpretation with a solution finding approach.

PEO 3: Be known for their team player qualities to handle diversity and the leadership skills to make sound decisions while working with peers in an inter-disciplinary environment with people of cross-cultural attributes

PEO 4: Be adaptable to new technology, innovations and changes in world economy that positively impacts and contributes towards industry, academia and the community at large.

PEO 5: Be responsible citizens with high ethical conduct that will empower the business organizations with high integrity, moral values, social effectiveness and legal business intelligence.

Program Outcomes (POs)

Program Outcome	After completing the program, the students will be able to:
PO1	Apply knowledge of management theories and practices to solve business problems.
PO2	Foster Analytical and critical thinking abilities for data-based decision making
PO3	Ability to develop Value based Leadership ability
PO4	Ability to understand, analyze and communicate global, economic, legal, and ethical aspects of business.
PO5	Ability to lead themselves and others in the achievement of organizational goals, contributing effectively to a team environment.
PO6	Ability to develop innovative and entrepreneurial mindset.

S.No.	Event	Date From	Date To	Working days	Remarks/Displayed on
	Academic Calendar for the Year 2019-20				
	Odd Semester				
1	**Start of semester**	**15th July 2019**			
2	**First fortnight**	**15-Jul-19**	**26-Jul-19**	**10**	**26-Jul-19**
3	**Second Fortnight**	**29-Jul-19**	**14-Aug-19**	**12**	**14-Aug-19**
4	Assignments	**24-Jul-19**	**13-Aug-19**		**Unit I**
5	**1st Hourly Test**	**16-Aug-19**	**19-Aug-19**	**3**	
6	**Third Fortnight**	**20-Aug-19**	**30-Aug-19**	**9**	**30-Aug-19**
7	**Forth Fortnight**	**03-Sep-19**	**13-Sep-19**	**9**	**13-Sep-19**
8	**Fifth Fortnight**	**16-Sep-19**	**26-Sep-19**	**8**	**26-Sep-19**
9	**Fresher Party 2018**	**20-Sep-19**			
10	Assignments	**27-Aug-19**	**23-Sep-19**		**Unit II**
12	**2nd Hourly Test**	**27-Sep-19**	**30-Sep-19**	**3**	
13	**Sixth Fortnight**	**01-Oct-19**	**11-Oct-19**	**7**	**11-Oct-19**
14	**Entrecellance -18**	**18-Oct-19**			
15	**Seventh Fortnight**	**14-Oct-19**	**24-Oct-19**	**9**	**24-Oct-19**
16	**Diwali holidays**	**25-Oct-19**	**29-Oct-19**	**5**	
17	Assignments	**22-Oct-19**	**11-Nov-19**		**Unit III**
18	**Eight Fortnight**	**30-Oct-19**	**13-Nov-19**	**6**	**13-Nov-19**
19	**Student's Day**	**02-Nov-19**		**Student-Teacher Interaction**	
20	**Online Quiz**	**14-Nov-19**	**15-Nov-19**	**2**	
21	**Practical Exams**	**18-Nov-19**	**21-Nov-19**	**4**	
22	**Theory Examination**	**22-Nov-19**	**20-Dec-19**	**21**	
23	**Winter Vacations**	**23-Dec-19**	**05-Jan-20**	**14**	**Students**
24	**Winter Vacations**	**25-Dec-19**	**01-Jan-20**	**7**	**Faculty**
25	**Next semester**	**02-Jan-20**			

Note :- Diwali Holidays from 25th Oct 2019 to 29th Oct 2019

Prof. Gurdip Singh
Executive Director

Contents of Lab Manual

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S. No.	ITEM	Annexure/Page no.
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	University School of Business CHANDIGARH UNIVERSITY, GHARUAN

(Batch 2018-2020)
Version-2018

University School Business,
CHANDIGARH UNIVERSITY, GHARUAN

Scheme of MBA BATCH (2018-2020)	Total Credits=106

Ist Semester

Subject Code	Subjects	L	T	P	Cr
BAT- 601	Accounting for Managers	4	0	0	4
BAT- 602	Fundamentals of Management and Organizational Behaviour	4	0	0	4
BAT- 603	Managerial Economics	4	0	0	4
BAT- 604	Quantitative Techniques for Managers	4	0	0	4
BAT- 605	Marketing Management	3	0	0	3
PCT-610	Professional Business Communication	3	0	0	3
PCP-611	Professional Business Communication (LAB)	0	0	2	1
BAT- 608	Computer Applications for Business	2	0	2	3
BAT- 609	Supply Chain Management	3	0	0	3
	TOTAL CREDITS IN SEMESTER				**29**
	Mentoring Lectures	2	0	0	0
	TOTAL NO. OF SESSIONS				**33**

IInd Semester

Subject Code	Subjects	L	T	P	Cr
BAT- 660	Legal and Business Environment	3	0	0	3
BAT- 661	Corporate Finance	4	0	0	4
BAT- 662	Operations Management and Research	4	0	0	4
BAT- 654	Research Methodology	4	0	0	4
BAT- 655	Social Media and Digital Marketing	3	0	0	3
BAT- 656	Human Resource Management	3	0	0	3

BAP- 657	Introduction to SPSS	0	0	4	2
	TOTAL CREDITS IN SEMESTER				**23**
	TOTAL NO. OF SESSIONS				**25**
	TOTAL NO. OF SESSIONS (8 SESSIONS/WEEK TO TPP + 2 sessions of Mentoring)				**35**
IN ADDITION TO COMPOULSORY SUBJECTS, A STUDENT HAS TO CHOOSE TWO SUBJECTS FROM EACH OPTED SPECIALISATION				
	IIIrd Semester				
BAT- 731	Retail Management	3	0	0	3
BAT- 732	Corporate Strategy	3	0	0	3
BAP- 703	Predictive Analysis	0	0	4	2
	SPECIALISATION (MARKETING, HR, FINANCE & INTERNATIONAL BUSINESS)				
	Specialisation Group A/B/C/D/E: Elective I	4	0	0	4
	Specialisation Group A/B/C/D/E: Elective II	4	0	0	4
	Specialisation Group A/B/C/D/E: Elective III	4	0	0	4
	Specialisation Group A/B/C/D/E: Elective IV	4	0	0	4
BAI- 705	Summer Training Report	0	0	0	4
	TOTAL CREDITS IN SEMESTER				**28**
	TOTAL NO. OF SESSIONS				**26**
	TOTAL NO. OF SESSIONS (8 SESSIONS/WEEK TO TPP + 1 sessions of Mentoring)				**35**
	AFTER THIRD SEMESTER, A STUDENT HAS TO CHOOSE TWO SUBJECTS FROM ONE SPECIALISATION				
	IVth Semester				
BAT- 780	Corporate Social Responsibility and Sustainability	3	0	0	3
BAT- 781	Indian Ethos and Business Ethics	3	0	0	3
	SPECIALISATION (ENTREPRENEURSHIP & INTERNATIONAL BUSINESS)				
	Specialisation Group A/B/C/D/E: Elective I	4	0	0	4
	Specialisation Group A/B/C/D/E: Elective II	4	0	0	4
	Specialisation Group A/B/C/D/E: Elective III	4	0	0	4
	Specialisation Group A/B/C/D/E: Elective IV	4	0	0	4
BAR- 752	Final Research Project and Publications	0	0	0	4
	TOTAL CREDITS IN SEMESTER				**26**
	TOTAL NO. OF SESSIONS				**22**

Final Resreach Project & Publications- **Students are required to conduct Research Project Survey under the supervision of Assigned Supervisor (Faculty). In this regard, each faculty member will be assigned 4 groups (each group contains 5 students) and each Group has to publish two Research Paper from their research project work in UGC listed Journal. Each published Research Paper will carry 2 credits.**

FINANCE (A)					
SPECIALIZATIONS (Semester-3)					
BAA-735	Investment Analysis and Portfolio Management	4	0	0	4
BAA-736	Managing Banks and Financial Institutions	4	0	0	4

	SPECIALIZATIONS (Semester-4)				
BAA-785	Financial Markets and Services	4	0	0	4
BAA-786	Taxation	4	0	0	4
	MARKETING (B)				
	SPECIALIZATIONS (Semester-3)				
BAB-711	Consumer Behaviour	4	0	0	4
BAB-749	Rural Marketing	4	0	0	4
	SPECIALIZATIONS (Semester-4)				
BAB-787	Sales and Distribution Management	4	0	0	4
BAB-788	Services Marketing	4	0	0	4
	HUMAN RESOURCE MANAGEMENT (C)				
	SPECIALIZATIONS (Semester-3)				
BAC-741	Compensation and Benefits Management	4	0	0	4
BAC-742	Strategic HRM	4	0	0	4
	SPECIALIZATIONS (Semester-4)				
BAC-789	Cross Cultural Management	4	0	0	4
BAC-790	Employee Relations	4	0	0	4
	INTERNATIONAL BUSINESS (D)				
	SPECIALIZATIONS (Semester-3)				
BAD-743	Export Import Documentation	4	0	0	4
BAD-745	International Trade and Laws	4	0	0	4
	SPECIALIZATIONS (Semester-4)				
BAD-791	Globalisation and Indian Multinational Companies	4	0	0	4
BAD-792	International Marketing	4	0	0	4
	ENTREPRENEURSHIP (E)				
	SPECIALIZATIONS (Semester-3)				
BAE-746	Entrepreneurial Strategies-I	4	0	0	4
BAE-747	Social Entrepreneurship	4	0	0	4
	SPECIALIZATIONS (Semester-4)				
BAE-793	Entrepreneurial Strategies-II	4	0	0	4
BAE-794	Entrepreneurial Marketing	4	0	0	4

SYLLABUS

BAP-657	Introduction to SPSS	L	T	P	C
	Total Contact Hours: 56 Hours	0	0	4	2
	MBA				
	Prerequisite: Logical reasoning and aptitude				
	Marks 100				

Internal : 100	External : 0

Course Objective	
1	To make the students understand the use of various techniques for Data Analysis.
2	To study Business Decision Making with practical use of SPSS software
3	To develop analytical abilities among students.

CO	Description
CO1	To understand the basics of the SPSS.
CO2	Enabling students for using the descriptive and inferential Statistical techniques on the SPSS
CO3	To analyse and interpret various descriptive tests including charts and hypothesis tests to supplement decision making in business scenario
CO4	To predict and forecast the future through regression modeling
CO5	To create and implement a research proposal for the real life business problems

Content of the Syllabus

Unit-1

An Overview of SPSS
Mouse and keyboard processing, frequently –used dialog boxes
Editing output
Printing results
Creating and editing a data file

Managing Data:
Listing cases, replacing missing values, computing new variables, recording variables, exploring data, selecting cases, sorting cases, Merging files

Graphs
Creating and editing graphs and charts

Frequencies:
Frequencies, bar charts, histograms, percentiles

Unit-II

Descriptive Statistics:
Measures of central tendency, variability, deviation from normality, size and   stability. Cross Tabulation and chi-square analyses
The means Procedure

Bivariate Correlation:
Bivariate Correlation, Partial Correlations and the correlation matrix, Chi-Squre-Test

Unit-III

The T-test procedure:
Independent –samples, paired samples, and one sample   tests

The one way ANOVA procedure:
One way analysis of variance

General Linear model:
Two –way analysis of variance

General Linear model:
Simple Linear Regression, Multiple regression analysis Multidimensional scaling.

Recommended Books:
1.   Business Research Methods, Cooper, Schindler, TMH
2.   Management Research Methodology, Krishnaswamy, Sir Kumar, Pearson
3.   Research Methodology, C. R. Kothari, Newage Publication
4.   Research Methodology, Zeikmund, Cengage
5.   Research Methodology, Paneer Selvam, PHI
6.   Research Methodology, Prasanta Sarangi, Taxmann
7.   A Text Book of Research Methodology, AKPC Swain, Kalyani
8.   SPSS for Windows, Step; George and Mallery,

NOTE FOR THE PAPER SETTER

The syllabus has been divided into three units. Paper setter will set 3 questions from each unit and 1 compulsory question spread over the whole syllabus consisting of 5 short answer questions. Compulsory question will be placed at number one. Candidate shall be required to attempt 6 questions in all including compulsory question and selecting not more than 2 questions from each unit. All questions carry equal marks.

