GATHERING THE DATA (USING ONLINE/OFFLINE)

EXPERIMENT -I

Create questioner of Marketing/HR/Revenant Management Stream:

GATHERING PRIMARY DATA

• Primary data collection is a process of collecting original data, directly from the source.

• It is used in research to gather first-hand information about a problem or topic.

• The most common use for primary data is in studies, where researchers need to collect information from experts in their field.

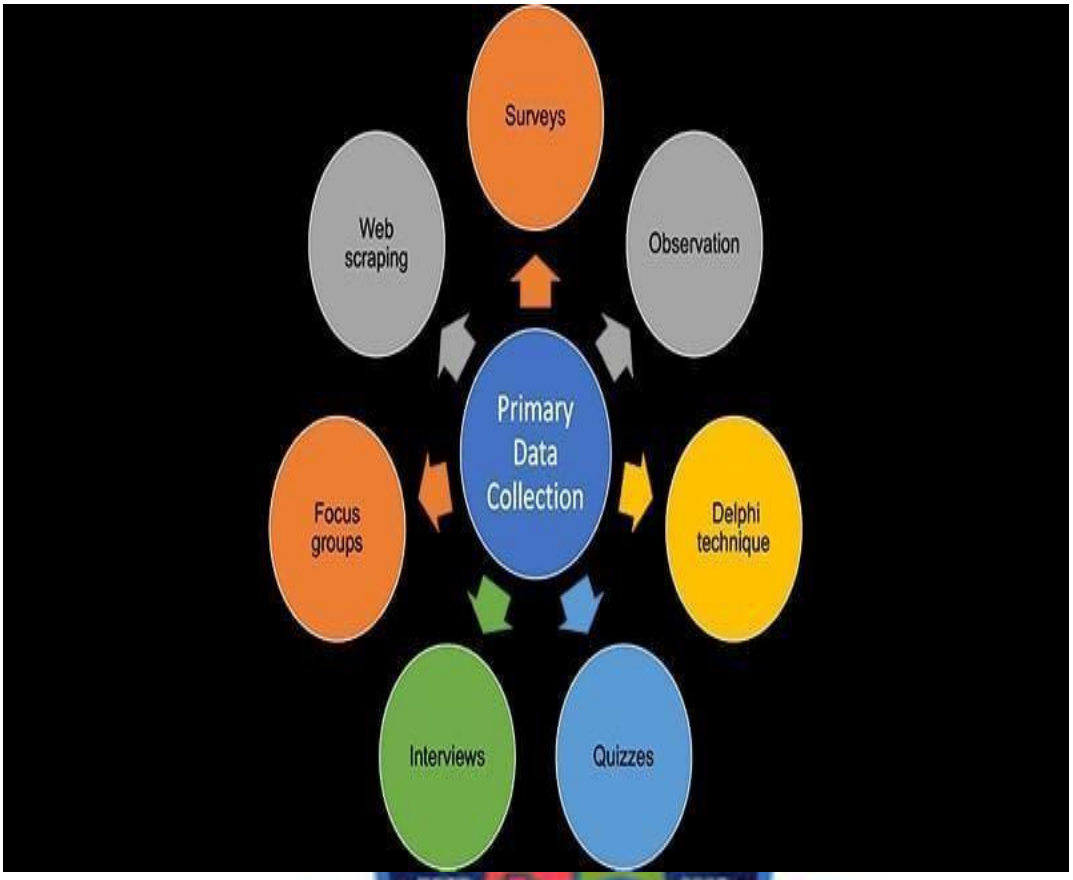
• Offline primary data collection includes:

1. Offline surveys,
2. Interviews,
3. Offline quizzes,
4. Delphi technique,
5. Focus groups
6. Observations.

Online primary data collection includes:

1. Web scraping,
2. Online quizze,
3. Online surveys.

Self-collection includes using social media to collect information Illustration of the most common primary data collection types.



Entering online survey data in to excel

Go to menu

Go back to page

Export Data to MS Excel

Under the Report tab, you analyze aggregate information about your survey responses. To extract raw data, you can navigate to the Data tab and download/export your raw response in the format of your choice.

For example, let's say you'd like your data in an Excel spreadsheet. Not a problem! As soon as you have results, you can seamlessly download survey data into Excel for additional analysis outside the Sogolytics platform at any time. Sogolytics's Data tab gives you instant access to your data in the format that you need.

Below is a step-by-step guide to export survey data in Excel:

Select your survey, then click Data. From the Export options presented, click on Excel.

A pop-up will appear, asking you to prepare your raw data for export. Click Continue to proceed.

As your data is prepared, you can navigate to other sections to complete any other tasks. A confirmation email will be sent to the email address you identified under Settings as a notification when the export process is completed.

Once your data is prepared, click on Export Responses.

You can directly export raw data to Excel once your survey is prepared. You will not need to prepare data for your survey again unless you have received a new response for your survey, excluded a response, or made textual changes to your survey questions.

On the ‘Select Survey Questions’ step, you may choose to select all or selected question for which you would like to export your raw data.

Click on Continue to add additional attributes or click Export Now to export your raw data in Excel.

In the ‘Select Export Attributes’ step, you may customize the attributes to be included. Options include Respondent, Response, and Assessment Attributes. Click Continue to proceed.

Email Address will only be displayed for Unique invitations/Access Codes or survey participation using authentication.

IP address will only be displayed if the survey is not anonymous.

Exclude responses will be enabled only for responses marked as Excluded in an individual report.

Assessment Attributes will be enabled only for surveys under the Assessment Tool.

Under ‘Select Survey Conditions’ step, you can:

Filter responses based on response to a question in your survey

Filter responses based on time period

Next, you can assign codes to your survey. This is typically only useful when you are working with SPSS or other statistical software or need to make textual changes to your question and answer text.

Finally, select the range of responses to export. This step is only necessary if you have more than 10,000 responses, as you may export 10,000 responses at a time. Click Export.

Sorting and Filtering the required shape

Sorting

Excel provides a number of basic capabilities for sorting and filtering data in a worksheet. These capabilities are accessible from the **Data** ribbon.
Example 1: Sort the data in the range A3:D10 of Figure 1 by income

	A	B	C	D
3	Person	Gender	Age	Income
4	Mary	F	35	45000
5	Bob	M	40	40000
6	Jim	M	55	35000
7	Betty	F	25	80000
8	Alan	M	40	35000
9	Debra	F	40	45000
10	Dave	M	60	60000
11	Steve	M	30	35000
12	Jane	F	45	30000

Figure 1 – Data to be sorted

Highlight the range A3:D12 and select **Data > Sort & Filter|Sort**. When the dialog box shown in Figure 2 appears, choose Income for the **Sort by** field and make sure that the **My data has headers** field is checked.

