# Computerized Data Analysis

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Today, researchers increasingly use computer assisted data analysis packages to assist them. The advantage of software is that it allows far more efficient and effective work processes: It saves you time and can help you to gain deeper insights into your data that you might have missed otherwise. Qualitative data analysis (QDA) software is used in many academic fields, such as sociology, psychology, political science, medicine, and educational science, and it is also a popular tool for businesses and market researchers.

Computer assisted qualitative data analysis software (CAQDAS), such as MAXQDA, serves to provide insights into qualitative data sets without suggesting interpretations. Based on a content analysis, the researcher can draw conclusions about the respective object of research (e.g. interview data). Software tools for qualitative data allow for easy sorting, structuring, and analyzing of large amounts of text or other data and facilitate the management of the resulting interpretations and evaluations.

## Qualitative Data Analysis Software (QDA Software)

Qualitative data analysis (QDA) relies on various methods for systematizing, organizing, and analyzing non-numeric data, such as those used in Grounded Theory, qualitative content analysis, mixed methods analysis, group discussions, discourse analysis, case and field studies. Whatever approach a researcher chooses, the computer assisted data analysis package should support and facilitate the process of sorting, structuring, and analyzing data material.

In addition to the traditional use of textual data, there is a trend toward the inclusion and analysis of image files, audio and video materials, and social media data. Sophisticated computer assisted data analysis software allows for importing and transcribing these recordings directly in the program. In addition, QDA software, such as MAXQDA, supports the entire analytic process by visualizing relationships and providing overviews. It also permits the addition of notes (so-called memos), which help other researchers understand the various analytical steps. By using

automatic processes to visualize data material, QDA software supports the researcher's steps towards gaining critical insight.

## Features and Roles of Computerized Data Analysis

### 1) Easy Result Formats

Results are imperative parts of big data analytics model as they support in the decision-making process, that are made to decide future strategy and goals. Scientists prefer the results to get the result in the real-time so that they can take better and appropriate decisions, based on the analysis result.

The tools must be able to produce a result in such a way that it can provide insights into data analysis and decision-making platform. The platform should be able to provide the real-time streams that can help in making instant and quick decisions.

### 2) Raw data Processing

Here, the data processing means collecting and organizing data in a meaningful manner. Data modeling takes complex data sets and displays them in the visual form or diagram or chart. Here, data should be interpretable and digestible so that it can be used in making decisions. Tools of big data analytics must be able to import data from various data sources such as Microsoft Access, text files, Microsoft Excel and other files. Tools must be able to collect data from multiple data sources and in multiple formats. In this way need for data conversion will be reduced and overall process speed will be improved. Even the export quality and capability to visualize data sets and handling various formats like PDFs, Excel, or Word files can be used directly to collect and transfer the data. Below-listed features are essential for the data processing tools:

- Data Mining
- Data Modeling
- File Exporting

- Data File Sources

**3) Prediction apps or Identity Management**

Identity management is also a required and essential feature for any data analytics tool. The tool should be able to access any system and all related information that may be related to the computer hardware, software or any other individual computer. Here, the identity management system is also related to managing all issues related to the identity, data protection, and access so that it can support system, network passwords, and protocols. Here, it should be clear that whether a user can access the system or not and to which level the system access permission is granted? Identity management applications and system ensure that only authenticated users can access the system information and the tool or system must be able to organize a security plan and include fraud analytics and real-time security.

**4) Reporting Feature**

Businesses remain on top with the help of reporting features. Even time-to-time data should be fetched and represented in a well-organized manner. These way decision-makers can take timely decisions and handle the critical situations as well, especially in a society that is moving rapidly. Data tools use dashboards to present KPIs and metrics. The reports must be customizable and target data set oriented. The expected capabilities of reporting tools are Real-time reporting, dashboard management, and location-based insights.

