

Multivariate Analysis using SPSS

Using SPSS Syntax

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Data Analysis

Data Analysis (in SPSS)

Measurement Levels

Data Types

Numerical Simulations

Data Coding

Who am I?

Academic details

URL - <http://gsib.gitam.edu/FacultyResearch/m-kamakshaiah>

Community

google groups -

<https://groups.google.com/forum/#!forum/the-social-research-insights>

Portal - <http://sri-india.in/>

Personal Blogs

Third-party Website - <http://kamakshaiah.weebly.com/>

Blog - <http://kamakshaiah.blogspot.com/>

Lecture Demos

YouTube Channel - https://www.youtube.com/channel/UC_lrq5p2VNUtmgF2aynKIMA



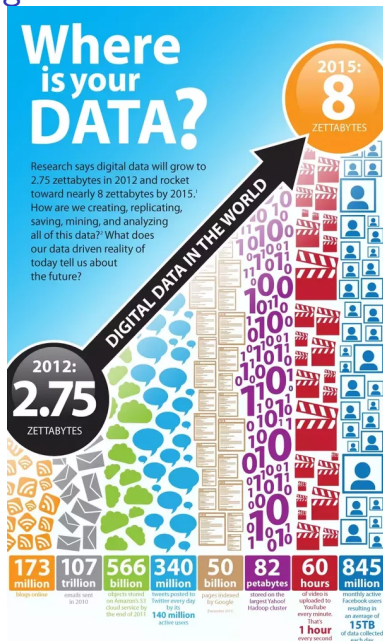
"Well, no, I don't see any patterns in this data,
but I did see Elvis in my oatmeal this morning!"

Data Analysis

Data analysis is a process of inspecting, cleansing, transforming, and modeling data with the goal of discovering useful information which helps decision making. ¹

¹Retrieved from https://en.wikipedia.org/wiki/Data_analysis ▶

The overwhelming size of data!



The day start with data! ²

1. Global internet population grew from 16 % (2005) to 47% of population (3.43 billion)
2. What happens in every minute?
 - ▶ YouTube accepts 72 Hrs of new video.
 - ▶ Gmail handles 204 emails
 - ▶ Google processes 4 million searches online
 - ▶ Facebook handles 2.4 million pieces of content
 - ▶ Amazon makes \$ 83,000/- worth sales

²Gunelius, S., (Jul 12, 2014). The Data Explosion in 2014 Minute by Minute - Infographic. Retrieved from <https://aci.info>

Little bit about SPSS



- ▶ Statistical Package for the Social Sciences (SPSS) is first developed by Norman H. Nie in 1968 with his friends.
- ▶ SPSS Statistics are accessible via pull-down menus.
- ▶ Can be programmed with a proprietary 4GL command syntax language.
 - ▶ reproducible output,
 - ▶ simplifying repetitive tasks,
 - ▶ and handling complex data manipulations and analyses.
- ▶ Can handle various input file formats & external data bases.
- ▶ Has extensions for GNU/R and Python.

Data analysis in SPSS

Steps:

1. Importing
2. Code and Recode
3. Value & labels
4. Analysis
5. Reporting

Measurement Level

- ▶ Nominal - name sake data
- ▶ Ordinal - posses order
- ▶ Interval - has classes
- ▶ Ratio - decimal point (floats) has value



Figure: Horse Race Analogy

Nominal



Figure: Horse Race Analogy



Figure: Horse Race Analogy

Ordinal



Figure: Horse Race Analogy

Interval



Figure: Horse Race Analogy

Ratio

What is the average speed of class two horses in the race?