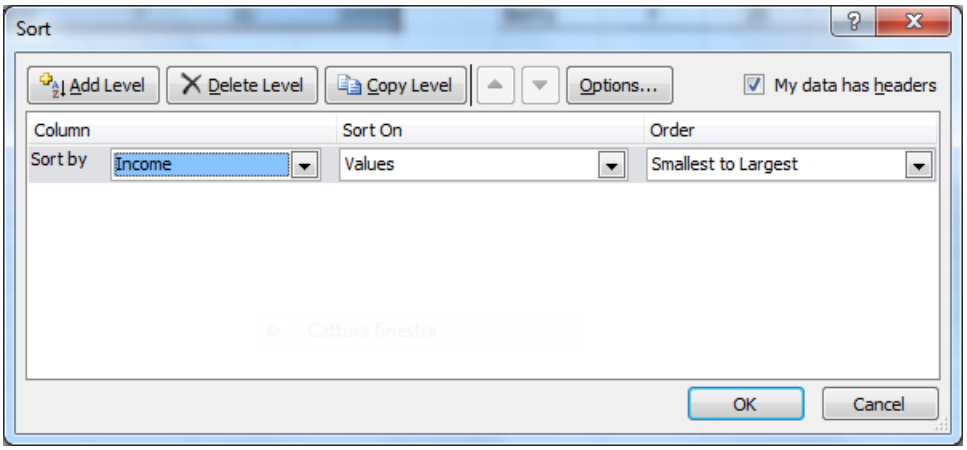


Figure 2 – Sort dialog box

Once you click on the **OK** button the data in range A3:D12 will be overwritten with the data in sorted order as shown in Figure 3.

	A	B	C	D
3	Person	Gender	Age	Income
4	Jane	F	45	30000
5	Jim	M	55	35000
6	Alan	M	40	35000
7	Steve	M	30	35000
8	Bob	M	40	40000
9	Mary	F	35	45000
10	Debra	F	40	45000
11	Dave	M	60	60000
12	Betty	F	25	80000

Figure 3 – Data sorted by Income

Multiple Sorts

Now suppose that in the case of ties we wanted the entries to be sorted in alphabetic order by the person's name. Notice that three people have an income of 35,000 and two have an income of 45,000. In neither case are the entries in alphabetic order by name. To perform a multilevel sort you need to press **Add Level** button in Figure 2. The dialog box will change to give you the opportunity to supply two sort keys. Fill in the entries as shown in Figure 4.

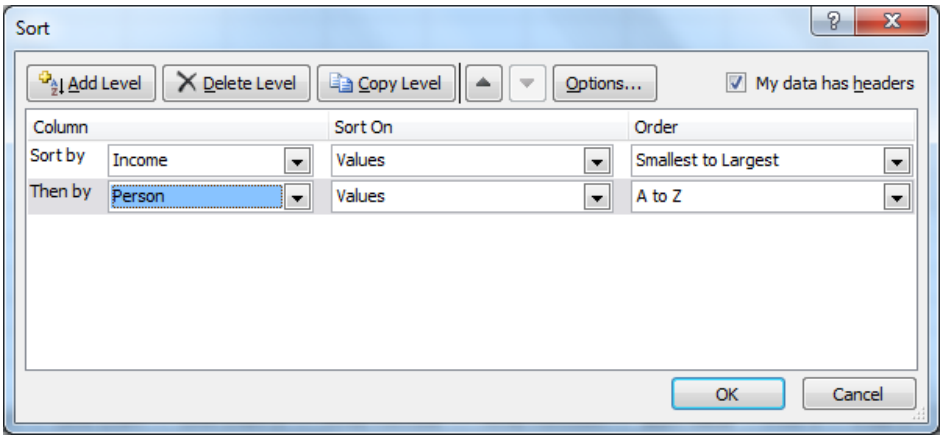


Figure 4 – Multiple level sort

This time the data will be sorted as shown in Figure 5.

	A	B	C	D
3	Person	Gender	Age	Income
4	Jane	F	45	30000
5	Alan	M	40	35000
6	Jim	M	55	35000
7	Steve	M	30	35000
8	Bob	M	40	40000
9	Debra	F	40	45000
10	Mary	F	35	45000
11	Dave	M	60	60000
12	Betty	F	25	80000

Figure 5 – Data sorted by Income/name

EXPERIMENT II

Collecting and Entering the Secondary Data:

Secondary data refers to data that is collected by someone other than the primary user. Common sources of secondary data for social science include censuses, information collected by government departments, organizational records and data that was originally collected for other research purposes. Primary data, by contrast, are collected by the investigator conducting the research.

Secondary data analysis can save time that would otherwise be spent collecting data and, particularly in the case of quantitative data, can provide larger and higher-quality databases that would be unfeasible for any individual researcher to collect on their own. In addition, analysts of social and economic

change consider secondary data essential, since it is impossible to conduct a new survey that can adequately capture past change and/or developments.

However, secondary data analysis can be less useful in marketing research, as data may be outdated or inaccurate.

Sources of Secondary Data:

Secondary data can be obtained from many sources:

- censuses and government departments like housing, social security, electoral statistics, tax records
- internet searches and libraries
- GPS and remote sensing
- km progress reports
- journals, newspapers and magazines

Advantages and Disadvantages of Secondary Data:

Secondary data is available from other sources and may already have been used in previous research, making it easier to carry out further research. It is time-saving and cost-efficient: the data was collected by someone other than the researcher. Administrative data and census data may cover both larger and much smaller samples of the population in detail. Information collected by the government will also cover parts of the population that may be less likely to respond to the census (in countries where this is optional).

A clear benefit of using secondary data is that much of the background work needed has already been carried out, such as literature reviews or case studies. The data may have been used in published texts and statistics elsewhere, and the data could already be promoted in the media or bring in useful personal contacts. Secondary data generally have a pre-established degree of validity and reliability which need not be re-examined by the researcher who is re-using such data. Secondary data is key in the concept of data enrichment, which is where datasets from secondary sources are connected to a research dataset to improve its precision by adding key attributes and values.

Secondary data can provide a baseline for primary research to compare the collected primary data results to and it can also be helpful in research design.

However, secondary data can present problems, too. The data may be out of date or inaccurate. If using data collected for different research purposes, it may not cover those samples of the population researchers want to examine, or not in sufficient detail. Administrative data, which is not originally collected for research, may not be available in the usual research formats or may be difficult to get access to.

STATISTICAL ANALYSIS (USING EXCEL/SPSS//R-STUDIO OPEN-SOURCE ONLINE TOOLS)

EXPERIMENT III

Formulation of Hypothesis

The hypothesis is a predictive, testable statement predicting the outcome and the results the researcher expects to find.

Importance of Hypothesis in Research

The purpose of including hypotheses in psychology research is:

- to provide a summary of what the researcher is and how investigating a theory and what is expected to be found
- to provide an answer to the research question

When carrying out research the first step that researchers take is to investigate the research area that they are interested in. From this researchers, are required to identify a gap in the literature. Filling the gap essentially means finding what previous work has not been explained yet, investigated to a sufficient degree, or simply expanding or further investigating a theory if doubt is present.

The researcher then forms a research question that the researcher will attempt to answer in their study.

Steps in the Formulation of Hypothesis in Research Methodology

All researchers will likely complete the following

- Investigating background research in the area of interest
- Formulating or investigating a theory
- Identify how the theory will be tested and what the researcher expects to find based on relevant, previously published scientific works

What is Univariate Analysis?

Univariate analysis is the simplest form of analyzing data. “Uni” means “one”, so in other words your data has only one variable. It doesn’t deal with

causes or relationships (unlike regression) and it's major purpose is to describe; It takes data, summarizes that data and finds patterns in the data.

What is a variable in Univariate Analysis?