Course Name	Course Code	PO/CO	Description of CO	Apply knowledge of management theories and practices to solve business (PO 1)	Foster Analytical and critical thinking abilities for data-based decision making (PO2)	Ability to develop Value based Leadership ability (PO 3)	analyze and communicate global, economic, legal, and ethical aspects of business and others in the achievement of organizational goals, (PO 5)	Ability to develop innovative and entrepreneurial mindset. (PO 6)
Introduction to SPSS	BAT 657	CO1	To understand the basics of the SPSS.	3	3			
		CO2	Enabling students for using the descriptive and inferential Statistical techniques on the SPSS		3			
		CO3	To analyse and interpret various descriptive tests including charts and hypothesis tests to suppliment decision making in business scenario	1	3			
		CO4	To predict and forecast the future through regression modeling	3				
		CO5	To create and implement a research proposal for the real life business problems	3				
	2.75			2.75	3.00			

LIST OF EXPERIMENTS AS PER CURRICULUM

Laboratory Name : COMPUTER LAB			Room No. 209,410 Subject Code: BAP-657		
Semester: I					
Subject Name: SPSS					
Sr. No.	Experiment Name	Objective of experiment	Observations (Parameters to be recorded)	Sample Reading taken by faculty (Yes/No) (Signature of Faculty/Coordinator)	Course Outcome
1	Introduction to SPSS	To make student familiar with the basic interface of SPSS	Yes	Yes	CO 1
2	Basic functions of SPSS	To perform the following functions in SPSS: 1. Sorting file 2. Split file 3. Compute 4. Recode 5. Select cases	Yes	Yes	CO 1
3	Graphs	To understand process of graphical representation of data	Yes	Yes	CO 1
4	Measures of central tendency	To understand Cross tabs, frequency and measure of central tendency CROSS TABS	Yes	Yes	CO 1
5	correlation	To understand and perform partial correlation	Yes	Yes	CO 1
6	Regression	To understand linear regression	Yes	Yes	CO 2
7	correlation	To understand and perform Bivariate correlation	Yes	Yes	CO 2
8	One sample t-test	To understand and perform one sample t-test	Yes	Yes	CO 2
9	Paired t-test	To understand and perform paired sample t-test	Yes	Yes	CO 2
10	Independent sample t-	To understand and perform independent sample t-test	Yes	Yes	CO 2

	test				

Experiment No. 1

Q. 1.   Introduction to SPSS.

SPSS (Statistical Package for Social Sciences) is a versatile and responsive program designed to undertake a range of statistical procedures. SPSS software is widely used in a range of disciplines and is available from all computer pools within the University of South Australia.

It's important to note that SPSS is not only statistical software – there are many others that you may come across if you pursue a career that requires you to work with data. Some of the common statistical packages include Stata and SAS (and there are many others).
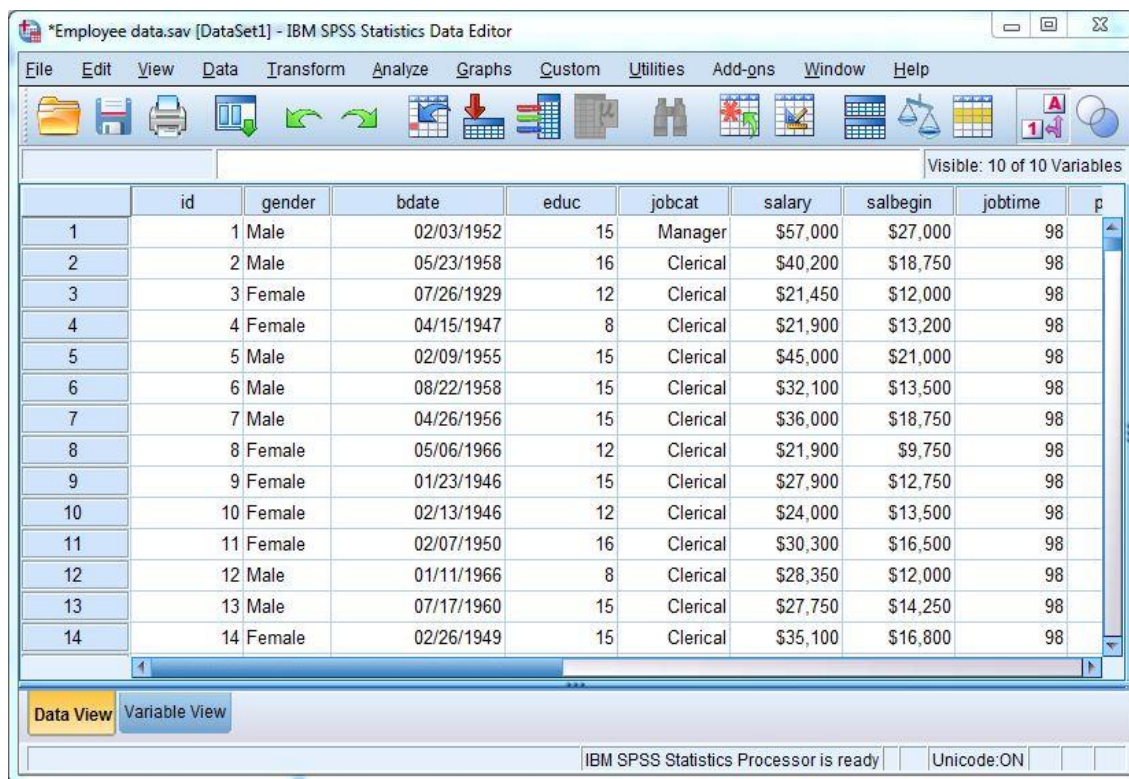
Q.2.   Four Windows of SPSS.

1. Input window : It is the first page that gets displayed when we open SPSS software. Here we enter the data primarily.

- Data view : The data view is used to store and show your data. It is much like an ordinary spreadsheet although in general the data is structured so that rows are cases and the columns are for the different variables that relate to each case.

- Variable view : The variable view contains the variables on your data set , so it defines the properties of your dataset. Each row will define all of the various variables . The variables includes – name, type, width, decimals, label, values, missing, column, align and measure.

	School_Class
1	2
2	1
3	1
4	3
5	1
6	1
7	4
8	4
9	1
10	1
11	4
12	1
13	3

Data View Variable View

2. Output window: This window is used to show the results that have been output from your data analysis. Depending on the analysis that you are carrying out this may include the Chart Editor Window or Pivot Table Window.

3. Syntax window: This window shows the underlying commands that have executed your data analysis. If you are a confident coder this is where you can amend the code or write your own from scratch and then run your own custom analysis on your data set.

4. Script window: Scripts can be used to customize operations within a particular stream and they are saved with that stream. Scripts can be used to specify a particular execution order for the terminal nodes within a stream. It is mainly used for coding and programming.
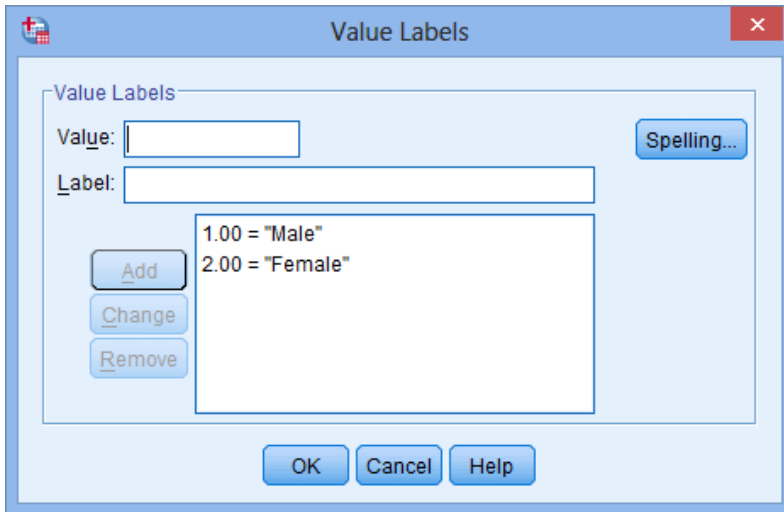
Q.3. Uses of SPSS in business?

- SPSS is used as a data collection tool by researchers. The data entry screen in SPSS looks much like any other spreadsheet software. We can enter variables and quantitative data and save the file as a data file. Furthermore, we can organize our data in SPSS by assigning properties to different variables.

- Once data is collected and entered the data sheet in SPSS, we can create an output file from the data. For example, we can create frequency distribution of our data to determine whether our data is normally distributed. The frequency distribution is displayed in an output file.

- The most obvious use for SPSS is to use the software to run statistical tests. SPSS has all of the most widely used statistical tests built-in to the software. Therefore, we won't have to do any mathematical equations by hand.

- SPSS helps to create reports of questionnaire data in the form of graphical presentations which are ready for publications and reporting.

- SPSS research tool can compare and explore the differences between responses to two or more questions. It's very easy to find the difference between to batches of data.

- Using this tool we can make analysis according to the expected research goals and obtain the gained results.

- SPSS is the powerful tool for data analyzing and it's also used for SPSS data entry. It's the first step in statistical process and it should be very important to input data correctly.

EXPERIMENT: 2

To perform the following functions in SPSS:

6. Sorting file
7. Split file
8. Compute
9. Recode
10. Select cases

SORTING FILE

Sorting data allows us to re-organize the data in ascending or descending order with respect to a specific variable. Same procedures in SPSS require that your data be sorted in a certain way before the procedure will execute. **Using SPSS and Pasw/sorting variables.**

One of the functions you will often want to perform in the data view of the data editor is sorting by variables values to bring those of similar value together. This can be a very useful when exploring the raw data in your datasheet. There are two ways to do this. One is quite simple; the other allows sorting on more than one variable.

<u>**STEPS**</u>

The simple way to sort variable values is to make sure you are looking at the data view tab. Then scroll to the variable by which you want to sort. Right click on its column heading and a context menu will appear. At the bottom of the context menu are two sorting options: "sort

ascending" and "sort descending". Choosing the first will move the smallest values to the top of the data set while a descending sort will bring up the largest value. Keep in mind that SPSS automatically (unlike excel) moves all rows in unison. So you don't need to worry about cases becoming misaligned when sorting.

Sometimes it's useful to sort on multiple variables, which means that SPSS while sort the data set by the values of the first variable than breaks ties in that sort by sorting on the values of the second variable and so on. The sorts on multiple variables at once choose "data" >"sort cases":

You will get dialog window:

The "sort order" box allows the choice between ascending or descending order once again. On the left is a list of all the variables in the data set. Choose them the most important sort first by clicking the variable involved and then the blue arrow and repeat.

Save your data set after sorting to retain it as a default sorting.
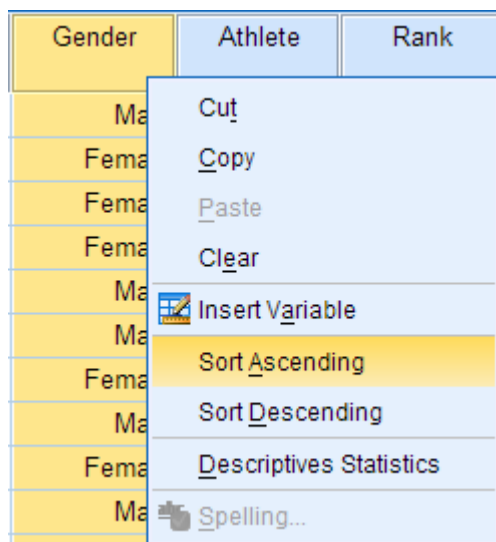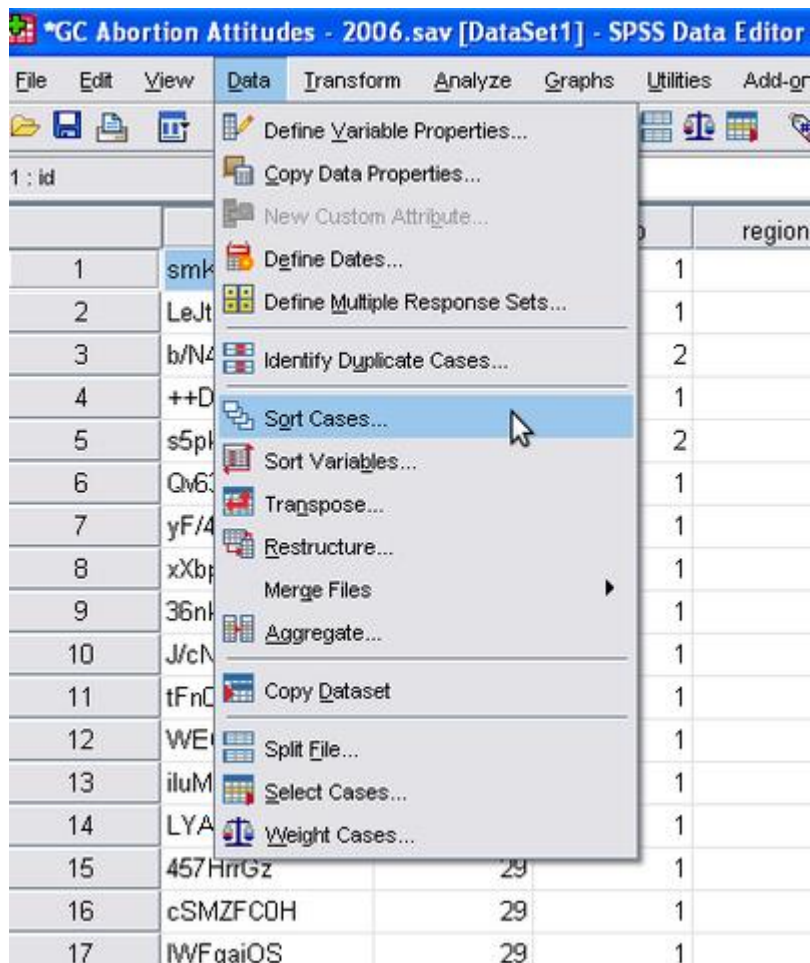
SPLIT FILE

Split file is a SPSS facility to perform any analysis sequence for each group defined by a categorical split variables. When you turn split file on. It will be active until you turn it off explicity or you replace the current data set with a different one.

