



Data Management & Visualization

Kuliah 3 STA1381 – Pengantar Sains Data

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A complex fractal pattern, resembling a Mandelbrot set, fills the right side of the slide. It features intricate, swirling, and branching structures in shades of light blue, white, and pale purple, set against a darker blue background.

Outline

- Manajemen data
- Visualisasi data

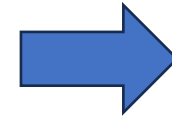
Manajemen Data

Manajemen Data

- Pada data web scraping yang sudah diperoleh, akan dilakukan proses manajemen data
- Manajemen data dimaksudkan untuk:
 - Menyesuaikan format peubah (numerik, teks)
 - Menyusun peubah-peubah tertentu

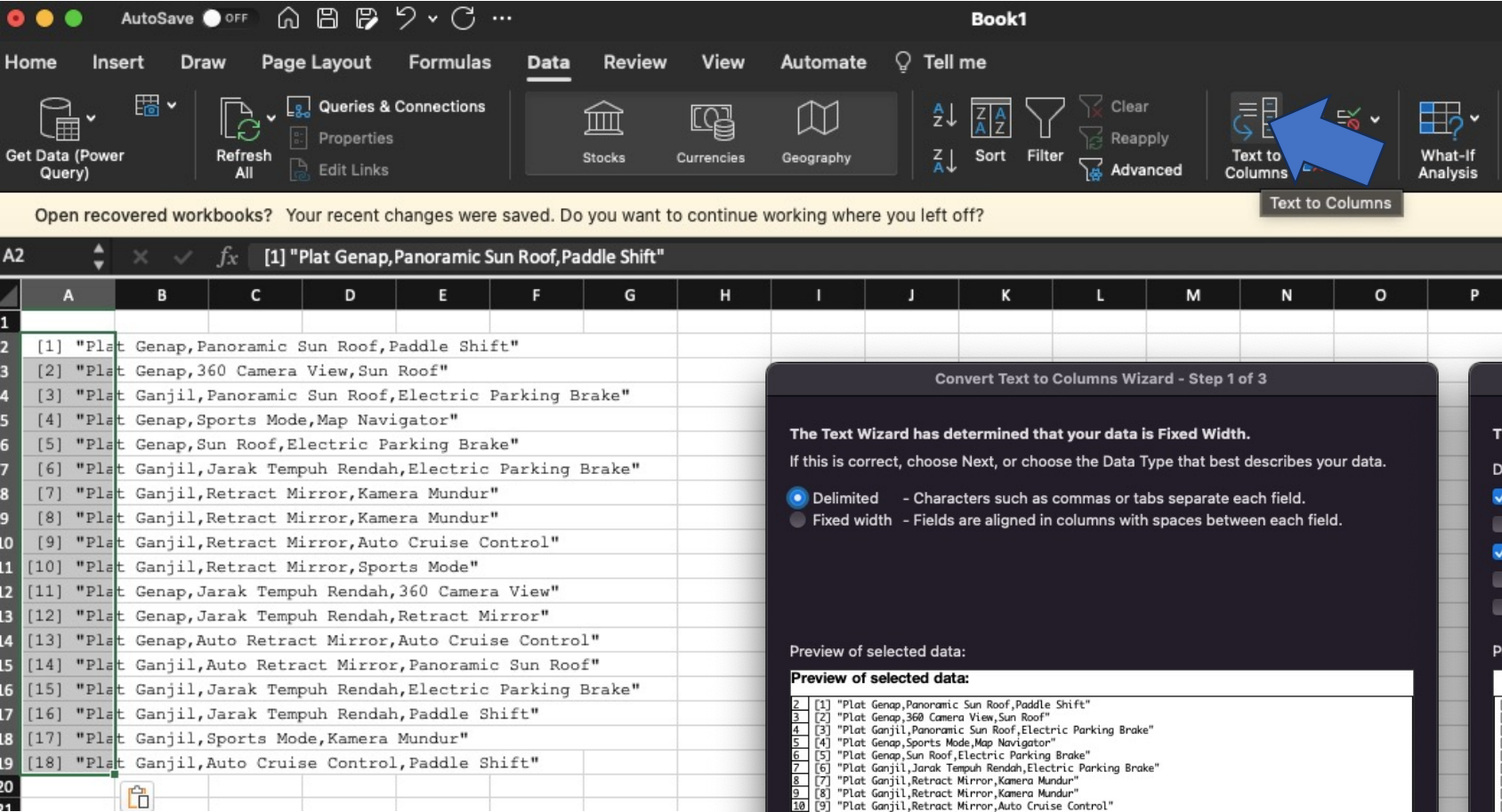
1. Perhatikan data hasil web scraping Data Mobil Bekas

```
[1] "Plat Genap,Panoramic Sun Roof,Paddle Shift"
[2] "Plat Genap,360 Camera View,Sun Roof"
[3] "Plat Ganjil,Panoramic Sun Roof,Electric Parking Brake"
[4] "Plat Genap,Sports Mode,Map Navigator"
[5] "Plat Genap,Sun Roof,Electric Parking Brake"
[6] "Plat Ganjil,Jarak Tempuh Rendah,Electric Parking Brake"
[7] "Plat Ganjil,Retract Mirror,Kamera Mundur"
[8] "Plat Ganjil,Retract Mirror,Kamera Mundur"
[9] "Plat Ganjil,Retract Mirror,Auto Cruise Control"
[10] "Plat Ganjil,Retract Mirror,Sports Mode"
[11] "Plat Genap,Jarak Tempuh Rendah,360 Camera View"
[12] "Plat Genap,Jarak Tempuh Rendah,Retract Mirror"
[13] "Plat Genap,Auto Retract Mirror,Auto Cruise Control"
[14] "Plat Ganjil,Auto Retract Mirror,Panoramic Sun Roof"
[15] "Plat Ganjil,Jarak Tempuh Rendah,Electric Parking Brake"
[16] "Plat Ganjil,Jarak Tempuh Rendah,Paddle Shift"
[17] "Plat Ganjil,Sports Mode,Kamera Mundur"
[18] "Plat Ganjil,Auto Cruise Control,Paddle Shift"
```