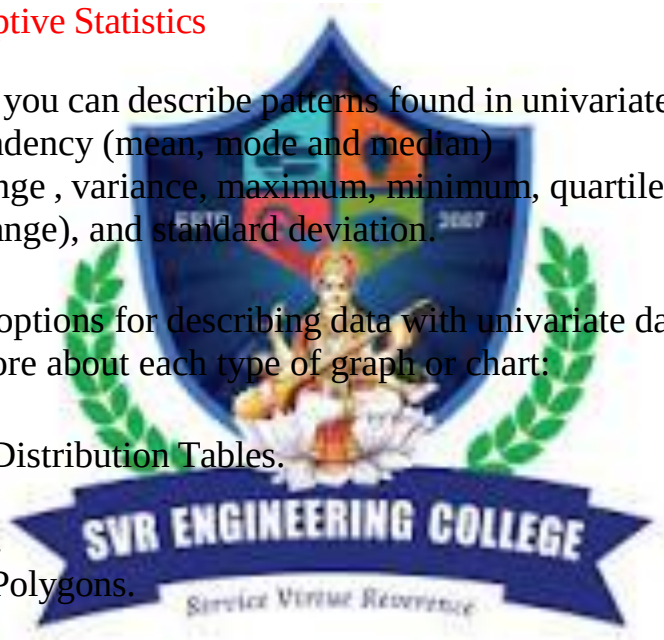
A variable in univariate analysis is just a condition or subset that your data falls into. You can think of it as a "category." For example, the analysis might look at a variable of "age" or it might look at "height" or "weight". However, it doesn't look at more than one variable at a time otherwise it becomes bivariate analysis (or in the case of 3 or more variables it would be called multivariate analysis).

Univariate Descriptive Statistics

Some ways you can describe patterns found in univariate data include central tendency (mean, mode and median) and dispersion: range , variance, maximum, minimum, quartiles (including the interquartile range), and standard deviation.

You have several options for describing data with univariate data. Click on the link to find out more about each type of graph or chart:

- Frequency Distribution Tables.
- Bar Charts.
- Histograms.
- Frequency Polygons.
- Pie Charts.



Calculating univariate descriptive statistics

Use univariate descriptive statistics to describe a quantitative variable.

1. Select a cell in the dataset.
2. On the **Analyse-it** ribbon tab, in the **Statistical Analyses** group, click **Distribution**, and then click the statistics to show:

Option	Description
Mean and Moments	Show mean, variance, standard deviation, skewness, and kurtosis.

Option	Description
Median and Quartiles	Show minimum, maximum, median, and quartiles.
Quantiles	Show quantiles.

3. The analysis task pane opens.
4. In the **Y** drop-down list, select the variable.
5. **Optional:** To customize the statistics to show, click **Customize...** and then select or clear the appropriate check boxes. To save the options as the defaults to use for future analyses, click **Save as Defaults**.
6. Click **Calculate**.

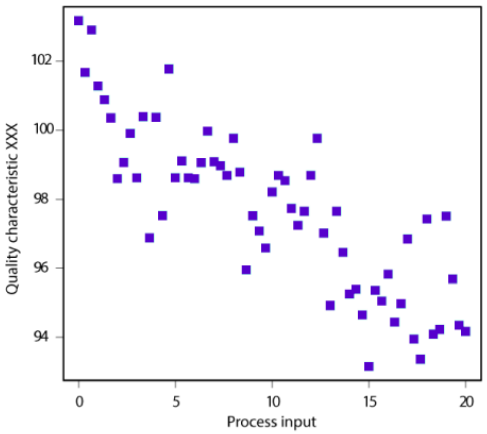
EXPERIMENT IV

Bi Variable

Bivariate analysis is one of the statistical analyses where two variables are observed. One variable here is dependent while the other is independent. These variables are usually denoted by X and Y. So, here we analyse the changes occurred between the two variables and to what extent. Apart from bivariate, there are other two statistical analyses, which are Univariate (for one variable) and Multivariate (for multiple variables).

Definition of Bivariate Analysis

Bivariate analysis is stated to be an analysis of any concurrent relation between two variables or attributes. This study explores the relationship of two variables as well as the depth of this relationship to figure out if there are any discrepancies between two variables and any causes of this difference. Some of the examples are percentage table, scatter plot, etc.



Scatterplot for quality characteristic XXX

For analysis, it is necessary to recognise bivariate data first. Usually, the data comprises two measurements such as X and Y. For each measurement, the bivariate data can be interpreted as the pair (X, Y). These variables are often called **bivariate simple random sample (SRS)**. We can denote these variables as (X_1, Y1), (X_2, Y2),…..,(X_n,Y_n). The bivariate data can be represented in a table as shown below:

(X_n, Yn). The bivariate data can be represented in a table as shown below :

Observations	X-Variable	Y-Variable
1	10	5
2	5	4
3	6	3
4	8	2
5	4	-5

Types of Bivariate Analysis

The types of a bivariate analysis will depend upon the types of variables or attributes we will use for analysing. The variable could be numerical, categorical or ordinal. If the independent variable is categorical, like a particular brand of pen, then logit or probit regression can be used. If independent and dependent both the attributes are ordinal, which means they have position or ranking, then we can measure a rank correlation coefficient. If dependent attribute is ordinal, then ordered logit or ordered probit can be utilised. Also, if the dependent attribute is either ratio or interval, like temperature scale, then we can measure regression. So based on these data, we can mention the types of bivariate data analysis:

1. Numerical and Numerical – In this type, both the variables of bivariate data, independent and dependent, are having numerical values.

2. Categorical and Categorical – When both the variables are categorical.

3. Numerical and Categorical – When one variable is numerical and one is categorical.

What is multivariate analysis?

In data analytics, we look at different variables (or factors) and how they might impact certain situations or outcomes. For example, in marketing, you might look at how the variable "money spent on advertising" impacts the variable "number of sales." In the healthcare sector, you might want to explore whether there's a correlation between "weekly hours of exercise" and "cholesterol level." This helps us to understand why certain outcomes occur, which in turn allows us to make informed predictions and decisions for the future.

There are three categories of analysis to be aware of:

- **Univariate analysis**, which looks at just one variable
- **Bivariate analysis**, which analyzes two variables
- **Multivariate analysis**, which looks at more than two variables

As you can see, multivariate analysis encompasses all statistical techniques that are used to analyze more than two variables at once. The aim is to find patterns and **correlations** between several variables simultaneously—allowing for a much deeper, more complex understanding of a given scenario than you'll get with bivariate analysis.

Interpretation of Result

The Interpretation (or Discussion) section of the systematic review helps readers interpret the main findings of the review, brought together in the synthesis step.

The interpretation should include:

- Statement of principal findings

- An analysis of those findings (for example, on what strength of the evidence, are the review's conclusions being made?)
- The strengths and weaknesses of the review
- A statement that places the findings in the context of the existing evidence base, particularly in relation to any existing relevant systematic reviews.

EXPERIMENT V

VISUALISATION OF DATA

CHART

A **chart** (sometimes known as a **graph**) is a graphical representation for data visualization, in which "the data is represented by symbols, such as bars in a bar chart, lines in a line chart, or slices in a pie chart". A chart can represent tabular numeric data, functions or some kinds of quality structure and provides different info.