STEPS

The data>split file dialog lets you control this mechanism. To active

- Choose either
- Compare groups: produces single tables including all groups
- Organize output by groups: produces separate tables for each group
- Select a variable region in our example for the group based on field
- Make sure to check sort the file by grouping variables is selected, if you are not certain that the file is sorted on the grouping variable.

After clicking OK, split is activated (you can see "split file on" in the status line of the SPSS window) and any procedure you invoke now will be performed. Separately on each group defined by the grouping variables as long as you do not turn off split file.

If you need to know what is current split variable you will have to open the data> split file dialog.
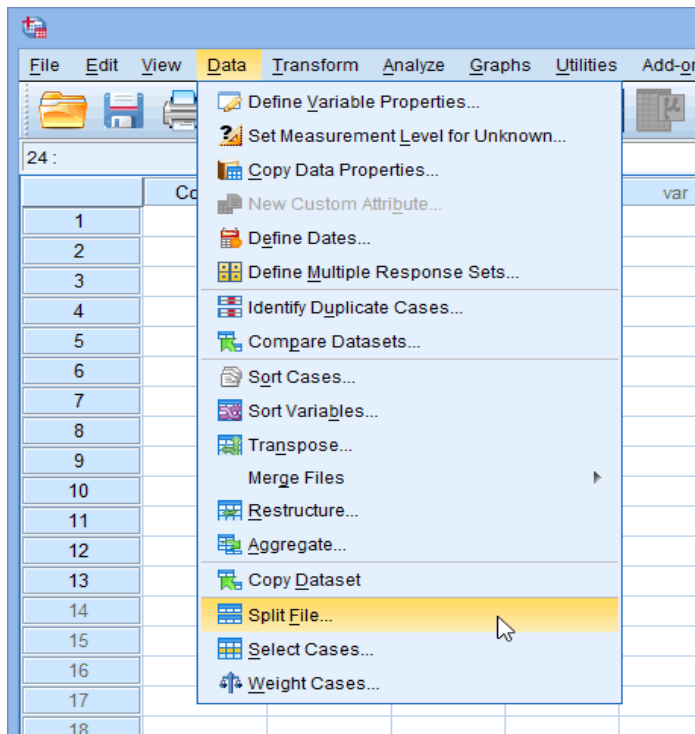
COMPUTE

Sometimes you may need to compute a new variable based on existing information (from other variables) in your data.

For example: you may want to:

- Convert the units of a variable from feet to meters.

- Use a subjects height and weight to compute their BMI.

- Compute a sub scale score from items on a survey

- Apply a competition conditionally so that a new variable is only computed for cases where certain conditions are meet

In this tutorial we will discuss how to compute variables in SPSS using numeric expressions, built –in functions and conditional logic.

To compute a new variable. Click transform > compute variable

The compute variable window will open where you specify how to calculate your new variable

RECODE

Sometimes you will want to transform a variable by grouping its categories or values together. For example: you may want to change a continuous variable into a categorical variable or you may want to merge the categories of a normal variable. In SPSS this type of transform is called recoding.

In SPSS there are three basic options for recoding variables.

- Recode in different variables
- Recode into same variables
- Do if syntax

Recoding into a different variable transforms an original variable into a new variable. That is the changes do not overwrite the original variable, they are instead applied to a copy of the original variable under a new name.

STEPS

To recode into different variables click transform >recode into different variables

The recode into different variables window will appear. The left column lists all of the variables in your data set. Select the variables you wish to recode by clicking it. Click the arrow in the center to move the selected variable to the center text box.
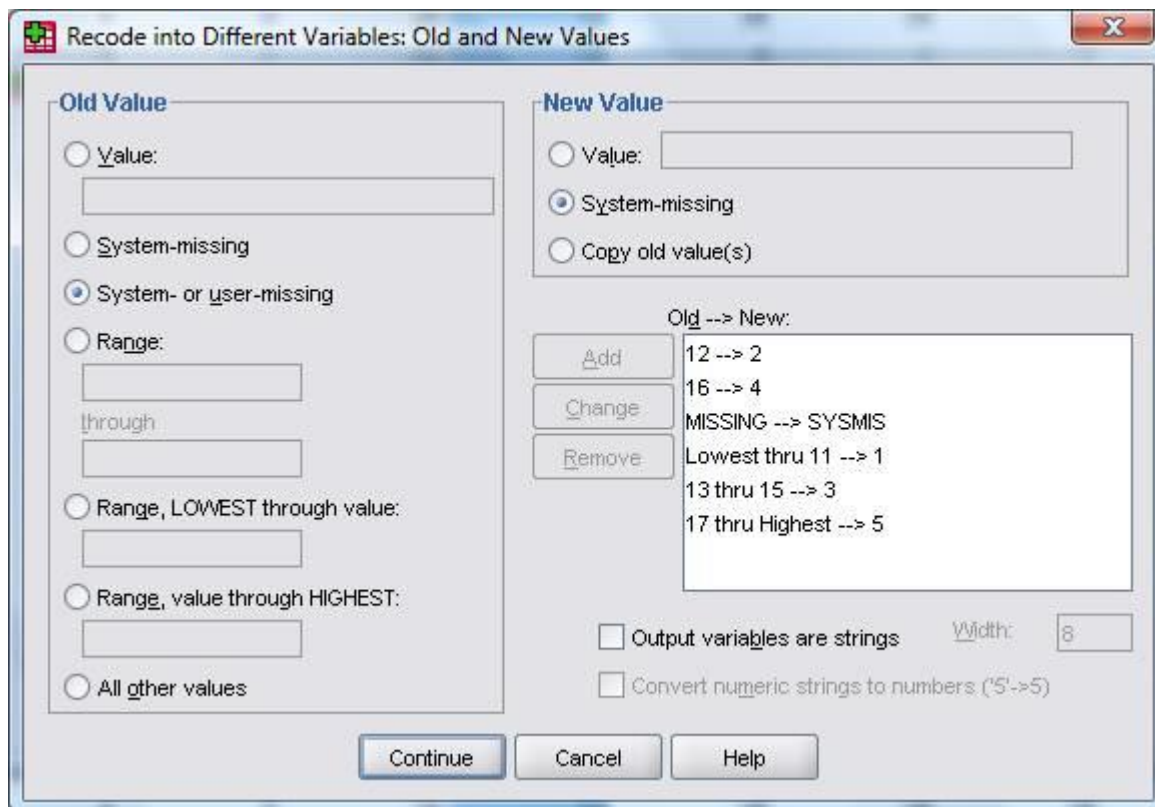
SELECT CASES

   Data files are not always organized to meet specific users need. For example: users may wish to select specific subjects or split the data file into separate groups for analysis. If you have two or more subjects groups in your data and you want to analyze each subject independently you want to analyze each subject you can use the select case option.

<div align="center">

STEPS

</div>

- Open the part1.sav data file provided in your computer. Make sure you are on data view
- Click the data menu, and then click select cases. The select cases dialog box opens. Select the if condition is satisfied option
- Click the if button. The select cases: if dialog box opens. Select the gender variables in the left box, and then click the transfer arrow button to move it to the right box. Click the = button and then click the 1 button. Because the symbol 1 represents formals according to our value levels we are telling SPSS to select only female participants.
- Click the continue button to return to the select cases dialog box. Click the OK button to return to the data view. All males will be excluded from the statistical analysis.
- Run an analysis. Note the crossed out participants in the data file. Those represent all the male participants.
- To undo the select cases open the select cases box and click the reset button.

Experiment no. 3

GRAPHS

A bar chart is type of graph that displays statistical data. When you make a bar chart in SPSS, the X-ais is a categorical variable and the Y-ais represents summary statistics such as means, sums or counts. Bar charts are accessed in SPSS through the legacy dialog command or through the chart builder.

How to make bar chart in SPSS:

STEPS

- open the file you want to work within SPSS or type the data into a new worksheet
- click "graphs" then click "legacy dialog" and then click bar to open the bar charts dialog box
- click on an image for the type of bar graphs you want (simple clustered, or stacked) and then click the appropriate radio button tell SPSS what type of data is your variables list
- click on radio button in the bar represents area top choose what you would like the bars to represent
- click a variable in the left hand window in the defined simple bar popup window and then transfer those variables by clicking the appropriate center arrow
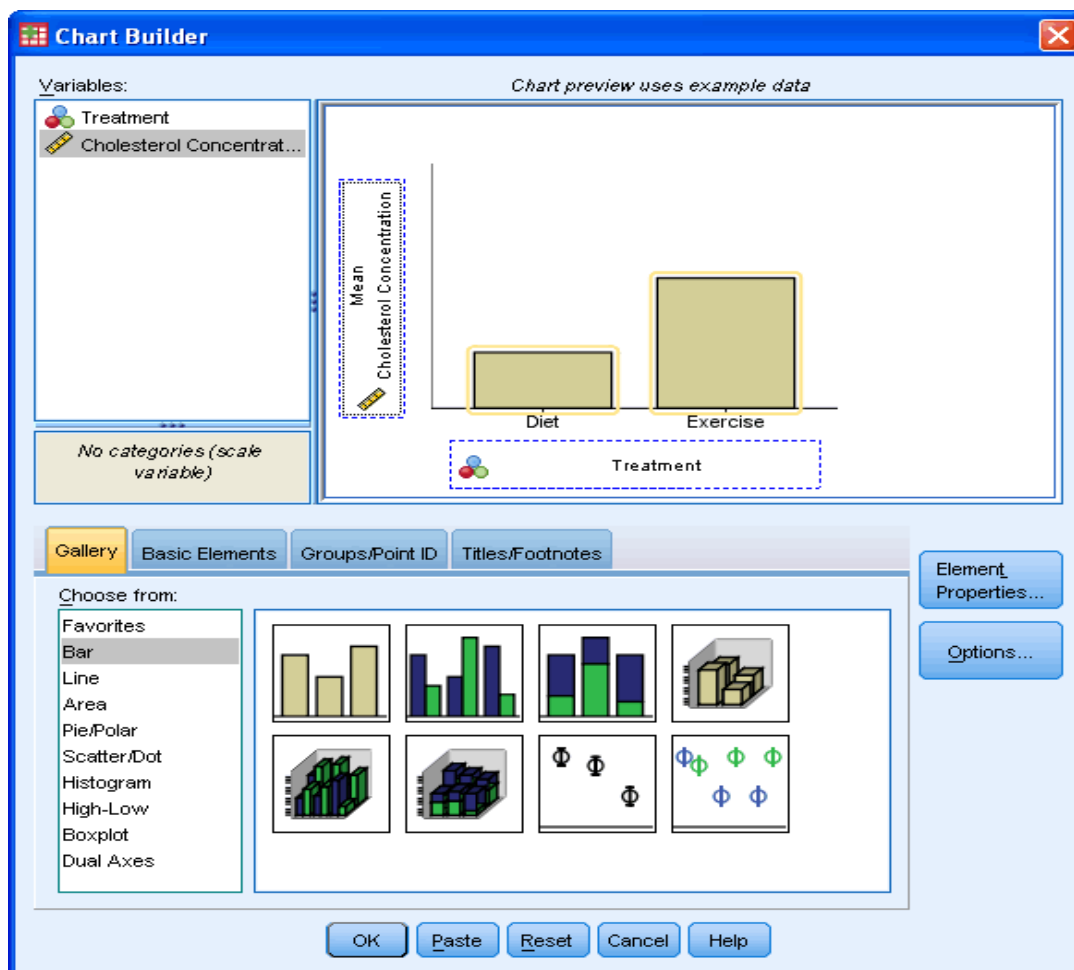
GRAPH