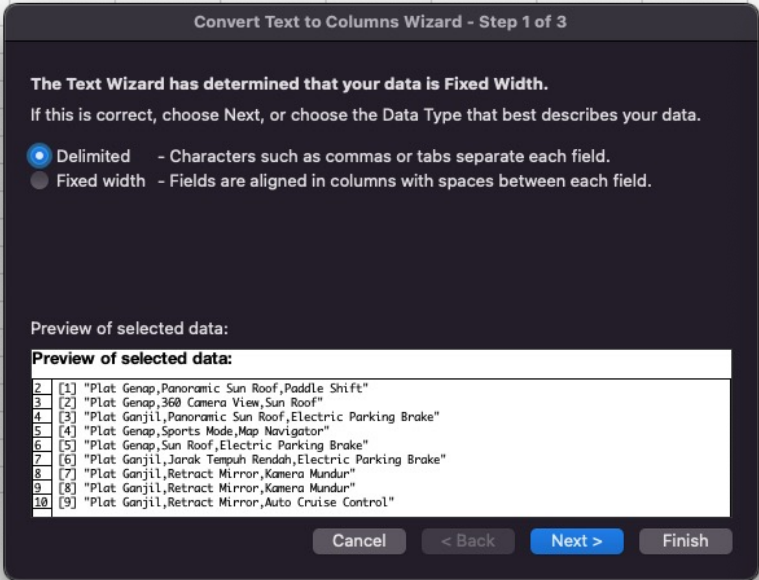


Dapat diekstrak
menjadi 3 peubah

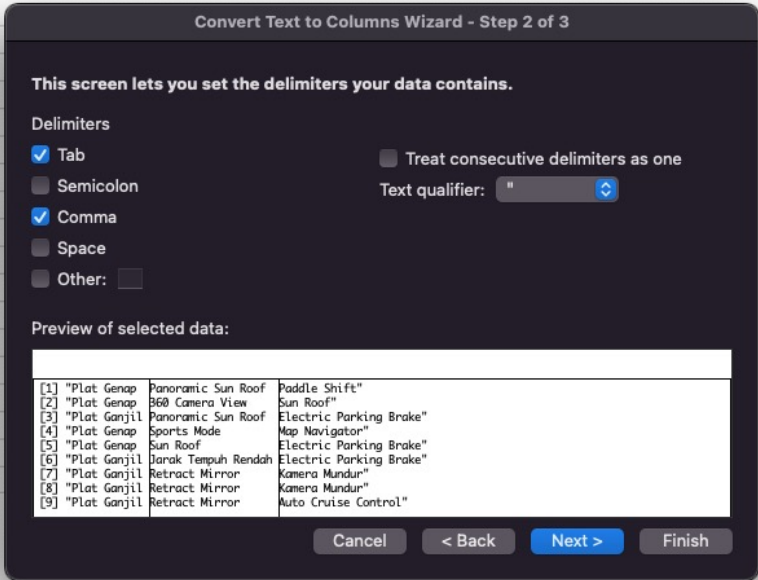
Ekstraksi peubah → dengan Ms. Excel



Menu **Data** → Text to Columns

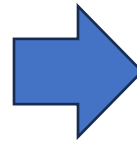


Pilih **Delimited**, Next >



Pilih **Delimiters** yang sesuai (dalam hal ini "Comma"), Next >

[1] "Plat Genap,Panoramic Sun Roof,Paddle Shift"
 [2] "Plat Genap,360 Camera View,Sun Roof"
 [3] "Plat Ganjil,Panoramic Sun Roof,Electric Parking Brake"
 [4] "Plat Genap,Sports Mode,Map Navigator"
 [5] "Plat Genap,Sun Roof,Electric Parking Brake"
 [6] "Plat Ganjil,Jarak Tempuh Rendah,Electric Parking Brake"
 [7] "Plat Ganjil,Retract Mirror,Kamera Mundur"
 [8] "Plat Ganjil,Retract Mirror,Kamera Mundur"
 [9] "Plat Ganjil,Retract Mirror,Auto Cruise Control"
 [10] "Plat Ganjil,Retract Mirror,Sports Mode"
 [11] "Plat Genap,Jarak Tempuh Rendah,360 Camera View"
 [12] "Plat Genap,Jarak Tempuh Rendah,Retract Mirror"
 [13] "Plat Genap,Auto Retract Mirror,Auto Cruise Control"
 [14] "Plat Ganjil,Auto Retract Mirror,Panoramic Sun Roof"
 [15] "Plat Ganjil,Jarak Tempuh Rendah,Electric Parking Brake"
 [16] "Plat Ganjil,Jarak Tempuh Rendah,Paddle Shift"
 [17] "Plat Ganjil,Sports Mode,Kamera Mundur"
 [18] "Plat Ganjil,Auto Cruise Control,Paddle Shift"