The term "chart" as a graphical representation of data has multiple meanings:

- A data chart is a type of diagram or graph that organizes and represents a set of numerical or qualitative data.
- Maps that are adorned with extra information (map surround) for a specific purpose are often known as charts, such as a nautical chart or aeronautical chart, typically spread over several map sheets.
- Other domain-specific constructs are sometimes called charts, such as the chord chart in music notation or a record chart for album popularity.

Rules for creating charts

1. Ask yourself a question: Start off by determining what it is that you're looking for. What answer should the chart provide, and start building around that.
2. Know your audience: Consider who's going to view your graph and what they'll be trying to get out of it.
3. Make sure your data is on point: The set of information you're dealing with constitutes the basis for all the charts and graphs you design.

4. Choose the most suitable representation for the data: When trying to decide which chart type to use, think in terms of what the audience needs to learn from it.

5. Color scheme: Even though it may seem like a negligible part of the process at first, choosing colors that go well together is no small matter.

6. Explain encodings**:** Whether you're using a color scale for magnitude, the size of a square to show particular values, or maybe a combination of other styles, you want to explain to your audience what your encoding is supposed to mean.

7. Emphasize the important part: The focus can be achieved in a variety of ways including the color, size, or weight of the elements/indicators, as well as bolding or circling some of the information pieces.

8. Consider the UX aspects:

- Sticking to 2D as 3D is difficult to navigate, creates overlap issues, and looks bad in print.
- Providing easy navigation with touch and gesture support if you expect mobile use.
- Making the chart interactive to allow users to better understand the data and discover more.
- Offering filters for sifting through the data. Users may need to scale things down to notice patterns or focus only on specific parts.
- Avoiding too much animation as it can be distracting and overloading the senses.

9. Include sourcing**:** when creating your graph, don't get too caught up in all the arrows, columns, and other objects. Remember to always finish off your design with sources for the presented information.

10. Make your chart design stand out: There are many ways to make your data visualization emphasize the point and be remembered. Creativity is boundless and in this context goes beyond the stiff frames of particular chart types.

Add a chart title

1. In the chart, select the "Chart Title" box and type in a title.
2. Select the + sign to the top-right of the chart.
3. Select the arrow next to **Chart Title**.
4. Select **Centered Overlay** to lay the title over the chart, or **More Options** for additional choices.
5. Right-click the chart title to format it with options like **Fill** or **Outline**.

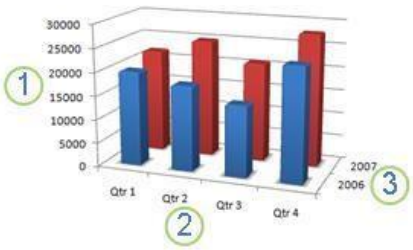
Remove a chart title

1. Click on the chart.
2. Select the + sign to the top-right of the chart.
3. Uncheck the checkbox next to **Chart Title**.

Axis of the Chart

Charts typically have two axes that are used to measure and categorize data: a vertical axis (also known as value axis or y axis), and a horizontal axis (also known as category axis or x axis). 3-D column, 3-D cone, or 3-D pyramid charts have a third axis, the depth axis (also known as series axis or z axis), so

that data can be plotted along the depth of a chart. Radar charts do not have horizontal (category) axes, and pie and doughnut charts do not have any axes.



1. Vertical (value) axis

2. Horizontal (category) axis

3. Depth (series) axis

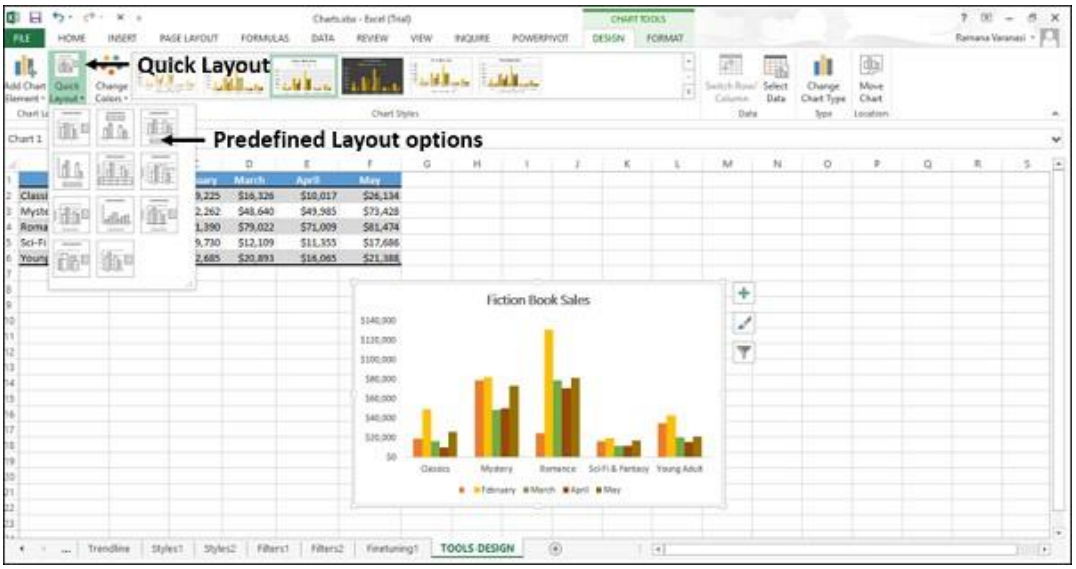
The following describe how you can modify your charts to add impact and better convey information. For more info on what axes are and what you can do with them, see all about axes.

EXPERIMENT VI

Quick Layout

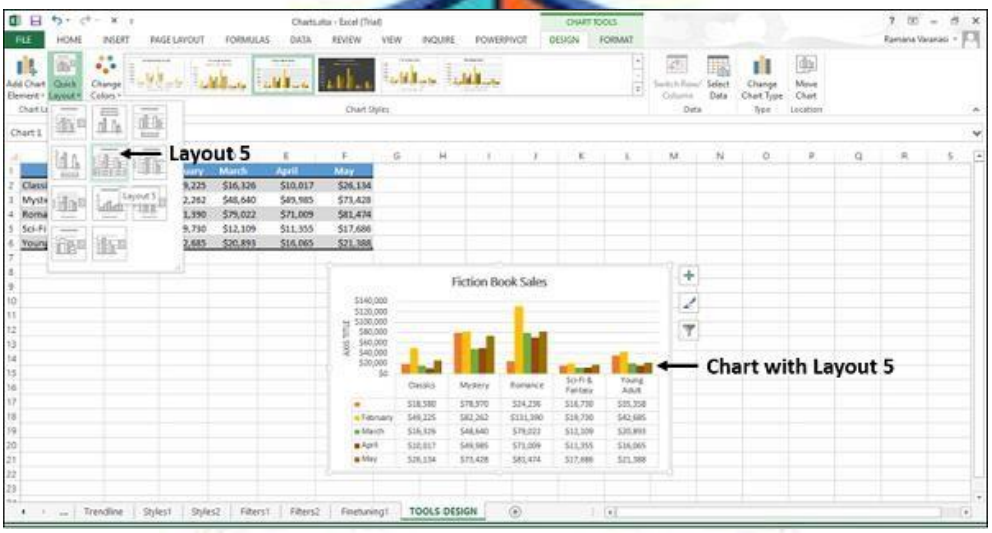
You can use Quick Layout to change the overall layout of the chart quickly by choosing one of the predefined layout options.