We use different types of graphs are as follows:

1. Pie charts

2. Bar charts
3. Histograms
1. Pie charts

IBM SPSS statistics is software specifically designed for statistics especially in social science. The software is capable of creating a large number of graphs types with large varieties of options. Unlike simpler programs like MS excel, SPSS gives you a lot of options for creating pie char
STEPS

- Go to the analyze and select descriptive then frequencies
- Click "graphs" click "legacy dialog" then click pie
- Click a radio button to tell SPSS what kind of data you have in the data sheet. Summary for groups of cases. Summary of separate variables of value of individual cases. Click defines, after you have made your selection.
- Choose which variable you want the chart to represent. Click a variable name in the left window and then click the top arrow to move it into the slices represent "box".
- Choose other variable you want the chart to represent. Click a variable name in the left window and then click the top arrow to move it into the slices represent "box".
- Choose other customs options
- Click OK
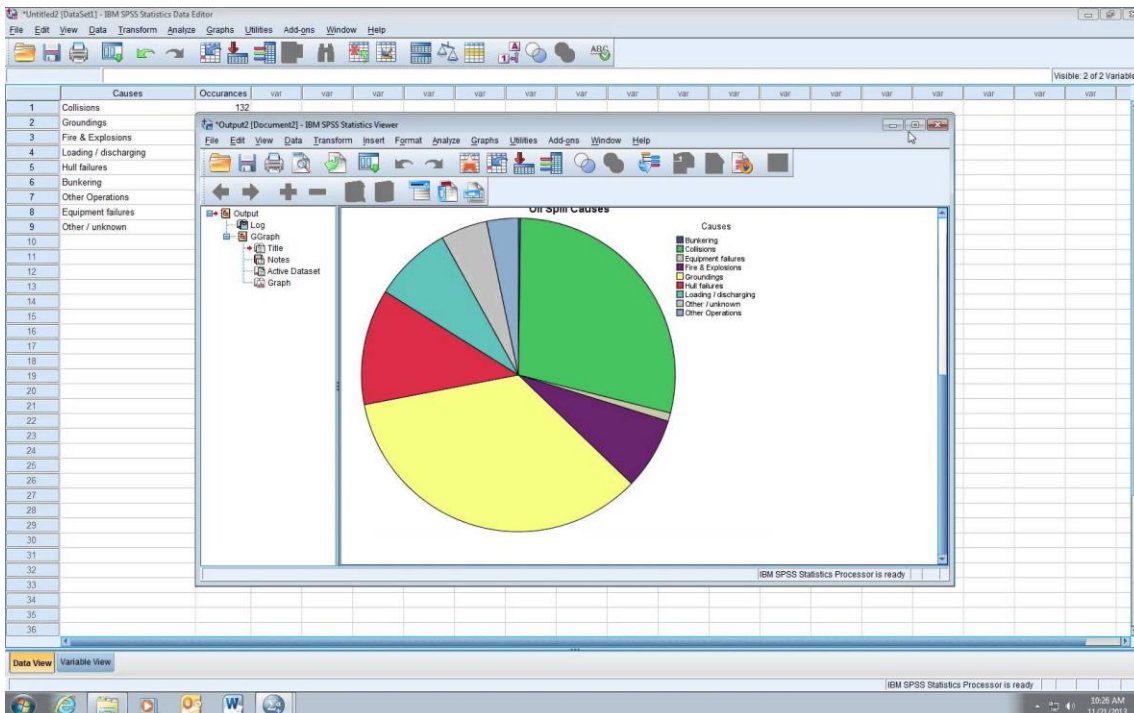
2. Bar charts

A bar chart is a type of graph that displays statistical data. When you make a bar chart in SPSS the Axis is on categorical variable and the Axis represents summary statistics such as means. Sums or counts. Bar charts are accessed in SPSS through the legacy dialog command or through the chart builder

STEPS

- Open the file you want to work with SPSS or type the data into a new worksheet.
- Click graphs then click legacy dialog and then click bar to open the bar charts dialog box
- Click on an image for the types of bar graphs you want (simple, clustered or staged) and then click the appropriate radio button.
- Click a radio button in the bars represent area.
- Click a variable in the left hand window
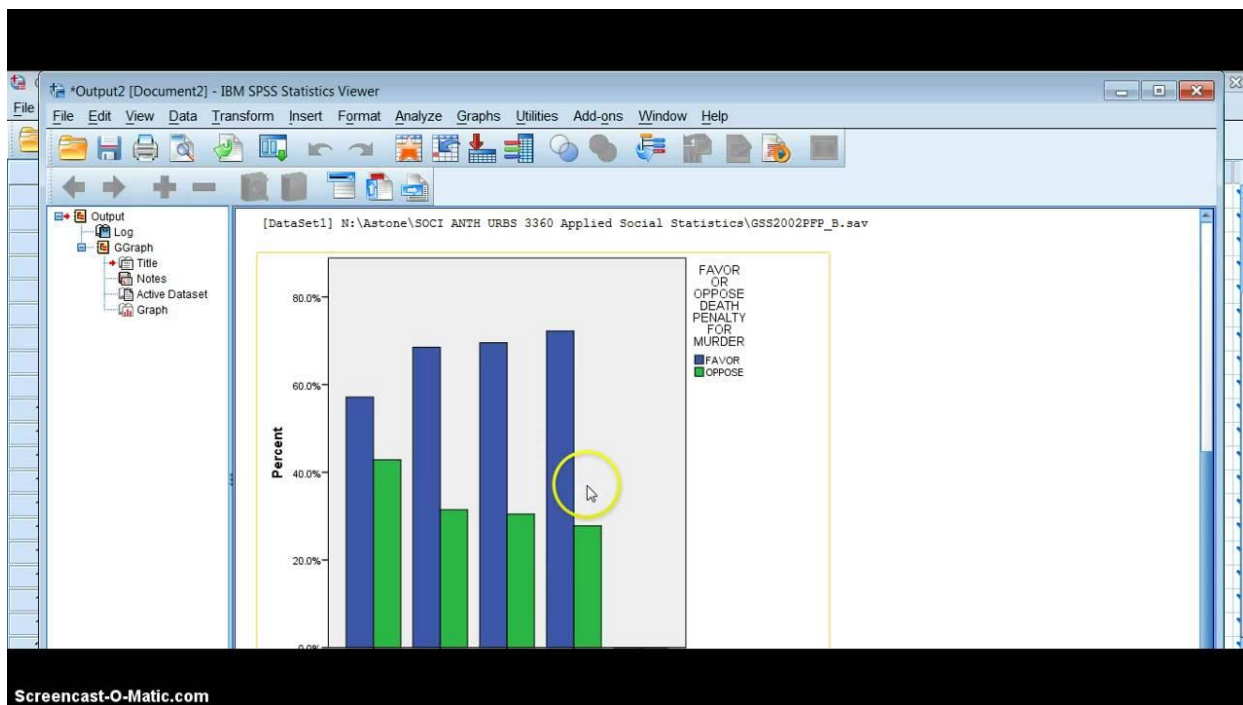
3. **Histogram charts**

A histogram is useful tool for graphically displaying a set of data. It looks similar to a frequency distribution table but with a histogram data is separated into bins (widths) instead of frequencies (where individual entries and counted)

STEPS

- Click graphs then mouse over legacy dialog and then click histogram
- Pick one variable from the left dialog box and then click the center arrow to move your selection to the variable box.

- Click OK.   SPSS may take a moment to run the graph utility. You may see a blank screen with the words "running graphs" at the bottom right while SPSS performs the necessary calculations.
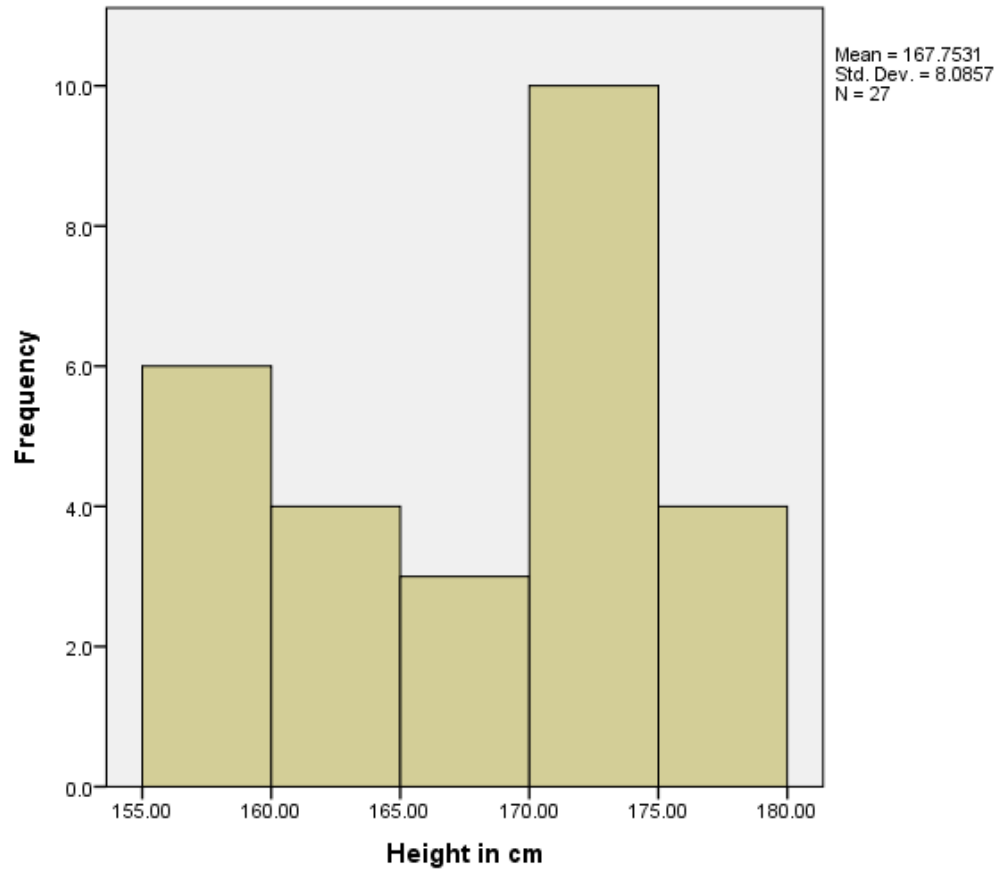
EXPERIMENTAL NO 4:
Cross tabs, frequency and measure of central tendency

Cross tabs in SPSS in just another name for contingency table which summaries the relationship between differential variables of categorical data cross tabs can help you show the proportion of cases in sub groups. The basic cross tabs in SPSS commands gives you count by default. (In other words you will get a frequency distribution table with counts)

In order for cross tabs to be useful and produce the information you normally see in a contingency table you will need to specify row percents or column percents

STEPS

- Type your data into a SPSS worksheet
- Click "analyze" then have over "descriptive statistics" and then click "cross tabs"
- Select one variable in the left window
- Check which percentages you want to see (rows and column)
- Click "continue" and then click OK. The cross tab windows will appear