Plat Genap	Panoramic Sun Roof	Paddle Shift
Plat Genap	360 Camera View	Sun Roof
Plat Ganjil	Panoramic Sun Roof	Electric Parking Brake
Plat Genap	Sports Mode	Map Navigator
Plat Genap	Sun Roof	Electric Parking Brake
Plat Ganjil	Jarak Tempuh Rendah	Electric Parking Brake
Plat Ganjil	Retract Mirror	Kamera Mundur
Plat Ganjil	Retract Mirror	Kamera Mundur
Plat Ganjil	Retract Mirror	Auto Cruise Control
Plat Ganjil	Retract Mirror	Sports Mode
Plat Genap	Jarak Tempuh Rendah	360 Camera View
Plat Genap	Jarak Tempuh Rendah	Retract Mirror
Plat Genap	Auto Retract Mirror	Auto Cruise Control
Plat Ganjil	Auto Retract Mirror	Panoramic Sun Roof
Plat Ganjil	Jarak Tempuh Rendah	Electric Parking Brake
Plat Ganjil	Jarak Tempuh Rendah	Paddle Shift
Plat Ganjil	Sports Mode	Kamera Mundur
Plat Ganjil	Auto Cruise Control	Paddle Shift

Bagaimana caranya?

2. Perhatikan data hasil web scraping Data Handphone Android

web-scraper-order	web-scraper-start-url	nama_hp	harga_hp		
1692063197-1	https://www.blibli.com/cari/handphone%20android	Xiaomi Redmi 9C Smartphone [4GB/ 64GB]	Rp1.589.000		
1692063197-2	https://www.blibli.com/cari/handphone%20android	Asus Zenfone 3 ZE520KL Smartphone [32GB/ 4GB]	Rp1.299.000		
1692063197-3	https://www.blibli.com/cari/handphone%20android	Xiaomi Poco M3 Pro 5G Smartphone [4GB/64GB]	Rp2.250.000		
1692063197-4	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy S21 FE 8/256GB RAM 8 ROM 256 Handphone Hp Smartphone Android Garansi Resmi	Rp7.099.000		
1692063197-5	https://www.blibli.com/cari/handphone%20android	Vivo Y15S 3/64 GB RAM 3 ROM 64GB Handphone Hp Smartphone Android Original Murah Garansi Resmi	Rp1.480.000		
1692063197-6	https://www.blibli.com/cari/handphone%20android	OPPO A31 Handphone Android - Black [4/128]	Rp2.547.902		
1692063197-7	https://www.blibli.com/cari/handphone%20android	Advan NasaPlus 2GB 16GB Smartphone Android10 Garansi Resmi	Rp845.000		
1692063197-8	https://www.blibli.com/cari/handphone%20android	OPPO A57 4/64 GB Smartphone Android Original Garansi Resmi	Mulai		Rp2.399.000
1692063197-9	https://www.blibli.com/cari/handphone%20android	Advan NasaPlus 2GB 16GB Smartphone Android10 Garansi Resmi Deep Blue	Rp845.000		
1692063197-10	https://www.blibli.com/cari/handphone%20android	Hp xiami not 9	Rp2.100.000		
1692063197-11	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A04e 3/32 GB RAM 3GB 32GB Smartphone Android	Rp1.137.000		
1692063197-12	https://www.blibli.com/cari/handphone%20android	Infinix Hot 30i 8/128 RAM 8GB ROM 128GB 8 128 GB HP Android	Rp1.475.000		
1692063197-13	https://www.blibli.com/cari/handphone%20android	POCO C40 3/32 GB - Resmi	Rp1.258.000		
1692063197-14	https://www.blibli.com/cari/handphone%20android	Handphone OPPO A37	Rp700.000		
1692063197-15	https://www.blibli.com/cari/handphone%20android	XIAOMI REDMI 10A RAM 3GB - 64GB GARANSI RESMI	Mulai		Rp1.149.000
1692063197-16	https://www.blibli.com/cari/handphone%20android	Xiaomi MI 11T Pro 12/256 GB RAM 12 ROM 256GB Handphone Smartphone Android Original Garansi Resmi	Rp7.899.000		
1692063197-17	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A13 4/128 6/128 4GB 6GB 128GB RAM 4 6 ROM 128 GB HP Smartphone Android	Mulai		Rp2.500.000
1692063197-18	https://www.blibli.com/cari/handphone%20android	handphone samsung A12 6/128 resmi sein	Rp2.750.000		
1692063197-19	https://www.blibli.com/cari/handphone%20android	Advan Nasa Pro 2 GB 32 GB Smartphone Android 11	Rp799.000		
1692063197-20	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A73 5G 8/256 8GB 256GB RAM 8 ROM 256 GB Smartphone Android	Rp8.518.000		