Step 1 − On the Ribbon, click Quick Layout. Different predefined layout options will be displayed.



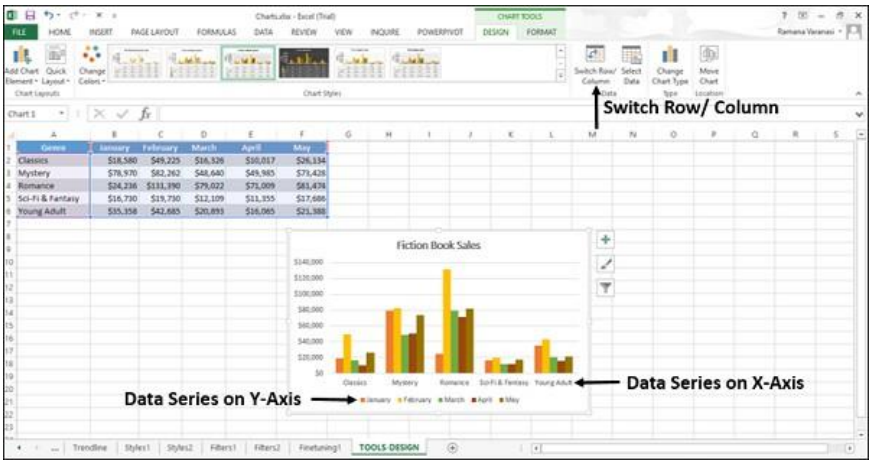
Step 2 − Move the pointer across the predefined layout options. The chart layout changes dynamically to the particular option.

Step 3 − Select the layout you want. The chart will be displayed with the chosen layout.

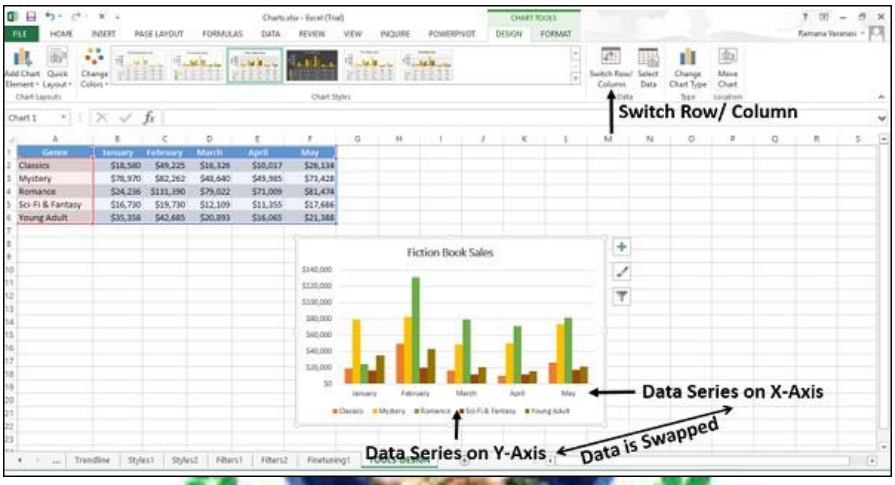


Switch Row/Column

You can use Switch Row/Column to change the data being displayed on X-axis to be displayed on Y-axis and vice versa.



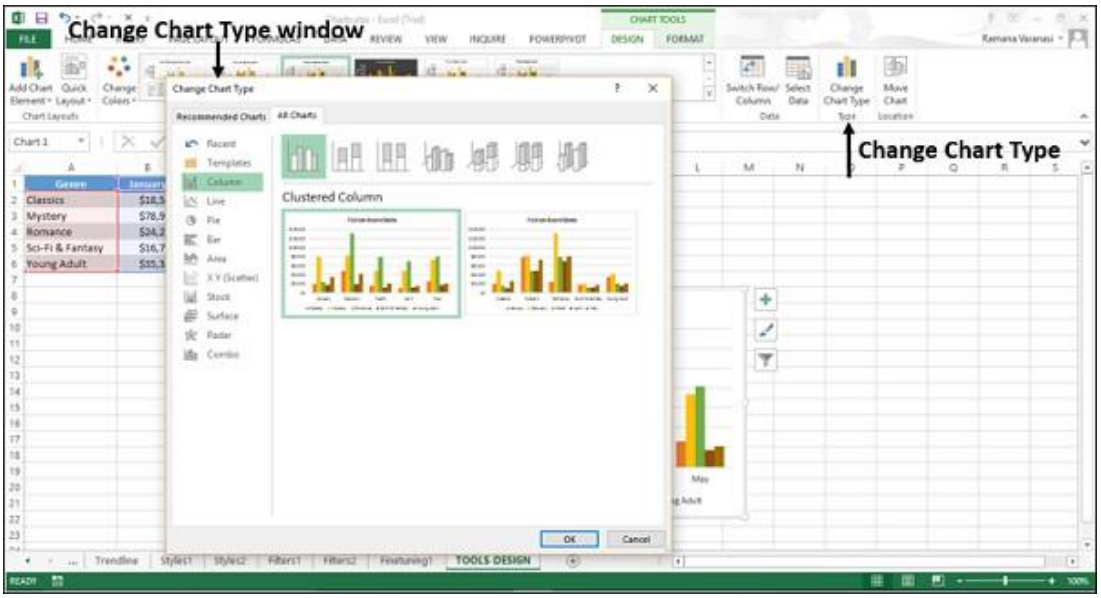
Click Switch Row / Column. The data will be swapped between X-axis and Y-axis on the chart.



Change Chart Type

You can use the Change Chart Type button to change your chart to a different chart type.

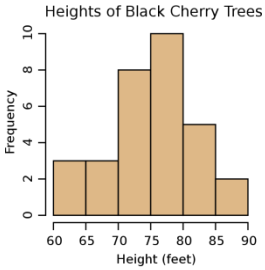
Step 1 − Click Change Chart Type. A Change Chart Type window appears.



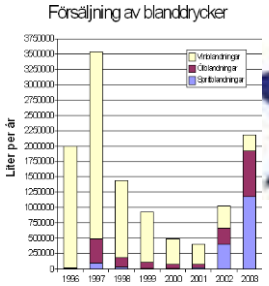
Step 2 − Select the chart type you want.

Your chart will be displayed with the chart type you want.

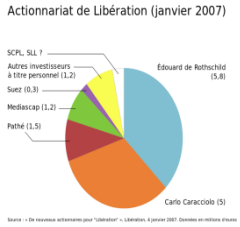
TYPES OF CHARTS



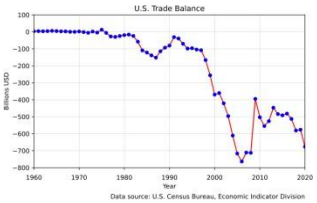
A histogram consists of tabular frequencies, shown as adjacent rectangles, erected over discrete intervals (bins), with an area equal to the frequency of the observations in the interval.



A bar chart is a chart with rectangular bars with lengths proportional to the values that they represent. The bars can be plotted vertically or horizontally.

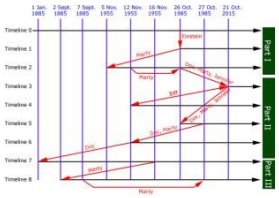


A pie chart shows percentage values as a slice of a pie.