-
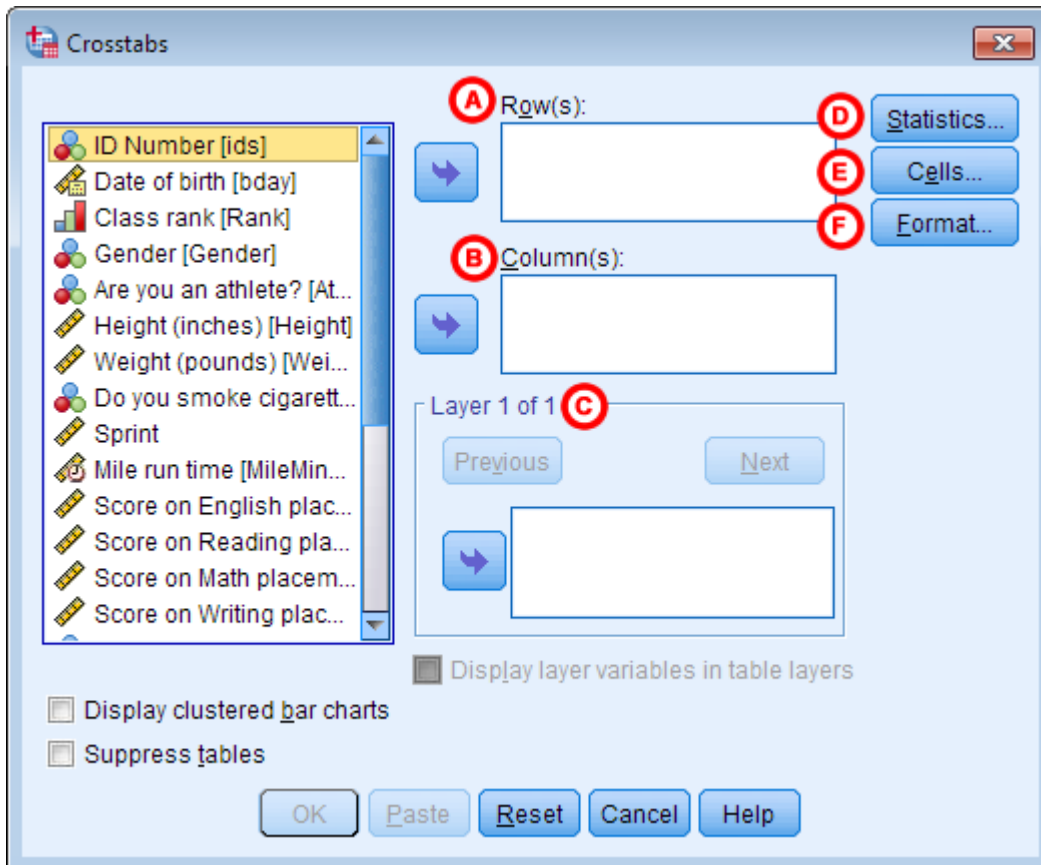
FREQUENCY DISTRIBUTION

A frequency distribution table can give you an idea in a glance. They are commonly introduced in elementary statistics and AP statistics although you may have encountered them in basic math classes. Frequencies form the foundation of further study in statistics like probabilities and distribution table. They take second in create in SPSS once you have entered your data into your worksheet. SPSS uses the frequency command to populate frequency table.

STEPS

- Type your data into an SPSS worksheet

- Click analyze then mouse over descriptive statistics then click frequencies.

- Select one or more variables in the left column of the frequencies, popup window.

- Click the display frequency table check box and then click OK.
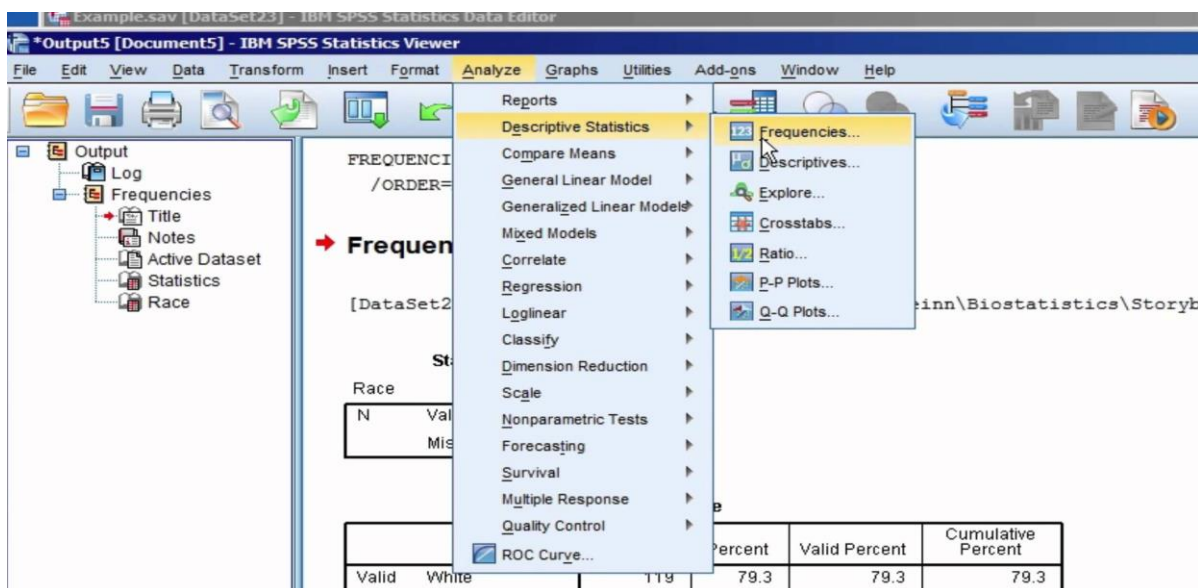
Measure of central tendency

The most common measure of central tendency are the arithmetic mean, the median and the mode.

A central tendency can be calculated or a mathematical distribution such as the normal distribution.

Mean: sum of all values / total no of values

Median: middle value/ whom data I arranged in order.

Mode: observation that occurs most of the timer.

To calculate measure of central tendency

1 Click the open button on data editor toolbar.

2 In the open data dialog box, navigate to the location where you saved the data file, select the part of file and click open button.

3 Click the analyze menu, gets a descriptive statistics and then go to measure of central tendency.

4 Go to the statistics button and then to central tenancy and select mean, median, mode.

5 In case of dispersion, select standard variable, skewness etc.

6 click on continue button.
7 you will get tables and desired results.
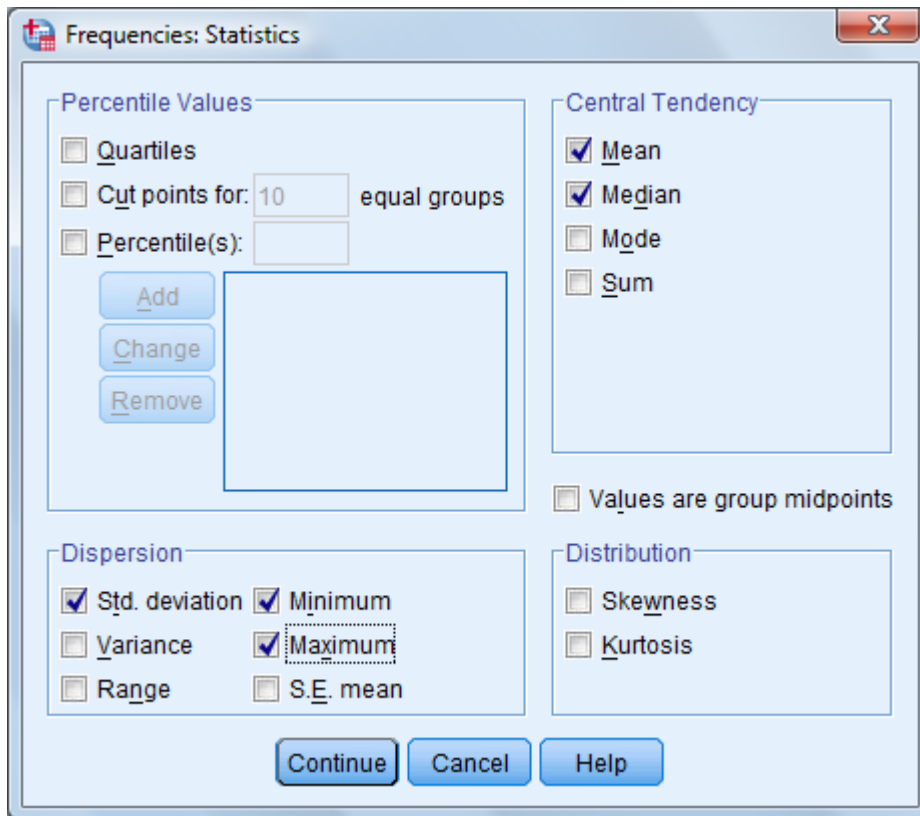
We interpret from table that

1 Number of females in Punjab more than number of males.

2 Number of makes in H.P are much larger than that of females.

3 There is no male from Haryana.

Gender * State Crosstabulation

Count

		State				Total
		Punjab	HP	Haryana	Others	
Gender	Male	1	10	0	7	18
	Female	3	1	3	2	9
Total		4	11	3	9	27

RESULT FOR FREQUENCY
We obtained a frequency table for gender and category in the output

Category

		Frequency	Percent	Valid Percent	Cumulative Percent
	Gen	24	88.9	88.9	88.9
Valid	OBC	3	11.1	11.1	100.0
	Total	27	100.0	100.0	

Gender

		Frequency	Percent	Valid Percent	Cumulative Percent
	Male	18	66.7	66.7	66.7
Valid	Female	9	33.3	33.3	100.0
	Total	27	100.0	100.0	

Number or frequency of males in the class is more than female. And we can see from the table that frequency of general students is more than other categories.

RESULT FOR MEASURE OF CENTRAL TENDENCY

We obtained a statistics table in the output for height, graduation marks and weight which includes mean, median, mode, variance, standard deviation, skewness , standard error of skewness, kurtosis standard error of kurtosis, range.

Statistics

		HeightinInch	Grad.Marks	WeightinKG
N	Valid	27	27	27
	Missing	0	0	0
Mean		5.504	50.7400	59.3704
Median		5.600	60.0000	59.0000
Mode		5.7	7.60[a]	65.00
Std. Deviation		.2653	27.64636	8.59852
Variance		.070	764.321	73.934
Skewness		-.337	-.858	-.261
Std. Error of Skewness		.448	.448	.448
Kurtosis		-1.208	-.880	-.450
Std. Error of Kurtosis		.872	.872	.872
Range		.8	81.90	35.00

a. Multiple modes exist. The smallest value is shown

Experiment 5 : Correlation

The bivariate correlation measures the strength and direction of linear relationship between pairs of continuous variables. The bivariate Pearson correlation only reveals association among continuous variables. It doesn't provide any interference about causation no matter how large the correlation coefficient is. It produces a sample correlation coefficient (8) which measures the relation between pairs of variables.

$$r = \frac{n(\Sigma xy) - (\Sigma x)(\Sigma y)}{\sqrt{[n\Sigma x^2 - (\Sigma x)^2][n\Sigma y^2 - (\Sigma y)^2]}}$$
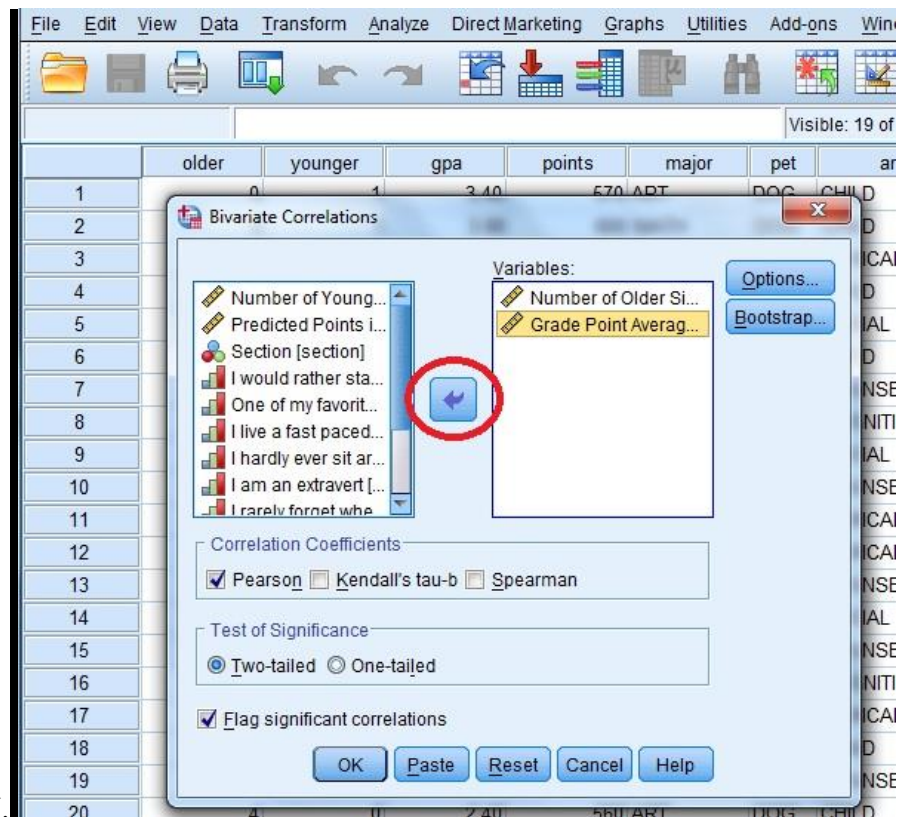
FORMULA :

PROCEDURE

Step 1: Type data in SPSS worksheet.