Ratio

What is the average speed of class two horses in the race?

$$\textit{speed} = \frac{\textit{distance}}{\textit{time}}$$

Ratio



Figure: Horse Race Analogy

Data types

1. Numerical vs. Non-numerical (vector vs. factor)

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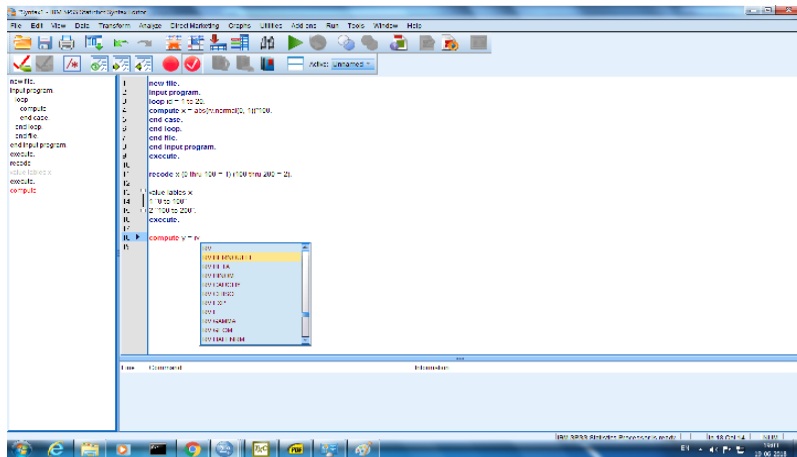
Data types

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Probability Distributions

1. Bernoulli
2. Beta
3. Binom
4. Cauchy
5. ... etc.

Syntax Window



Syntax Window

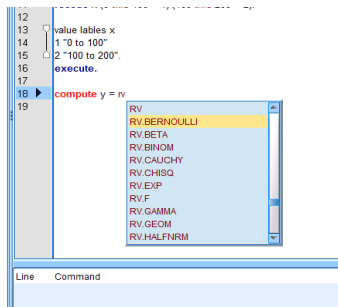


Figure: Probability Distributions

Numerical Simulations in SPSS

Simulating data in SPSS is rather more easier compared to Excel.

1. For continuous data use RV.NORMAL()
2. For discrete data use RV.UNIFORM()

Numerical Simulations in SPSS - Vector

```
new file.  
input program.  
loop id = 1 to 20.  
compute x = abs(rv.normal(0, 1))*100.  
end case.  
end loop.  
end file.  
end input program.  
execute.
```

Numerical Simulations in SPSS - Factor

```
new file.  
input program.  
loop id = 1 to 20.  
compute gender = trunc(rv.uniform(1, 3)).  
end case.  
end loop.  
end file.  
end input program.  
execute.
```

Recoding Data

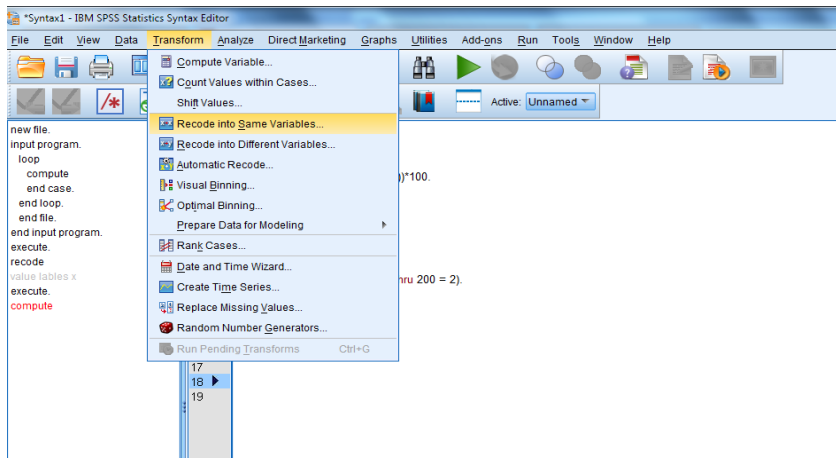


Figure: Data Coding

Recoding using Syntax

```
recode income (0 thru 100 = 1) (100 thru 200 = 2).
```

```
value labels income
```

```
1 "0 to 100"
```

```
2 "100 to 200".
```

```
value labels gender
```

```
1 "male"
```

```
2 "female".
```

```
execute.
```



Now you are ready for ANALYSIS!