**5) Security Features**

For any successful business, it is essential to save their data. The tools that are used for big data analytics should offer safety and security to the data. For this there should be SSO feature that is known as a single sign-on feature with the help of that there is no need for the user to sign-in multiple times during the same session, even with the help of single or same login user can log in multiple times and monitor user activities and accounts. Moreover, data encryption is also an imperative feature that should be provided by Big Data analytics tools. It means to change the form of data or to make it unreadable from a readable form by using several algorithms and codes. Sometimes automatic encryption is also offered by web browsers. Comprehensive

encryption capabilities are also offered by data analytics tools. For this single sign-on and data encryption are two of the most used and popular features.

**6) Fraud management**

A variety of fraud detection functionalities remain involved in the fraud analytics. Mainly when it comes to the fraud detection activities then it involves various fraud analytics. Due to these activities, businesses mainly focus on the way with which they will deal with the fraud rather than preventing any fraud. Fraud detection can be performed by data analytics tools. The tools should be able to perform repeated tests on the data at any time just to ensure that there will be no amiss. In this way, threats can be identified quickly and efficiently. With effective fraud analytics and identity management capabilities.

**7) Technologies Support**

Your data analytics tool must support the latest tools and technologies, especially those that are important for your organization. Here, one most important one is the A/B testing that is also known as the bucket or split testing, in this testing two webpage versions are compared to determine the performance of a better page. Here both the versions are compared on the basis in which user interacts with the webpage and then the best one is considered. Moreover, as far as technical support is concerned then your tool must be able to integrate with Hadoop, that is a set of open-source programs that can work as the backbone of data-analytics activities. Hadoop mainly involves the following four modules with which integration is expected:

- **MapReduce**: It can read data from a file system that can be interpreted in the visualized manner.
- **Hadoop Common**: For this, Java tool collection may be required to read data stored in the user's file system.
- **YARN**: It is responsible to manage system resources so that data can be stored and analysis can be performed
- **Distributed File System**: It allows data to be stored in an easy format. If the results of tools will be integrated with these Hadoop modules then the user can easily send the results to the

user system. In this way flexibility, interoperability and both way communication can be ensured between organizations.

**8) Version Control**

Most of the data analytics tools are involved in adjusting data analytics model parameters. But it may cause problems when pushed into production. Version control feature of big analytics tools will surely improve the capabilities to track changes and it is able to release previous versions too whenever needed.

**9) Scalability**

Data will not the same all the times but it will grow as your organization is growing. With big data tools, this is always easy to scale-up as soon as new data is collected for the company and it can be analyzed well as expected. Also, the meaningful insights driven from data is pushed or integrated into the previous data successfully.

**10) Quick Integrations**

With integration capabilities, this is always easy to share data results with developers and data scientists. Big data tools always support the quick integration with cloud apps, data warehouses, other databases etc.

## What is SPSS?

SPSS stands for "Statistical Package for the Social Sciences". It is an IBM tool. This tool first launched in 1968. This is one software package. This package is mainly used for statistical analysis of the data.

SPSS is mainly used in the following areas like healthcare, marketing, and educational research, market researchers, health researchers, survey companies, education researchers, government, marketing organizations, data miners, and many others.

It provides data analysis for descriptive statistics, numeral outcome predictions, and identifying groups. This software also gives data transformation, graphing and direct marketing features to manage data smoothly.

## Features of SPSS

- The data from any survey collected via Survey Gizmo gets easily exported to SPSS for detailed and good analysis.
- In SPSS, data gets stored in.SAV format. These data mostly comes from surveys. This makes the process of manipulating, analyzing and pulling data very simple.
- SPSS have easy access to data with different variable types. These variable data is easy to understand. SPSS helps researchers to set up model easily because most of the process is automated.
- After getting data in the magic of SPSS starts. There is no end on what we can do on this data.
- SPSS has a unique way to get data from critical data also. Trend analysis, assumptions, and predictive models are some of the characteristics of SPSS.
- SPSS is easy for you to learn, use and apply.
- It helps in to get data management system and editing tools handy.
- SPSS offers you in-depth statistical capabilities for analyzing the exact outcome.
- SPSS helps us to design, plotting, reporting and presentation features for more clarity.

## Functions of SPSS

SPSS offers four programs that assist researchers with their complex data analysis needs.