Step 2: Click on "Analyze" then Click on correlate.
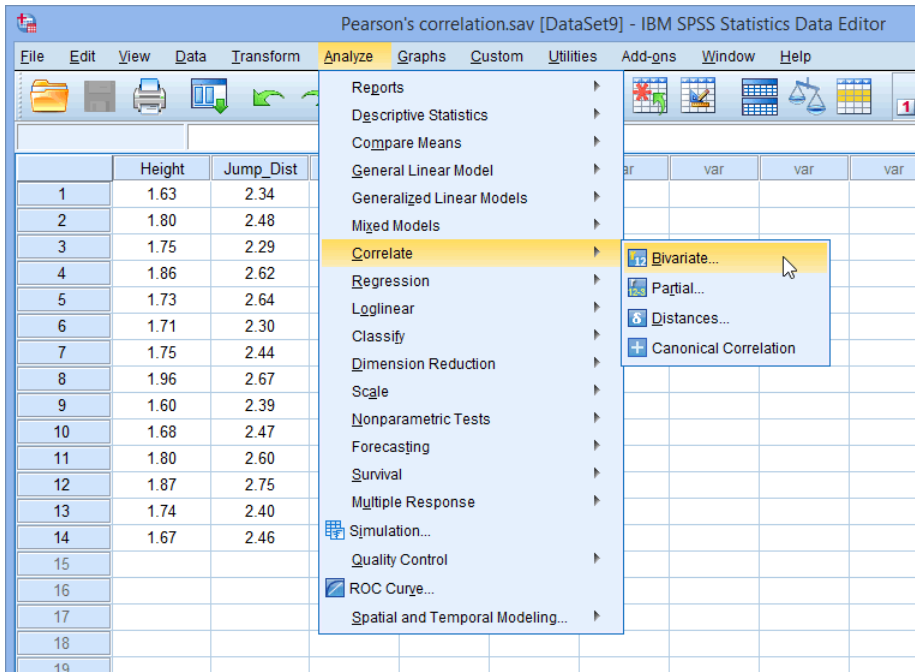
Step 3: Click on "Bivariate".

You'll get bivariate correlation dialogue box.

Step 4: Pick the variables you want to correlate , drag them to variable
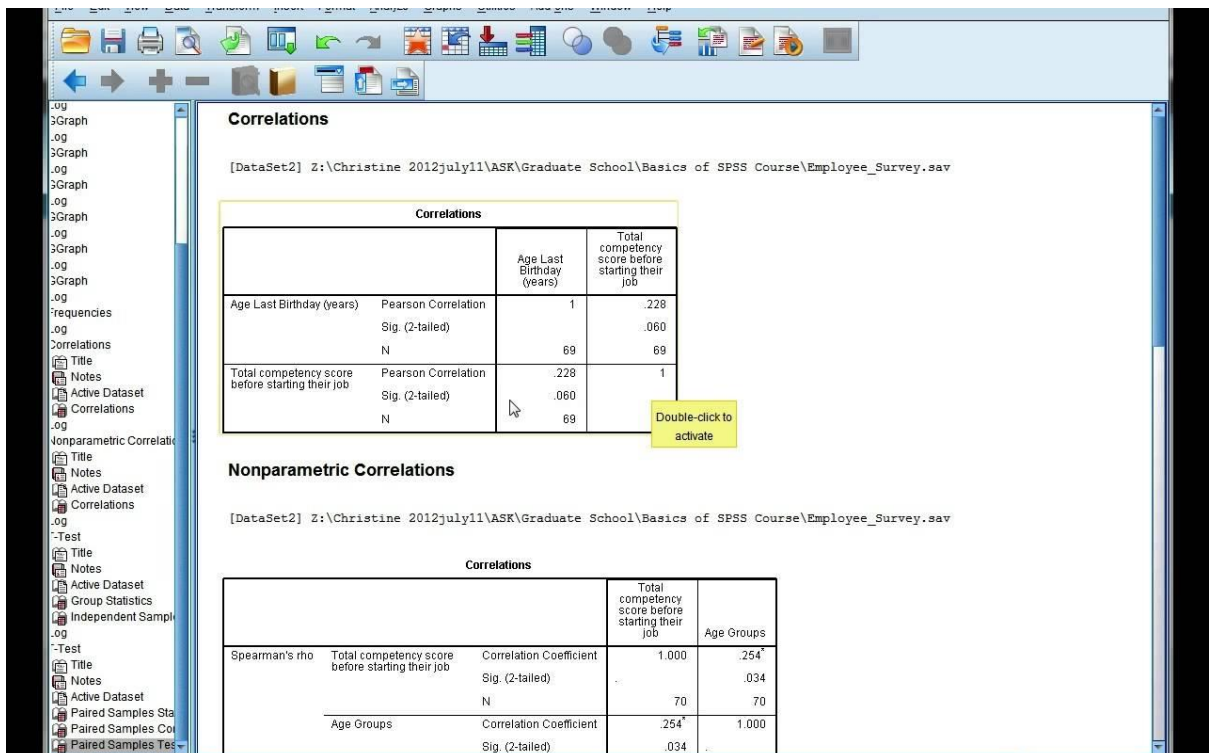

Step 5: Then Click on OK.

Pearson's correlation.sav [DataSet9] - IBM SPSS Statistics Data Editor

File   Edit   View   Data   Transform   Analyze   Graphs   Custom   Utilities   Add-ons   Window   Help

	Height	Jump_Dist
1	1.63	2.34
2	1.80	2.48
3	1.75	2.29
4	1.86	2.62
5	1.73	2.64
6	1.71	2.30
7	1.75	2.44
8	1.96	2.67
9	1.60	2.39
10	1.68	2.47
11	1.80	2.60
12	1.87	2.75
13	1.74	2.40
14	1.67	2.46

Analyze menu:
Reports
Descriptive Statistics
Compare Means
General Linear Model
Generalized Linear Models
Mixed Models
Correlate → Bivariate... / Partial... / Distances... / Canonical Correlation
Regression
Loglinear
Classify
Dimension Reduction
Scale
Nonparametric Tests
Forecasting
Survival
Multiple Response
Simulation...
Quality Control
ROC Curve...
Spatial and Temporal Modeling...

NOTE: The default coefficient is pearson if you want the spearman coefficient or others check its box.

DEGREE OF CORRELATION

A. Perfect positive or negative (8) = ±1
B. Absence of correlation (8) =0
C. High degree of positive or negative = ±0.75 to 1.00
D. Moderate degree of positive or negative = ± 0.25 to 0.75
E. Low degree of positive or negative = 0 to ±0.25

Correlations

[DataSet2] Z:\Christine 2012july11\ASK\Graduate School\Basics of SPSS Course\Employee_Survey.sav

Correlations

		Age Last Birthday (years)	Total competency score before starting their job
Age Last Birthday (years)	Pearson Correlation	1	.228
	Sig. (2-tailed)		.060
	N	69	69
Total competency score before starting their job	Pearson Correlation	.228	1
	Sig. (2-tailed)	.060	
	N	69	69

Nonparametric Correlations

[DataSet2] Z:\Christine 2012july11\ASK\Graduate School\Basics of SPSS Course\Employee_Survey.sav

Correlations

			Total competency score before starting their job	Age Groups
Spearman's rho	Total competency score before starting their job	Correlation Coefficient	1.000	.254*
		Sig. (2-tailed)	.	.034
		N	70	70
	Age Groups	Correlation Coefficient	.254*	1.000
		Sig. (2-tailed)	.034	.

EXPERIMENT 6

Regression is a statistical technique of modelling the average relationship between two or more variables in general sense, regression analysis means the estimation or prediction of the unknown values of one variable from the known value of the other variables. SPSS provides the facility to know average relationship between two or more variables. In this we will focus only on simple regression – linear regression involving only two variables: a dependent and independent variable.

PROCEDURE

Step 1: Type data in SPSS worksheet

Step 2: Click on "Analyze" and the Click on regression

Step 3: Click on linear

  You'll get linear dialogue box.

Step 4: Add your dependent variable to the dependent field

  Add your independent variable to the independent field

Step 5: Click on "Statistics" , tick "Estimates" and model fit and R.squared change.

Step 6: Click on continue

Step 7: Click on OK

Step 8: Interpret your outcomes.
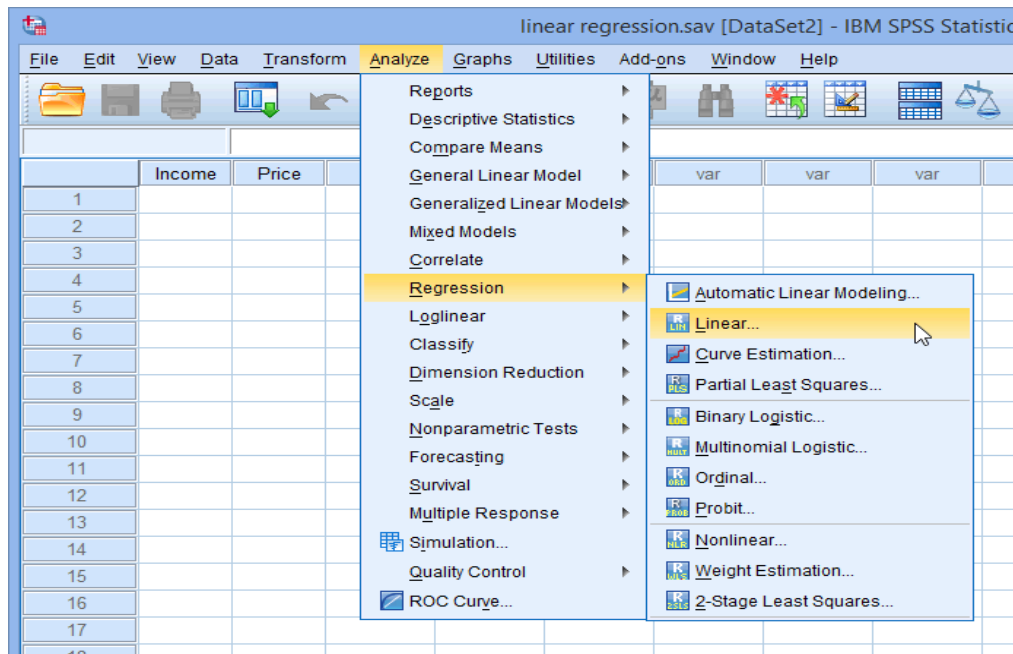
EXPERIMENT 7

As we know analysis of correlation of two or more variables is usually called correlation when it is not possible to measure the perfect qualities due to absence of numerical facts, ranking figures are used.

These numbers ranks rather than actual observation give the coefficient of rank correlation.