1692063197-21	https://www.blibli.com/cari/handphone%20android	ALDO A9 SMARTPHONE RAM 3GB INTERNAL 16GB ANDROID	Rp680.000		
1692063197-22	https://www.blibli.com/cari/handphone%20android	HP Oppo A53S murah terbaru 2022 OPPO A53 5 5G RAM 8 + 256 GB Original New Baru Smartphone Android 6.52in HP OPPO Murah garansi 1 tahun	Rp2.459.000		
1692063197-23	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy S21 FE 8/256 GB RAM 8 ROM 256 Handphone Hp Smartphone Android Garansi Resmi	Rp7.149.000		
1692063197-24	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A04e Smartphone [3/32GB]	Rp1.500.000		
1692063197-25	https://www.blibli.com/cari/handphone%20android	Samsung A14 4/128	Rp2.399.000		
1692063197-26	https://www.blibli.com/cari/handphone%20android	Oppo Reno 8T 5G 8/256GB	Rp6.199.000		
1692063197-27	https://www.blibli.com/cari/handphone%20android	OPPO A96 8GB/256GB Garansi Resmi 1 Tahun	Rp3.231.000		
1692063197-28	https://www.blibli.com/cari/handphone%20android	Vivo V25E 8/128 Garansi resmi vivo	Rp3.699.000		
1692063197-29	https://www.blibli.com/cari/handphone%20android	Huawei Y6 II LTE Smartphone - Black [16GB/ 2GB]	Rp3.849.000		
1692063197-30	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A54 8/128GB	Rp5.599.000		
1692063197-31	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A54 8/256GB	Rp5.999.000		
1692063197-32	https://www.blibli.com/cari/handphone%20android	SAMSUNG A03 CORE 2/32 GB [GARANSI RESMI]	Rp1.199.000		
1692063197-33	https://www.blibli.com/cari/handphone%20android	Xiaomi Redmi 9C Smartphone [4GB/ 64GB]	Rp1.625.000		
1692063197-34	https://www.blibli.com/cari/handphone%20android	Vivo Y16 - 3GB/32GB	Rp1.799.000		
1692063197-35	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A04e Smartphone [4/64GB]	Mulai		Rp1.799.000
1692063197-36	https://www.blibli.com/cari/handphone%20android	Tecno Pova Neo 5G Smartphone [12GB/512GB]	Rp2.269.000		
1692063197-37	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A23 5G 8/128GB	Rp2.487.500		
1692063197-38	https://www.blibli.com/cari/handphone%20android	Samsung Galaxy A23 5G 8/128GB	Mulai		Rp3.799.000
1692063197-39	https://www.blibli.com/cari/handphone%20android	Xiaomi Redmi 9A Smartphone [32 GB/ 2 GB]	Rp1.110.000		
1692063197-40	https://www.blibli.com/cari/handphone%20android	Vivo Y16 Smartphone [4GB/128GB]	Rp1.899.000		
1692063197-41	https://www.blibli.com/cari/handphone%20android	REALME C31 RAM 3/32 GB GARANSI RESMI	Rp1.470.000		
1692063197-42	https://www.blibli.com/cari/handphone%20android	Redmi 9A 2/32GB	Rp1.500.500		
1692063197-43	https://www.blibli.com/cari/handphone%20android	Infinix Note 7 Lite Smartphone [4GB- 64GB]	Rp1.470.000		
1692063197-44	https://www.blibli.com/cari/handphone%20android	Xiaomi redmi 9T RAM 4/64 GB garansi resmi	Rp1.470.000		
1692063197-45	https://www.blibli.com/cari/handphone%20android	Samsung M23 5G 6/128 garansi resmi	Rp1.470.000		

Dapat di ekstrak menjadi beberapa peubah

Belum numerik

Penyesuaian peubah harga untuk menjadi peubah numerik

harga_hp		
Rp1.589.000		
Rp1.299.000		
Rp2.250.000		
Rp7.099.000		
Rp1.480.000		
Rp2.547.902		
Rp845.000		
Mulai		Rp2.399.000
Rp845.000		
Rp2.100.000		
Rp1.137.000		
Rp1.475.000		
Rp1.258.000		
Rp700.000		
Mulai		Rp1.149.000
Rp7.899.000		
Mulai		Rp2.500.000
Rp2.750.000		
Rp799.000		
Rp8.518.000		
Rp680.000		
Rp2.459.000		
Rp7.149.000		
Rp1.500.000		
Rp2.399.000		
Rp6.199.000		
Rp3.231.000		
Rp3.699.000		
Rp3.849.000		
Rp5.599.000		
Rp5.999.000		
Rp1.199.000		
Rp1.625.000		
Rp1.799.000		
Mulai		Rp1.799.000
Rp2.269.000		
Rp2.487.500		
Mulai		Rp3.799.000
Rp1.110.000		
Rp1.899.000		
Rp1.470.000		
Rp1.500.500		
Rp2.100.000		
Rp2.475.000		
Rp3.309.800		