**1. Statistics Program**

SPSS's Statistics program provides a plethora of basic statistical functions, some of which include frequencies, **cross tabulation**, and bivariate statistics.

**2. Modeler Program**

SPSS's Modeler program enables researchers to build and validate predictive models using advanced statistical procedures.

**3. Text Analytics for Surveys Program**

SPSS's Text Analytics for Surveys program helps survey administrators uncover powerful insights from responses to open ended survey questions.

**4. Visualization Designer**

SPSS's Visualization Designer program allows researchers to use their data to create a wide variety of visuals like density charts and radial box plots with ease.

In addition to the four programs mentioned above, SPSS also provides solutions for data management, which allow researchers to perform case selection, create derived data, and perform file reshaping.

SPSS also offers the feature solution of data documentation, which allows researchers to store a metadata dictionary. This metadata dictionary acts as a centralized repository of information pertaining to data such as meaning, relationships to other data, origin, usage, and format.

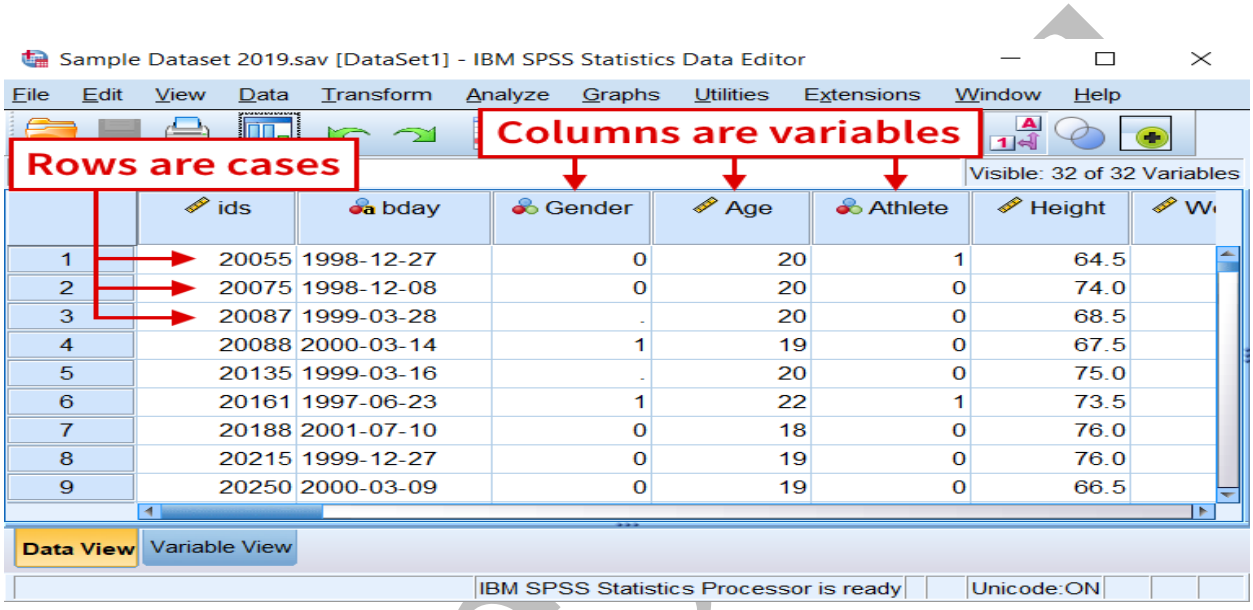
## Reading the Data View Window

When you view data in SPSS, each row in the Data View represents a case, and each column represents a variable.

Cases represent independent observations, experimental units, or subjects. For example, if the data are based on a survey of college students, then each row in the data would represent a specific college student who participated in the study.