This method was developed by the British Physcholgist chories edropid speramn in 1904 Formula

$$r_s = 1 - \frac{6\sum D^2}{n(n^2 - 1)}$$

Procedure

Step. 1 Enter the data in SPSS worksheet

Step 2. Click on analyisxz then click on cometate

Step3.Click on Bioraiate

You will get bivariate correlation dialog box

Step 4. Select the variable that you want to get correlation

Step 5. Click on Pearson box to deselect D
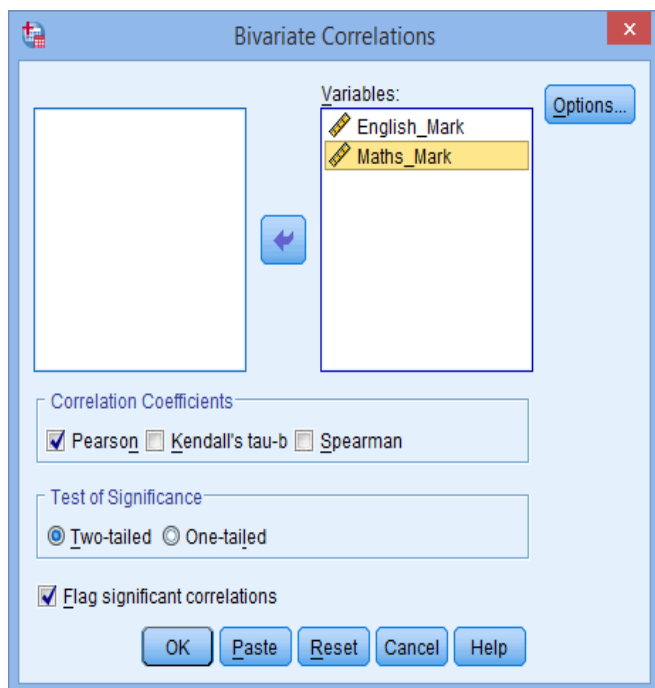
Step.6. Click on the spearman box to select

Correlations

			English_Mark	Maths_Mark
Spearman's rho	English_Mark	Correlation Coefficient	1.000	.669[*]
		Sig. (2-tailed)	.	.035
		N	10	10
	Maths_Mark	Correlation Coefficient	.669[*]	1.000
		Sig. (2-tailed)	.035	.
		N	10	10

*. Correlation is significant at the 0.05 level (2-tailed).

EXPERIMENT 8

1-Test is small test developed by govel in 1908 it is used to analysis or test whether urean of the twi group is same or different 1. Test is in on analysis of two population mean through the use statistically examination a t-test with two sample is commonly used with small sample since testing the normal distribution are not known.

Significant level The degree of significant with which we accept or reject a perfection hypothesis

Degree of freedom The numbers of value in that the final calculation that are free to vary

n- 1

TEST

Parametric   Non- Parametric

Population mean   population variable

One sample   Two sample

T- test

Z-test

Independent sample   Paried sample

T- test   T-test

Z-test

$T = \dfrac{X-\mu}{s/\sqrt{n}}$

Where X = sample mean

μ= Population mean

s = Size
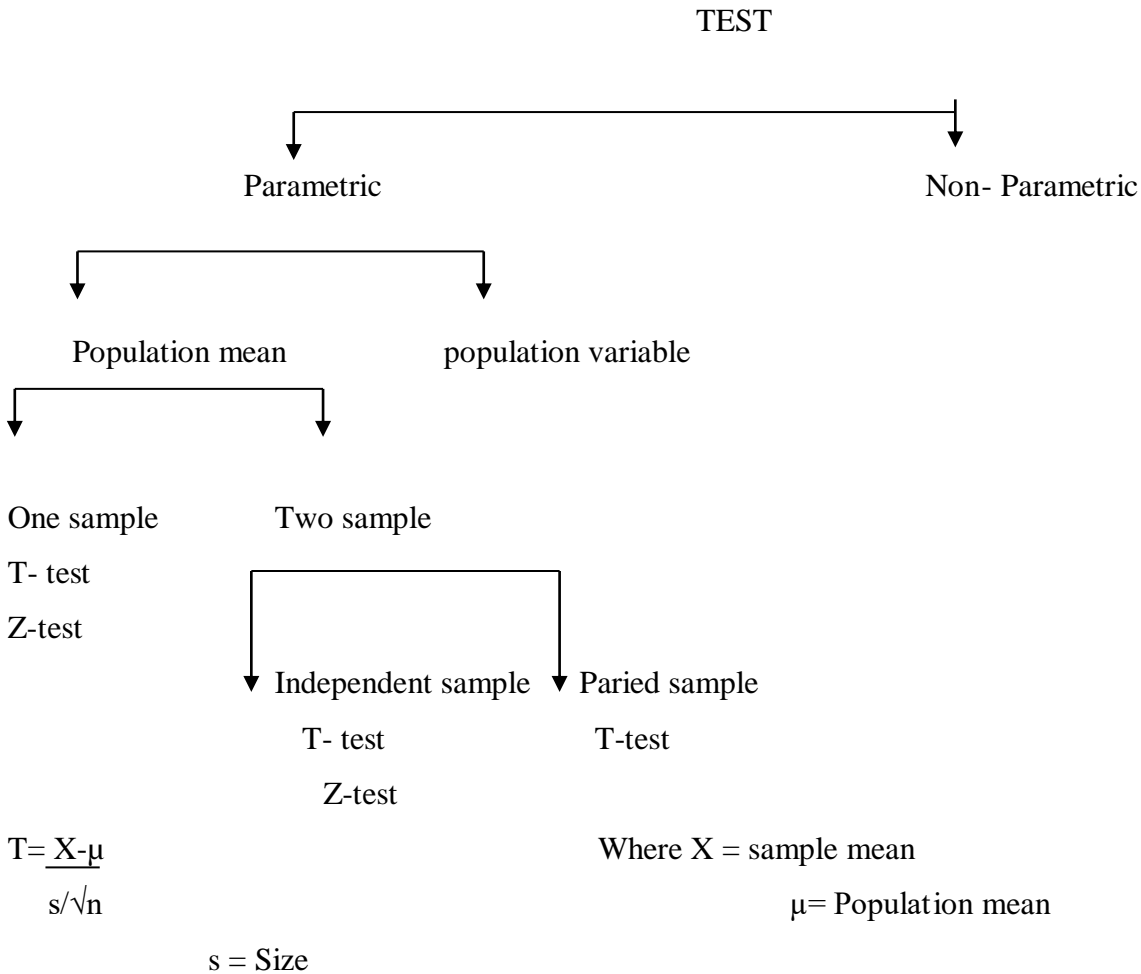
One Sample t test

One sample t-test has only one sample test whether sample mean is equal to specified value or not

The one sample t test determines whether the sample means is staisticallly different form a known or hypothized popultioion mean it is a paramtric test

Procedure

Step 1. Enter the data in spss worksheet

Step 2 .Click on Analyze tehn click on compare mean

Step 3 . Click on smaple on one smaple t test

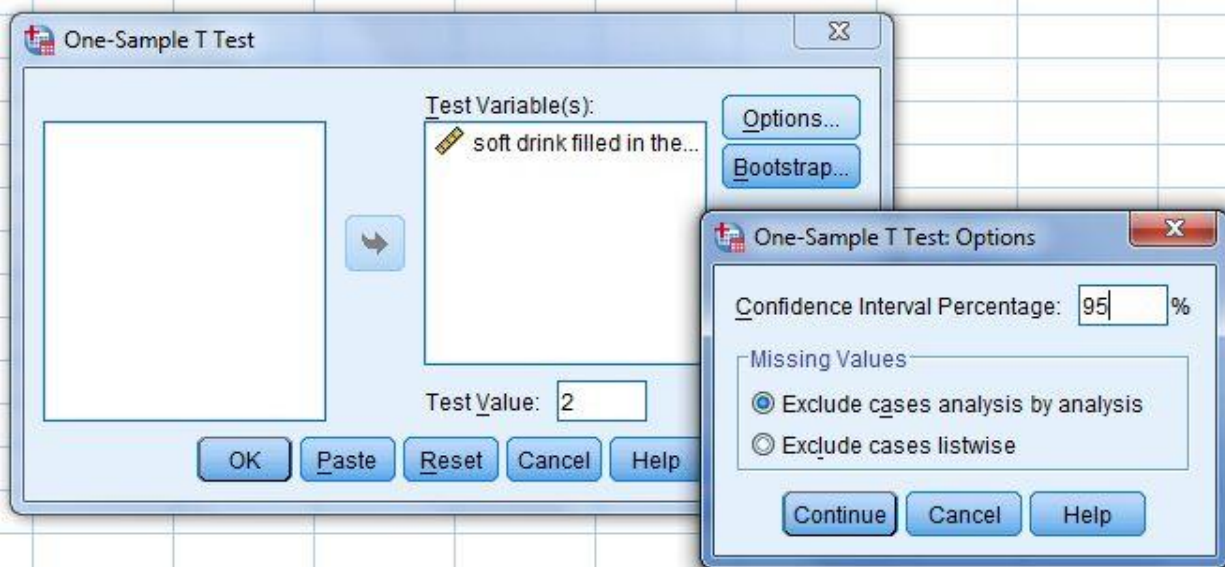Youwill get one sample t test dialog box

Step 4 . select the variable thayt you want to test and drag them to test variable box

Step 5 . Click on option in confidence ineterval proceduire box use / input confidence interval default

Step6 .Excute cases analysis by analysis

Step7. Click on continue

Step 8. Click ok and interpret you output

One-Sample Statistics

	N	Mean	Std. Deviation	Std. Error Mean
soft drink filled in the bottle	30	2.02930	.028766	.005252

One-Sample Test

	Test Value = 2					
					95% Confidence Interval of the Difference	
	t	df	Sig. (2-tailed)	Mean Difference	Lower	Upper
soft drink filled in the bottle	5.579	29	.000	.029300	.01856	.04004
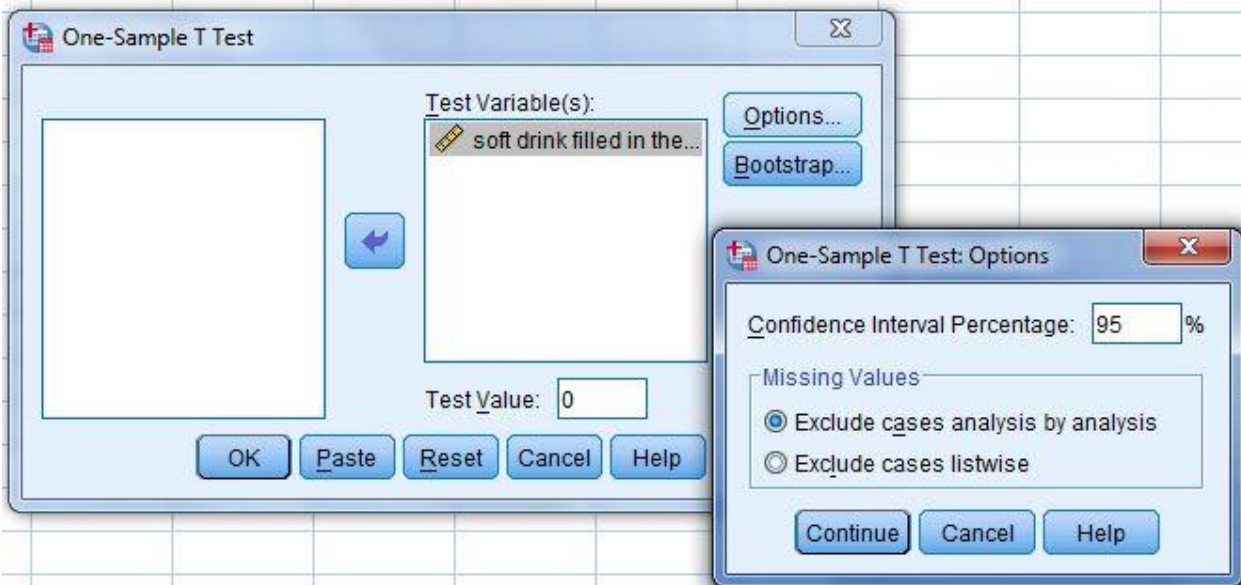
Experiment 9

The following represents the marks of students of two sections A and B. Is there any evidence that there is a difference between the marks of students (30) from two different sections here?

H$_o$: There is no significance difference between the marks of students of two different sections.