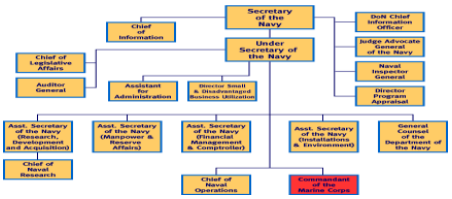


A line chart is a two-dimensional scatter plot of ordered observations where the observations are connected following their order.

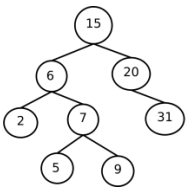
TIMELINE CHART



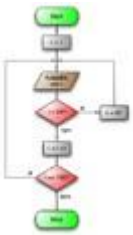
ORGANISATIONAL CHART



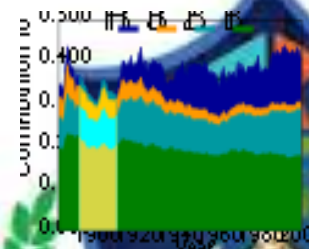
TREECHART



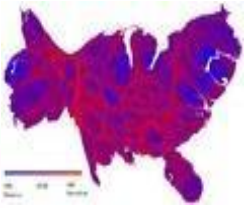
FLOW CHART



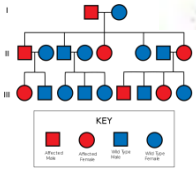
AREA CHART



CARTOGRAM



PEDIGREE CHART



RADIAL TREE

EXPERIMENT VII

DATABASE CREATION

To create a database

1. In **Object Explorer**, connect to an instance of the SQL Server Database Engine and then expand that instance.
2. Right-click **Databases** and then select **New Database**.
3. In **New Database**, enter a database name.
4. To create the database by accepting all default values, select **OK**; otherwise, continue with the following optional steps.
5. To change the owner name, select (**...**) to select another owner.
6. To change the default values of the primary data and transaction log files, in the **Database files** grid, select the appropriate cell and enter the new value. For more information, see Add Data or Log Files to a Database.
7. To change the collation of the database, select the **Options** page, and then select a collation from the list.
8. To change the recovery model, select the **Options** page and select a recovery model from the list.
9. To change database options, select the **Options** page, and then modify the database options. For a description of each option, see ALTER DATABASE SET Options (Transact-SQL).
10. To add a new file group, select the **File groups** page. Select **Add** and then enter the values for the file group.
11. To add an extended property to the database, select the **Extended Properties** page.

    a. In the **Name** column, enter a name for the extended property.
    b. In the **Value** column, enter the extended property text. For example, enter one or more statements that describe the database.

12. To create the database, select **OK**.

Human resource databases refer to data related to organization, employees etc which is stored in one place.

Data stored in the HR database includes employees details like personal information, training, salary details, reimbursement, worksheet, time chart etc.

Secondly, data related to recruitment, transportation, expenses, clients, customer relationship management, finance, production etc.

Human resource databases include any form of data that is needed for the smooth functioning of human resource management.

Creating a database

When you open Access, Backstage view displays the **New** tab. The **New** tab provides several ways that you can create a new database:

- **A blank database** You can start from scratch if you want. This is a good option if you have very specific design requirements or have existing data that you need to accommodate or incorporate.
- **A template that is installed with Access** Consider using a template if you are starting a new project and would like a head start. Access comes with several templates installed by default.
- **A template from Office.com** In addition to the templates that come with Access, you can find many more templates on Office.com. You don't even have to open a browser; the templates are available from the **New** tab.

Create a blank database

1. On the **File** tab, click **New**, and then click **Blank Database**.
2. Type a file name in the **File Name** box. To change the location of the file from the default, click **Browse for a location to put your database** (next to the **File Name** box), browse to the new location, and then click **OK**.
3. Click **Create**.

   Access creates the database with an empty table named Table1, and then opens Table1 in Datasheet view. The cursor is placed in the first empty cell in the **Click to Add** column.

4. Begin typing to add data, or you can paste data from another source, as described in the section Copy data from another source into an Access table.

Create a table, starting in Datasheet view

In Datasheet view, you can enter data immediately and let Access build the table structure behind the scenes. Field names are assigned numerically (Field1, Field2, and so on), and Access automatically sets each field's data type, based on the data you enter.

1. On the **Create** tab, in the **Tables** group, click **Table**.

   Access creates the table and selects the first empty cell in the **Click to Add** column.

2. On the **Fields** tab, in the **Add & Delete** group, click the type of field that you want to add. If you don't see the type that you want, click **More Fields** .
3. Access displays a list of commonly used field types. Click the field type that you want, and Access adds the new field to the datasheet at the insertion point.

   You can move the field by dragging it. When you drag a field in a datasheet, a vertical insertion bar appears where the field will be placed.

4. To add data, begin typing in the first empty cell, or paste data from another source, as described in the section Copy data from another source into an Access table.
5. To rename a column (field), double-click the column heading, and then type the new name.

   You should give a meaningful name to each field, so that you can tell what it contains when you see it in the **Field List** pane.

6. To move a column, click its heading to select the column, and then drag the column to the location that you want. You can also select multiple contiguous columns and then drag them to a new location all at once. To select multiple contiguous columns, click the column header of the first column, and then, while holding down SHIFT, click the column header of the last column.

EXPERIMENT VIII

Create a table, starting in Design view In Design view, you first create the table structure. You then switch to Datasheet view to enter data, or enter data by using some other method, such as pasting, or importing.

1. On the **Create** tab, in the **Tables** group, click **Table Design**.
2. For each field in your table, type a name in the **Field Name** column, and then select a data type from the **Data Type** list.
3. If you want, you can type a description for each field in the **Description** column. The description is then displayed on the status bar when the cursor is located in that field in Datasheet view. The description is also used as the status bar text for any controls in a form or report that you create by dragging the field from the **Field List** pane, and for any controls that are created for that field when you use the Form Wizard or Report Wizard.

4. After you have added all of your fields, save the table:
   - On the **File** tab, click **Save**.
5. You can begin typing data in the table at any time by switching to Datasheet view and clicking in the first empty cell. You can also paste data from another source, as described in the section Copy data from another source into an Access table.

Set field properties in Design view Regardless of how you created your table, it is a good idea to examine and set field properties. While some properties are available in Datasheet view, some properties can only be set in Design view. To switch to Design view, right-click the table in the Navigation Pane and then click **Design View**. To see a field's properties, click the field in the design grid. The properties are displayed below the design grid, under **Field Properties**.

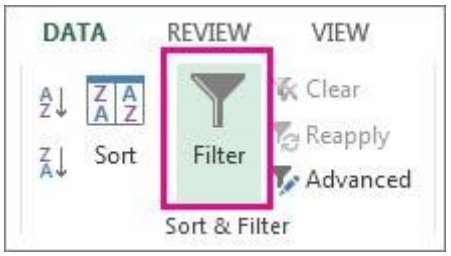
To see a description of each field property, click the property and read the description in the box next to the property list under **Field Properties**. You can get more detailed information by clicking the Help button.

Filter the data

Use AutoFilter or built-in comparison operators like "greater than" and “top 10” in Excel to show the data you want and hide the rest. Once you filter data in a range of cells or table, you can either reapply a filter to get up-to-date results, or clear a filter to redisplay all of the data.