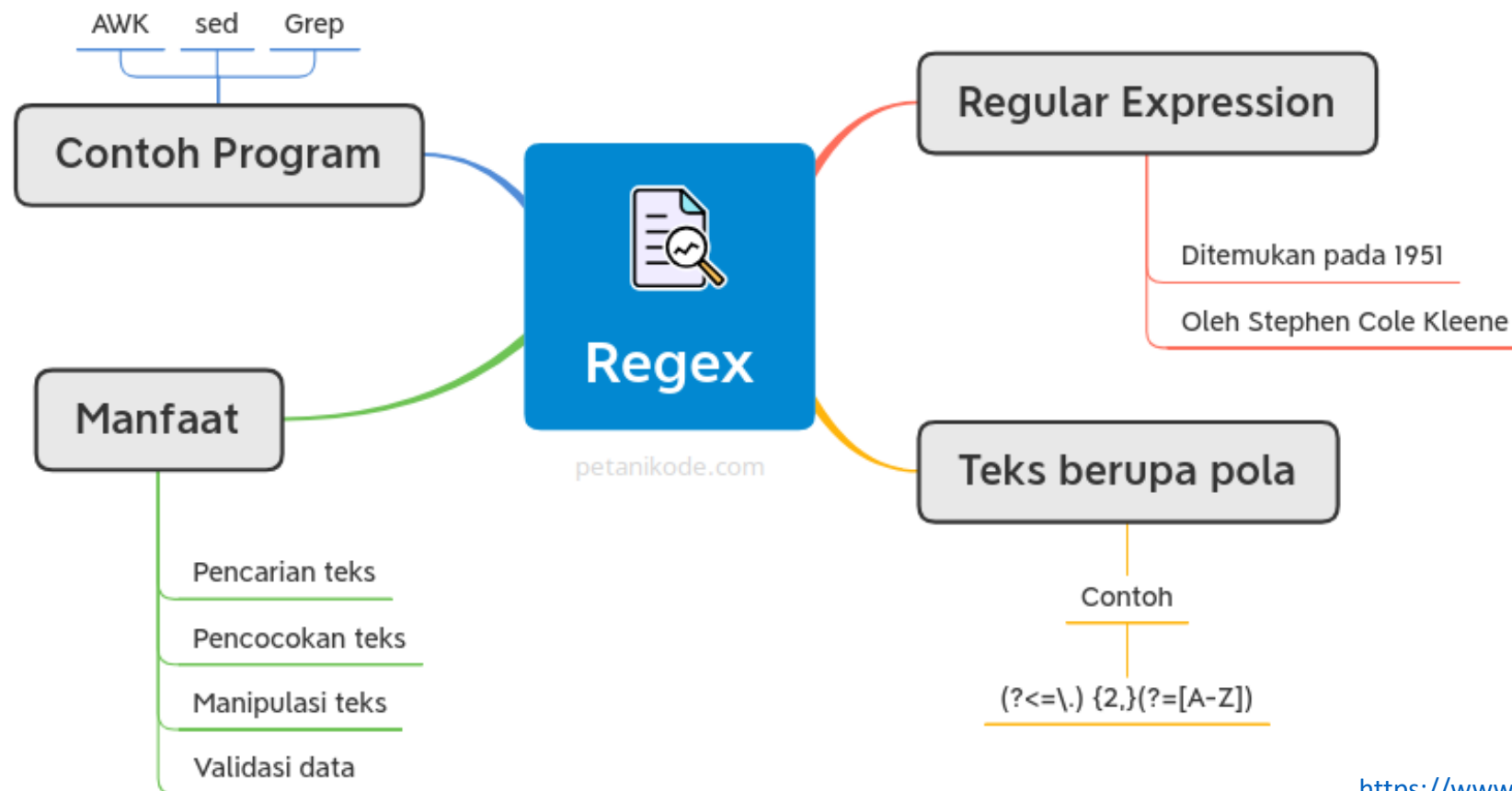


Numerik???

Gunakan Regular Expression (Regex)

Regular Expression (Regex)

→ Susunan string yang mendefinisikan pola pencarian sehingga dapat membantu kita untuk melakukan matching (pencocokan), locate (pencarian), dan manipulasi teks.