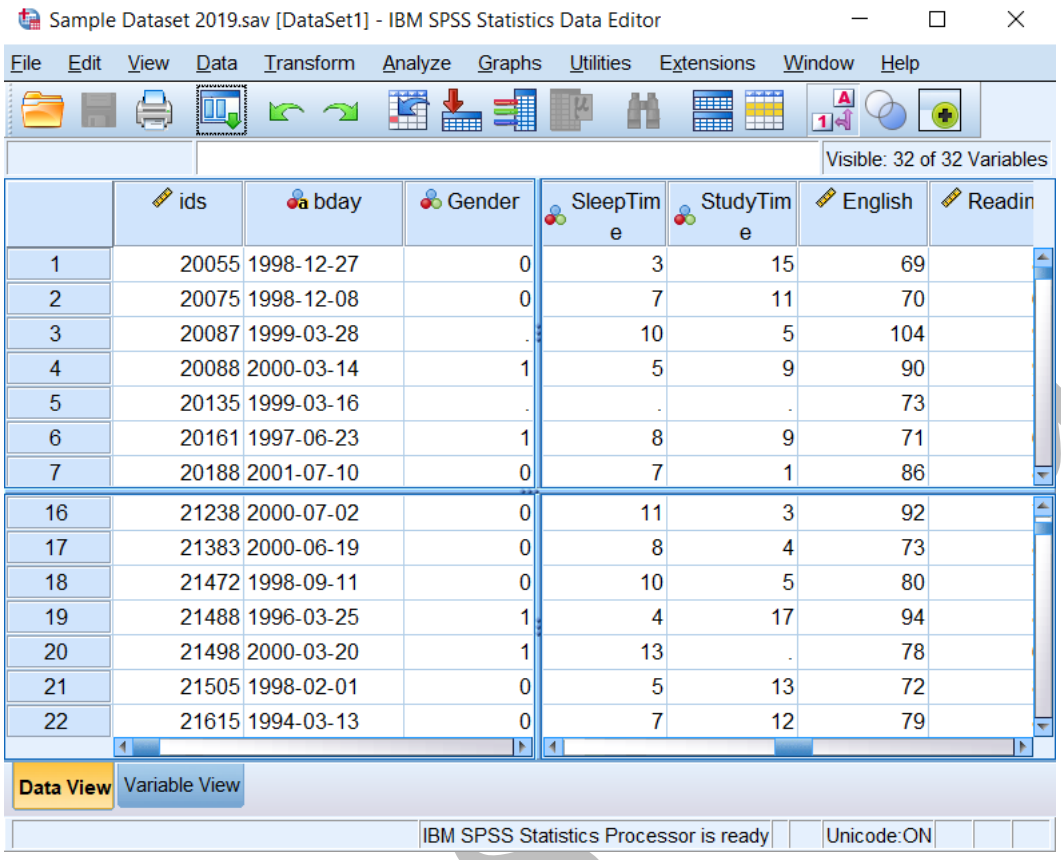
Variables are attributes, characteristics, or measurements that describe cases. For example, your data might include information such as each college student's date of birth, gender, or class rank. Each of these pieces of information is a variable that describes each case (college student).

This is a typical layout for data, where rows are cases and columns are variables. (Other data structures are possible.)




## Viewing Multiple Sections of Data Simultaneously

Sometimes it is useful to be able to see multiple sections of your data in the Data Editor window at the same time. The Split option allows you to divide the Data View window into multiple sections that can be viewed simultaneously. This option is especially helpful if you need to simultaneously view multiple sections of your data that are far apart in the spreadsheet. To split the window, click **Window > Split**.




Now the Data Editor window is partitioned into four sections. The upper and lower sections, as well as the left and right sections, are controlled by separate scroll bars.