Filter a range of data

1. Select any cell within the range.
2. Select **Data** > **Filter**.



Create Models Using Marketing Data

A data model is a conceptual representation of various metrics that you need to track.

A marketing data model organizes elements of data that your campaigns collect to determine how those elements relate to each other, allowing you to spot relationships, glean insights, and determine how to improve results by making changes to your marketing strategy.

In short, data modelling is the process of identifying, analyzing, displaying, and communicating data sets, allowing them to be more easily understood so that you can use them to make marketing decisions.

Below, we'll discuss how different types of data modelling methods are used by digital marketers.

Customer Personas

A customer persona is the fundamental archetype of your ideal, target consumer. By using data modelling techniques, you can construct the ideal customer, determining all the different features they exhibit (from age to marital status, to household income, to interests, etc.), to help determine WHO exactly you should be targeting with your marketing dollars.

Engagement

After determining your target audience, running campaigns against them, and collecting the resulting performance data, you can now leverage data modelling strategies to measure their engagement, understand which parts of your campaign are working (as well as why they're working), so that you can uncover insights that will lead to better results in the future.

Optimization

Marketing optimization is all about leveraging the data you've collected to uncover learning's that can help enhance your marketing decisions, and therefore, results.

Internal Rate of Return (IRR)

Internal Rate of Return is the interest rate that makes the ***Net Present Value Zero.***

And that "guess and check" method is the common way to find it (though in that simple case it could have been worked out directly).

STEPS OF CALCULATION OF IRR

Step 1: Select 2 discount rates for the calculation of NPVs

You can start by selecting any 2 discount rates on a random basis that will be used to calculate the net present values in Step 2.

It is important not to select discount rates that are ridiculously distant from the IRR (e.g. 10% and 90%) as it could undermine accuracy.

Step 2: Calculate NPVs of the investment using the 2 discount rates
You shall now calculate the net present values of the investment on the basis of each discount rate selected in Step 1.
Step 3: Calculate the IRR
Using the 2 discount rates from Step 1 and 2 calculate net present values . Then you shall calculate the IRR
Step 4: Interpretation
The decision rule for IRR is that an investment should only be selected where the cost of capital (WACC) is lower than the IRR.
The decision rule above will lead to the same conclusion as the NPV analysis where only one investment is being considered.

EXPERIMENT IX

INTRODUCTION TO MS-ACCESS & SPSS

Microsoft Access is a Database Management System (DBMS) from Microsoft that combines the relational Microsoft Jet Database Engine with a graphical user interface and softwaredevelopment tools. It is a member of the Microsoft Office suite of applications, included in the professional and higher editions.

- Microsoft Access is just one part of Microsoft's overall data management product strategy.
- It stores data in its own format based on the Access Jet Database Engine.
- Like relational databases, Microsoft Access also allows you to link related information easily. For example, customer and order data. However, Access 2013 also complements other database products because it has several powerful connectivity features.
- It can also import or link directly to data stored in other applications and databases.
- As its name implies, Access can work directly with data from other sources, including many popular PC database programs, with many SQL (Structured Query Language) databases on the desktop, on servers, on minicomputers, or on mainframes, and with data stored on Internet or intranet web servers.
- Access can also understand and use a wide variety of other data formats, including many other database file structures.
- You can export data to and import data from word processing files, spreadsheets, or database files directly.
- Access can work with most popular databases that support the Open Database Connectivity (ODBC) standard, including SQL Server, Oracle, and DB2.

- Software developers can use Microsoft Access to develop application software.

Microsoft Access stores information which is called a database. To use MS Access, you will need to follow these four steps −

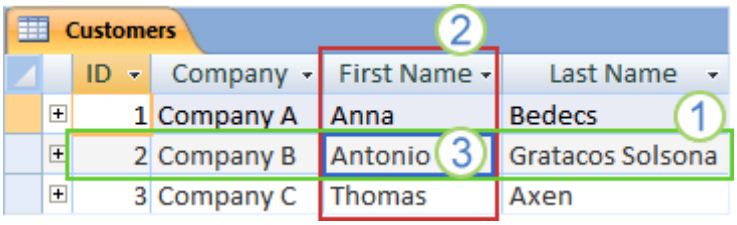
- **Database Creation** − Create your Microsoft Access database and specify what kind of data you will be storing.
- **Data Input** − After your database is created, the data of every business day can be entered into the Access database.
- **Query** − This is a fancy term to basically describe the process of retrieving information from the database.
- **Report** (optional) − Information from the database is organized in a nice presentation that can be printed in an Access Report.

Tables

Tables are essential objects in a database because they hold all the information or data. For example, a database for a business can have a Contacts table that stores the names of their suppliers, e-mail addresses, and telephone numbers. Because other database objects depend so heavily on tables, you should always start your design of a database by creating all of its tables and then creating any other objects. Before you create tables, consider your requirements and determine all the tables that you might need. For an introduction to planning and designing a database, see Database design basics.

Overview

A relational database like Access usually has several related tables. In a well-designed database, each table stores data about a particular subject, such as employees or products. A table has records (rows) and fields (columns). Fields have different types of data, such as text, numbers, dates, and hyperlinks.



1. A record: Contains specific data, like information about a particular employee or a product.
2. A field: Contains data about one aspect of the table subject, such as first name or e-mail address.

3. A field value: Each record has a field value. For example, Contoso, Ltd. or someone@example.com.

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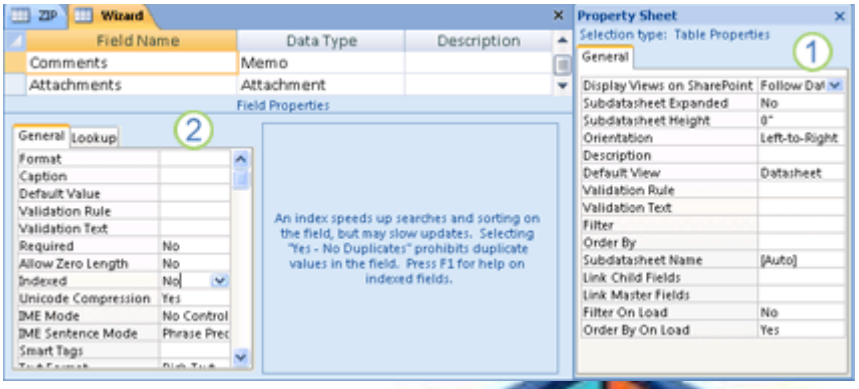
Table and field properties

Tables and fields also have properties that you can set to control their characteristics or behavior.