Beberapa simbol yang sering digunakan:

<code>()</code>	→ untuk grouping;
<code> </code>	→ simbol untuk logika or (atau alternatif);
<code>[a-z]</code>	→ untuk mencari karakter dari huruf a sampai z;
<code>[A-Z]</code>	→ untuk mencari karakter dari huruf A sampai Z;
<code>[0-9]</code>	→ Untuk mencari angka 0 sampai 9;
<code>\w</code>	→ untuk mencari kata;
<code>\d</code>	→ untuk mencari angka;



Dapat diterapkan di R

Regular Expression (RegEx) di R

- R mendukung regular expression
- Dapat pula menggunakan package tambahan, seperti **stringr** (recommended), **stringi**, dll
- Beberapa fungsi di antaranya:

Fungsi	stringr	R Base
Mengembalikan semua element string yang cocok	<code>str_subset()</code>	<code>grep()</code>
Memeriksa keberadaan pola dalam string	<code>str_detect()</code>	<code>grepl()</code>
Ekstraksi pola yang cocok dari suatu string	<code>str_extract()</code> , <code>str_extract_all()</code>	<code>regexpr()</code> , <code>regmatches()</code> , <code>grep()</code>
Menemukan posisi dari pola dalam suatu string	<code>str_locate()</code>	<code>regexpr()</code>
Menemukan semua posisi dari pola dalam suatu string	<code>str_locate_all()</code>	<code>gregexpr()</code>
Mengganti pola yang cocok dari suatu string	<code>str_replace()</code>	<code>sub()</code>
Mengganti semua yang cocok dg pola dari suatu string	<code>str_replace_all()</code>	<code>gsub()</code>

<https://stringr.tidyverse.org/articles/from-base.html>

Ilustrasi di R

```
##ilustrasi regex
library(stringr)
perusahaan <- c("Roti Bangsawan", "08128712", "RB@email.id",
                "roti_bang29@gmail.com", "F3823KSB")
str_subset(perusahaan, 'a')
str_detect(perusahaan, '[0-9]')
str_extract_all(perusahaan, '[0-9]')
str_extract_all(perusahaan, '[0-9]+')
str_extract(perusahaan, '[a-z]+')
str_extract_all(perusahaan, '[a-z]+')
str_extract_all(perusahaan, '[A-Za-z]+')
str_replace(perusahaan, 'com|id', 'net')
str_replace_all(perusahaan, '[^a-z0-9]', '#')
str_remove_all(perusahaan, '[._@]+')
```

```
> str_subset(perusahaan, 'a')
[1] "Roti Bangsawan"      "RB@email.id"
[3] "roti_bang29@gmail.com"
> str_detect(perusahaan, '[0-9]')
[1] FALSE TRUE FALSE TRUE TRUE
> str_extract_all(perusahaan, '[0-9]')
[[1]]
character(0)

[[2]]
[1] "0" "8" "1" "2" "8" "7" "1" "2"

[[3]]
character(0)

[[4]]
[1] "2" "9"

[[5]]
[1] "3" "8" "2" "3"
```

```
> str_extract_all(perusahaan, '[0-9]+')
[[1]]
character(0)

[[2]]
[1] "08128712"

[[3]]
character(0)

[[4]]
[1] "29"

[[5]]
[1] "3823"

> str_extract(perusahaan, '[a-z]+')
[1] "oti"    NA      "email" "roti"  NA
```

```
> str_extract_all(perusahaan, '[a-z]+')
[[1]]
[1] "oti"      "angsawan"
```

```
[[2]]
character(0)
```

```
[[3]]
[1] "email" "id"
```

```
[[4]]
[1] "roti"  "bang"  "gmail" "com"
```

```
[[5]]
character(0)
```

```
> str_extract_all(perusahaan, '[A-Za-z]+')
[[1]]
[1] "Roti"      "Bangsawan"
```

```
[[2]]
character(0)
```

```
[[3]]
[1] "RB"      "email" "id"
```

```
[[4]]
[1] "roti"  "bang"  "gmail" "com"
```

```
[[5]]
[1] "F"      "KSB"
```

```
> str_replace(perusahaan, 'com|id', 'net')
[1] "Roti Bangsawan"      "08128712"
[3] "RB@email.net"        "roti_bang29@gmail.net"
[5] "F3823KSB"
```

```
> str_replace_all(perusahaan, '[^a-z0-9]', '#')
[1] "#oti##angsawan"      "08128712"
[3] "###email#id"         "roti#bang29#gmail#com"
[5] "#3823###"
```

```
> str_remove_all(perusahaan, '[._@]+')
[1] "Roti Bangsawan"      "08128712"
"RBemailid"
[4] "rotibang29gmailcom" "F3823KSB"
```


Kembali ke data

Penyesuaian peubah harga untuk menjadi peubah numerik

harga_hp		
Rp1.589.000		
Rp1.299.000		
Rp2.250.000		
Rp7.099.000		
Rp1.480.000		
Rp2.547.902		
Rp845.000		
Mulai		Rp2.399.000
Rp845.000		
Rp2.100.000		
Rp1.137.000		
Rp1.475.000		
Rp1.258.000		
Rp700.000		
Mulai		Rp1.149.000
Rp7.899.000		
Mulai		Rp2.500.000
Rp2.750.000		
Rp799.000		
Rp8.518.000		
Rp680.000		
Rp2.459.000		
Rp7.149.000		
Rp1.500.000		
Rp2.399.000		
Rp6.199.000		
Rp3.231.000		
Rp3.699.000		
Rp3.849.000		
Rp5.599.000		
Rp5.999.000		
Rp1.199.000		
Rp1.625.000		
Rp1.799.000		
Mulai		Rp1.799.000
Rp2.269.000		
Rp2.487.500		
Mulai		Rp3.799.000
Rp1.110.000		
Rp1.899.000		
Rp1.470.000		
Rp1.500.500		
Rp2.100.000		
Rp2.475.000		
Rp3.309.800		