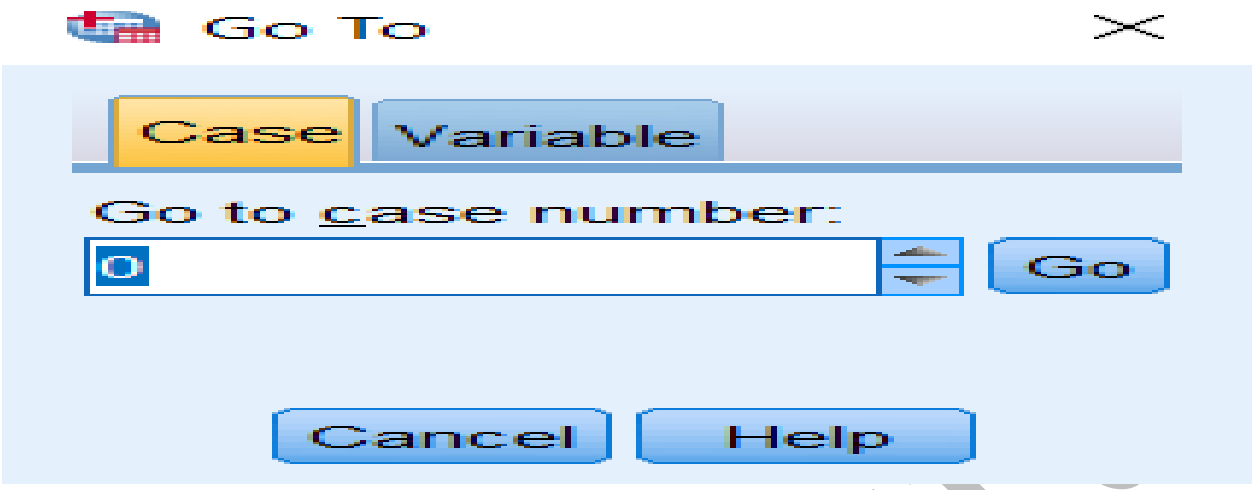
## Looking Up a Specific Case

SPSS provides a way of quickly jumping to specific cases or variables in your dataset in the Data View window. This is an especially useful option for large datasets that include hundreds of cases and variables.

To jump to a specific case number:

1. Click the **Go to case** icon  or click **Edit > Go to Case**.

2. In the **Go to case number** list**,** enter the case number or use the up/down arrows on the right to select the case number.



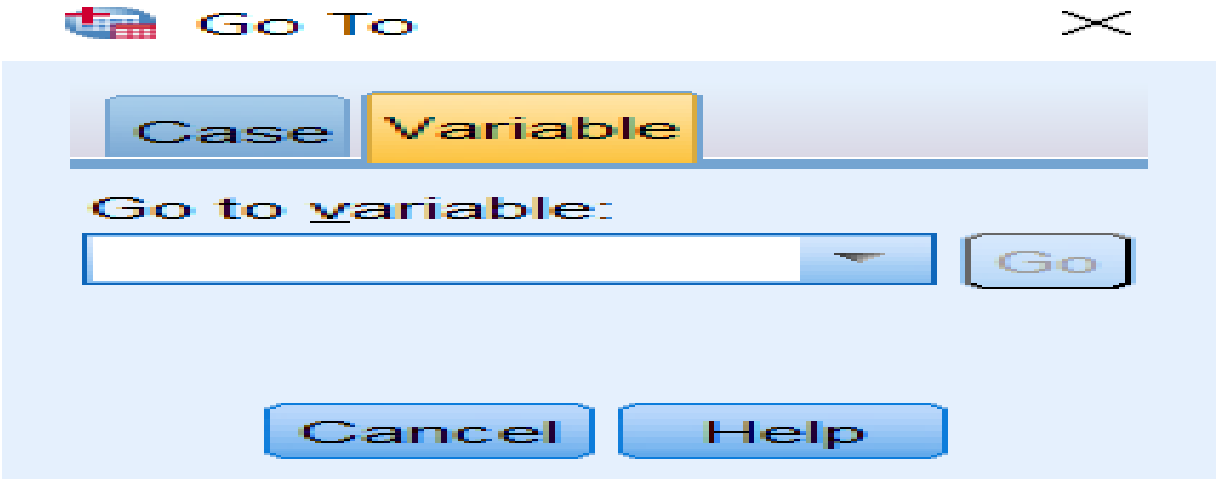

3. Click **Go**. SPSS will jump to the case number specified.

## Looking Up a Specific Variable

To jump to a specific variable:

1. Click the **Go to variable** icon  or click **Edit > Go to Variable**.

2. In the **Go to variable** list, type the variable name or select the variable name from the drop-down menu.




3. Click **Go**. SPSS will jump to the variable name you selected.