H$_1$: There is significance difference between the marks of students of two different sections.
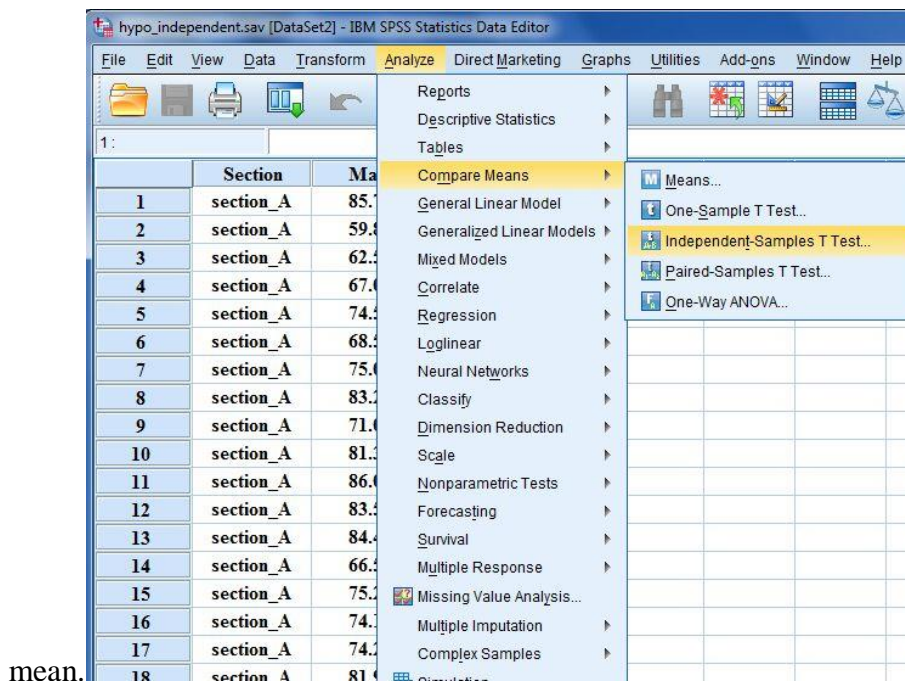
Independent Sample T- test

The Independent Sample t-test also called the two sample t-test. It is an inferential statistical test that determines whether there is a statistically significant difference between the means in two unrelated groups. The Independent Sample t-test is a parametric test.

$$t = \frac{(\overline{X}_1 - \overline{X}_2)}{\sigma_{\text{diff}}}$$

Procedure

Step 1 : Enter the data in worksheet that you want to test.

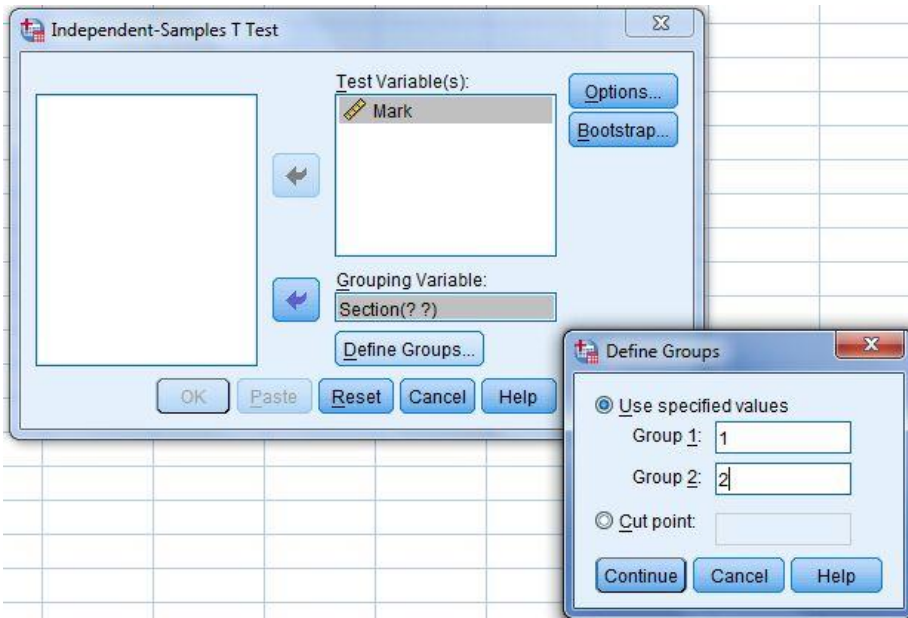Step 2 : Click on "Analyze" then click on compare

mean.

Step 3 : Click on Independent Sample t-test.

You'll get a dialogue box.

Step 4 : Select the variable that you want to test and drag them to test variable test.

Step 5 : In grouping variable box drag the variable you divided into groups.

Step 6 : Click "Define group" you will get a window having Group 1 and Group 2. Enter the value that you have specified in value. For this example (1 for section A, 2 for section B)

Step 7 : Click on continue. If you want to change confidence interval percentage then click on option. And change it.
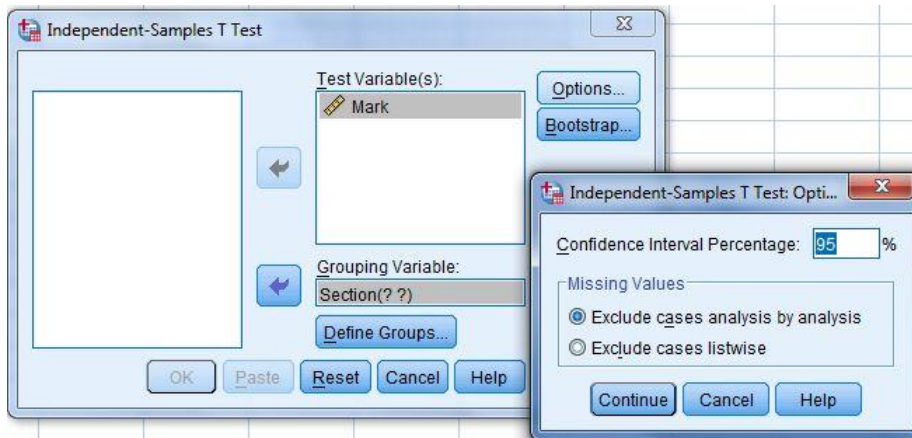
Step 8 : Click on continue and then click on OK. Then interpret your calculated result.

Group Statistics

	Section	N	Mean	Std. Deviation	Std. Error Mean
Mark	section_A	30	75.8500	7.52734	1.37430
	Section_B	30	70.2380	8.78812	1.60448

Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Mark	Equal variances assumed	1.421	.238	2.656	58	.010	5.61200	2.11260	1.38318	9.84082
	Equal variances not assumed			2.656	56.663	.010	5.61200	2.11260	1.38105	9.84295

NOTE : For making interpretation.

If the value of p (i.e. Sig. (2-tailed) > 0.05) , then Null hypothesis is accepted. Otherwise, rejected.

Experiment 10

A clinic provides a program to help their clients to loss weight and ask a consumer agency to investigate the effectiveness of program. The agency takes a sample of 15 people when each person in the sample before the program begin and 3 months later after completing the program. Determine whether the program is effective or not.

Here,

H_0 : There is no significance difference between weights before starting a program and after program i.e., the program was not effective.

H_1 : There is significance difference between weights before starting a program and after program i.e., the program was effective.

THEORY

Paired Sample T-test

The paired sample t-test compares two means that are from the same individual object or related units. The two means typically represents two different times (i.e. before experiment and after experiment) or two different but related conditions or units.

The purpose of the test is to determine whether there is statistical evidence that the mean difference paired observation on a particular outcome is significantly different from zero.

$$t = \frac{\bar{D} - \mu}{\frac{S}{\sqrt{n}}}$$

where,
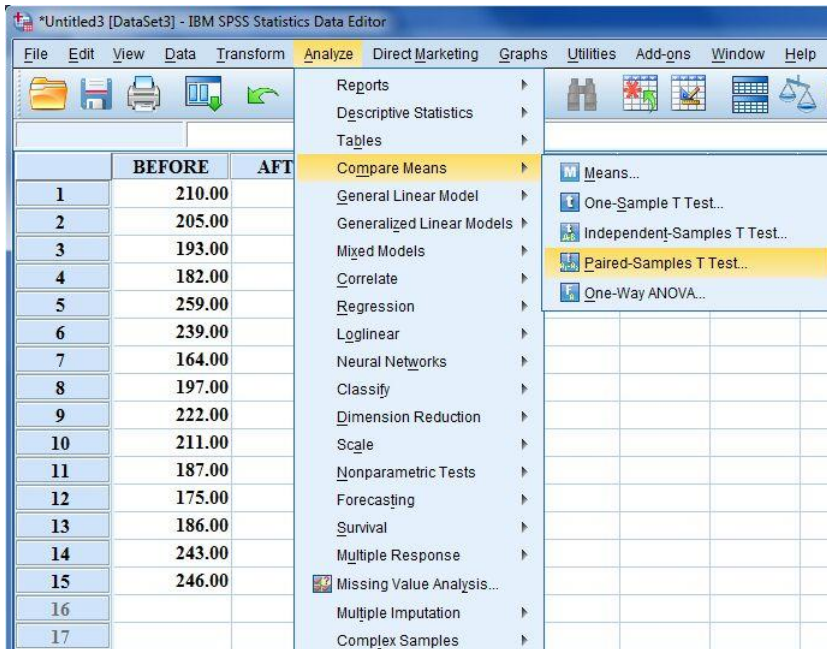
$\bar{D}$ = sample mean

μ = population mean

S = standard deviation

n = sample size

PROCEDURE

Step 1 : Enter the data in SPSS worksheet that you want to test.

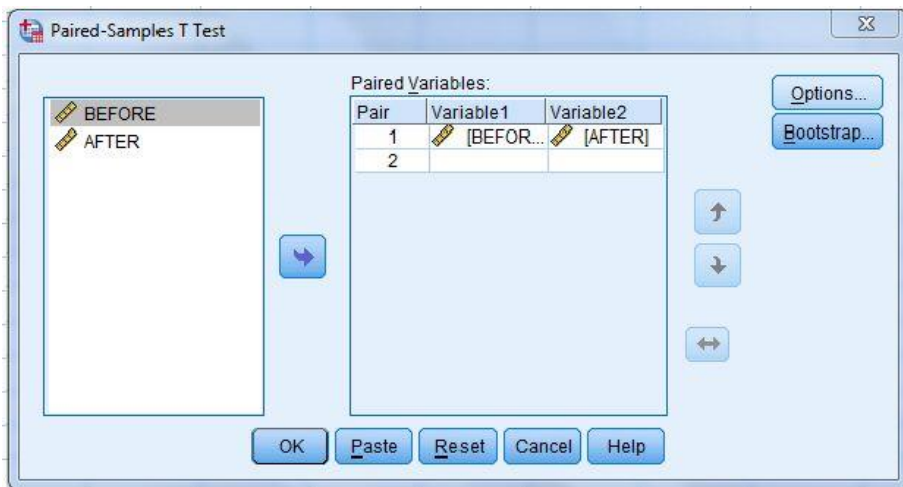Step 2 : Click on "Analyze". Then click on compare mean.

Step 3 : Click on paired – sample t test.

You will get paired – sample t test.

NOTE : As you have specified before test and after test variable.

Step 4 : In paired variables ; drag 1st variable (i.e. before test) in variable 1 and another variable (i.e. after test) in variable 2.

NOTE : Pair column represents the numbers of paired sample t tests to run. You may choose to run multiple paired sample t tests simultaneously by selecting multiple sets of matched variables.

Step 5 : Click on Option and change confidence interval percentage if required.
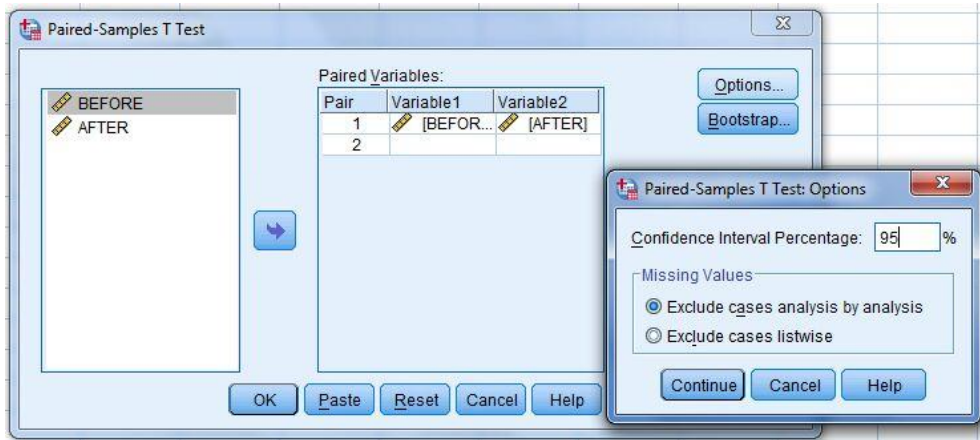
Step 6 : Click on Continue and then click on OK. Interpret the results.

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	BEFORE	207.9333	15	28.56188	7.37465
	AFTER	197.0000	15	24.39262	6.29815

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	BEFORE & AFTER	15	.984	.000

Paired Samples Test

		Paired Differences							
					95% Confidence Interval of the Difference				
		Mean	Std. Deviation	Std. Error Mean	Lower	Upper	t	df	Sig. (2-tailed)
Pair 1	BEFORE - AFTER	10.93333	6.32982	1.63435	7.42799	14.43867	6.690	14	.000