Numerik???

```
#data
data.hp <- read.csv("/Users/gad/Documents/SRO/Pengantar
Sains Data/Ganjil 23 24/hpand.csv",
                    header=T, sep=";")

str(data.hp)

harga.hp <- data.hp$harga_hp
length(harga.hp)

library(stringr)
#remove dot
h1 <- str_remove_all(harga.hp, "[.]")
#ekstrak angka
h2 <- str_extract_all(h1, "[0-9]+")
#dibuat format numerik
h3 <- as.numeric(h2) #sudah ok
```

Ekstraksi peubah

nama_hp
Xiaomi Redmi 9C Smartphone [4GB/ 64GB]
Asus Zenfone 3 ZE520KL Smartphone [32GB/ 4GB]
Xiaomi Poco M3 Pro 5G Smartphone [4GB/64GB]
Samsung Galaxy S21 FE 8/256GB RAM 8 ROM 256 Handphone Hp Smartphone Android Garansi Resmi
Vivo Y15S 3/64 GB RAM 3 ROM 64GB Handphone Hp Smartphone Android Original Murah Garansi Resmi
OPPO A31 Handphone Android - Black [4/128]
Advan NasaPlus 2GB 16GB Smartphone Android10 Garansi Resmi
OPPO A57 4/64 GB Smartphone Android Original Garansi Resmi
Advan NasaPlus 2GB 16GB Smartphone Android10 Garansi Resmi Deep Blue
Hp xiom i not 9
Samsung Galaxy A04e 3/32 GB RAM 3GB 32GB Smartphone Android
Infinix Hot 30i 8/128 RAM 8GB ROM 128GB 8 128 GB HP Android
POCO C40 3/32 GB - Resmi
Handphone OPPO A37
XIAOMI REDMI 10A RAM 3GB - 64GB GARANSI RESMI
Xiaomi MI 11T Pro 12/256 GB RAM 12 ROM 256GB Handphone Smartphone Android Original Garansi Resmi
Samsung Galaxy A13 4/128 6/128 4GB 6GB 128GB RAM 4 6 ROM 128 GB HP Smartphone Android
handphone samsung A12 6/128 resmi sein

Memori Internal

RAM

Nama merek HP

Bagaimana Caranya ???

Ekstraksi peubah Nama merek HP

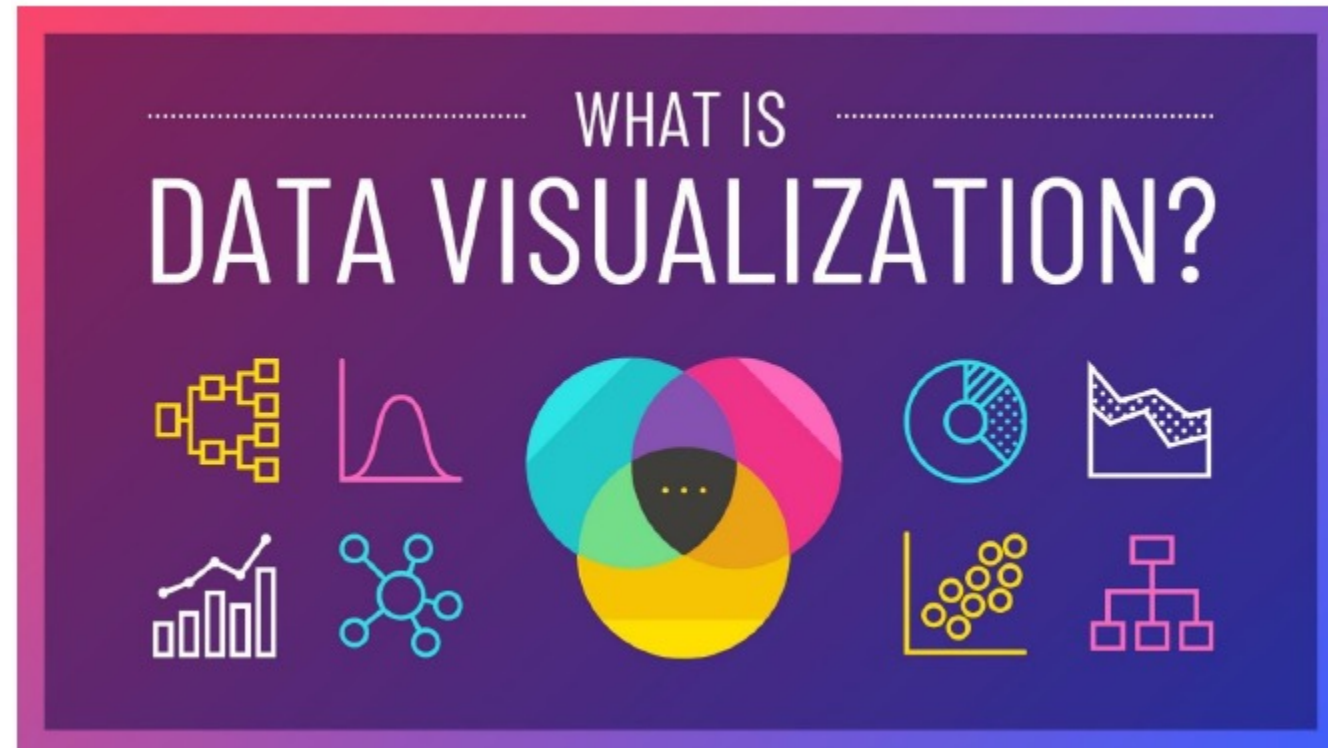
```
##ekstraksi peubah
#ekstraksi nama merek HP
nama.hp <- data.hp$nama_hp
#identifikasi list nama HP
list.nama.hp <- c("Redmi","Poco","Xiaomi","Asus","Samsung",
                  "Vivo","OPPO","Advan","Infinix","Huawei",
                  "Realme","Oppo","SAMSUNG","Sharp","POCO",
                  "RENO","VIVO","Evercross","xiomi","REDMI",
                  "samsung","ALDO","Tecno","REALME","XIAOMI",
                  "Wiko","Evercoss","Meizu","Haier","Lava","Itel",
                  "infinix","Alcatel","MI","ITEL","Aldo","Soyes",
                  "EVERCOSS","Galaxy","Mito","TECNO","oppo","MITO",
                  "Maxtron","opppo","vivo","Vivo","SHARP","Honor",
                  "ADVAN","Nokia","INFINIX","redmi")

m1.cek <- str_detect(nama.hp,paste(list.nama.hp, collapse = "|"))
sum(m1.cek)
nama.hp[!m1.cek]

#ekstrak nama HP
m2 <- str_extract_all(nama.hp,paste(list.nama.hp, collapse = "|"))
m3 <- NULL
for(i in 1:800){
  a <- paste(m2[i],collapse = " ")
  m3 <- c(m3,a)
}
m4 <- str_remove_all(m3,"[c(\\",,)]")
summary(as.factor(m4))
#namun masih perlu dicleaning!
```