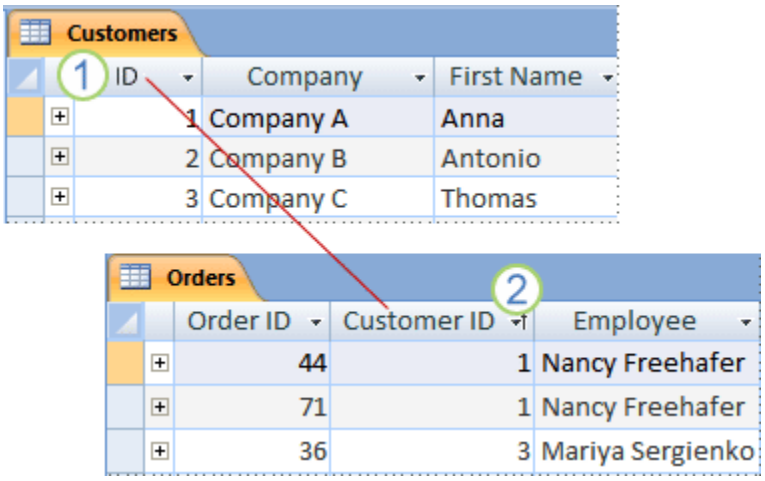
1. Table properties

2. Field properties

EXPERIMENT X

Overview of primary keys in Access

Access uses primary key fields to quickly associate data from multiple tables and combine that data in a meaningful way. You can include the primary key fields in other tables to refer back to the table that is the source of the primary key. In those other tables, the fields are called foreign keys. For example, a Customer ID field in the Customers table might also appear in the Orders table. In the Customers table, it is the primary key. In the Orders table it is called a foreign key. A foreign key, simply stated, is another table's primary key. For more information, see Database design basics.



1. Primary key

2. Foreign key

If you are moving existing data into a database, you may already have a field that you can use as the primary key. Often, a unique identification number, such as an ID number or a serial number or code, serves as a primary key in a table. For example, you might have a Customers table where each customer has a unique customer ID number. The customer ID field is the primary key.

Access automatically creates an index for the primary key, which helps speed up queries and other operations. Access also ensures that every record has a value in the primary key field, and that it is always unique.

When you create a new table in Datasheet view, Access automatically creates a primary key for you and assigns it a field name of "ID" and the AutoNumber data type.

What makes a good primary key?

A good candidate for a primary key has several characteristics:

- It uniquely identifies each row
- It is never empty or null — it always contains a value
- The values it contains rarely (ideally, never) change

The Ribbon contains a series of command tabs. In MS-Access 2007, the main command tabs are as follows: Read more on Sarthaks.com - https://www.sarthaks.com/125723/explain-ms-access-ribbon

• Home

• Create

• External Data

• Database Tools

When you first start Access, or if you close a database without closing Access, Microsoft Office Backstage view is displayed.

Backstage view is a starting point from which you can create a new database, open an existing database, view featured content from Office.com — anything you can use Access to do *to* a database file or *outside* of a database, as opposed to *within* a database.

Creating a database

When you open Access, Backstage view displays the **New** tab. The **New** tab provides several ways that you can create a new database:

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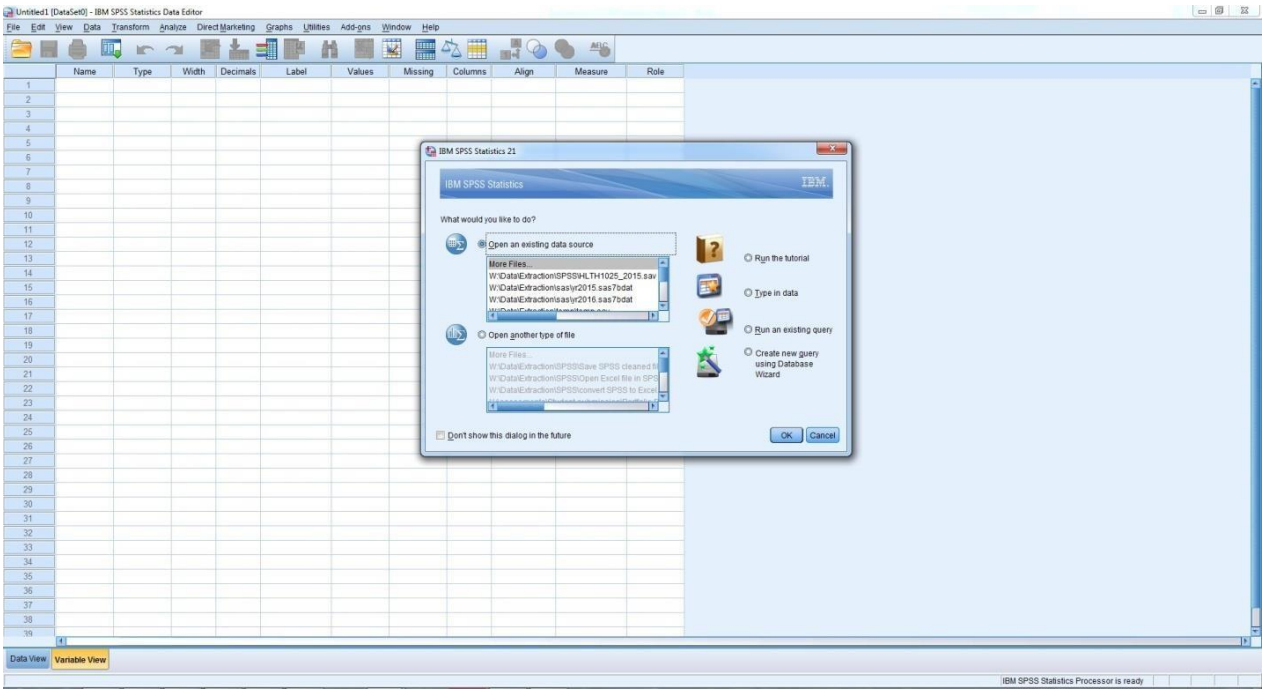
What is SPSS?

SPSS (Statistical Package for the 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 the 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 other more common statistical packages include Stata and SAS (and there are many others). The focus for this session, however, is on SPSS.



SPSS automatically assumes that you want to open an existing file, and immediately opens a dialogue box to ask which file you'd like to open. It'll make it easier to navigate the interface and windows in SPSS if we open a file.

We're going to open and use from data collected as part of a first-year course at UniSA, called Health and Society (H&S). The data we are going to use were collected at the beginning of 2016. So let's first open our demonstration data set – the 2016 H&S student health survey data.

Internet-based data collection

The SDMC licenses an advanced survey software package, DatStat Illume, that can manage all aspects of internet-based surveys, including e-mailing invitations to potential study participants, sending reminder emails, and reporting results. The software supports programming surveys with complex skip patterns, multiple drafts, and frequent changes of survey instruments. Survey responses and survey administration variables (e.g., date of completion, time to complete, number of items presented, number of items answered, etc.) are easily extracted and exported to other programs for analysis. Illume also incorporates robust data security safeguards, ensuring compliance with HIPAA requirements and other laws and regulations governing privacy of health and other personal information. The SDMC also serves as the DFCI institutional support group for REDCap Survey software.

Data entry

The SDMC offers advanced capabilities for efficient and accurate data entry with quality assurance measures that ensure a clean data set prior to analysis. For some projects, data entry is conducted through automated form scanning using ReMark OCR software.

Data analysis

The Core provides investigators with descriptive statistical reports as well as univariate and bivariate statistical analyses. The Core maintains Wincross software that produces timely data reports, including sub-group analysis and statistical testing. The Core also works with biostatisticians to preparing and develop datasets in SAS and SPSS for advanced statistical analysis.

Main features of spss package

- Basic hypothesis testing.
- Bootstrapping.
- Cluster analysis.
- Data preparation, charts and graphing.
- Descriptive statistics.
- Programmability extension.
- ROC analysis.
- Statistical procedures.