Bagaimana
Ekstraksi peubah
RAM dan Memori Internal?

Visualisasi Data




penyajian informasi dalam bentuk gambar atau grafik yang diperoleh dari data melalui proses analitika

Did you know?

- 90% of the information transmitted to the brain is visual
- Humans process images 60,000 times faster than text
- 70% of our sensory receptors are in our eyes
- 65% of people are visual learners

In short, visual data is easier to remember than words.

Peranan Visualisasi dalam Proses Analisis Data

 **selama proses analisis data**

 **setelah proses analisis data**

Peranan Visualisasi dalam Proses Analisis Data

selama proses analisis data

- memahami karakteristik perilaku data yang dimiliki (eksplorasi)
- mengarahkan pendalaman-pendalaman analisis data (elaborasi)
- membangkitkan ide baru analisis data

Peranan Visualisasi dalam Proses Analisis Data

setelah proses analisis data

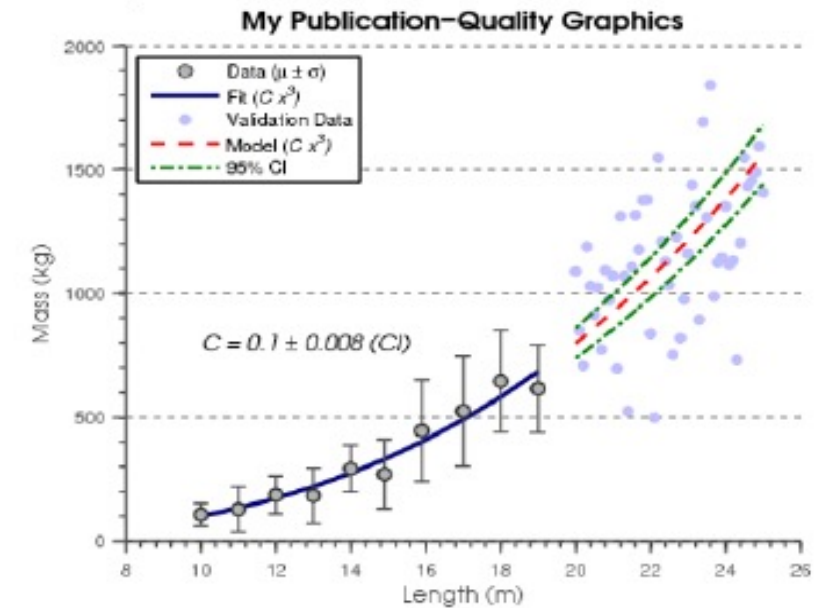
- Meringkas informasi pada data besar sehingga mudah melihat pola pada data dan memahami cerita di belakangnya
- Memudahkan menyampaikan informasi sehingga lebih cepat menyusun aksi
- Membantu pembuat keputusan memahami apa yang sedang atau telah terjadi
- Mengarahkan audiens untuk fokus pada hal yang dituju untuk diperhatikan
- Menyibak informasi yang tidak terlihat sebelumnya sehingga memudahkan menuliskan narasi dan laporan

Target audiens

For public



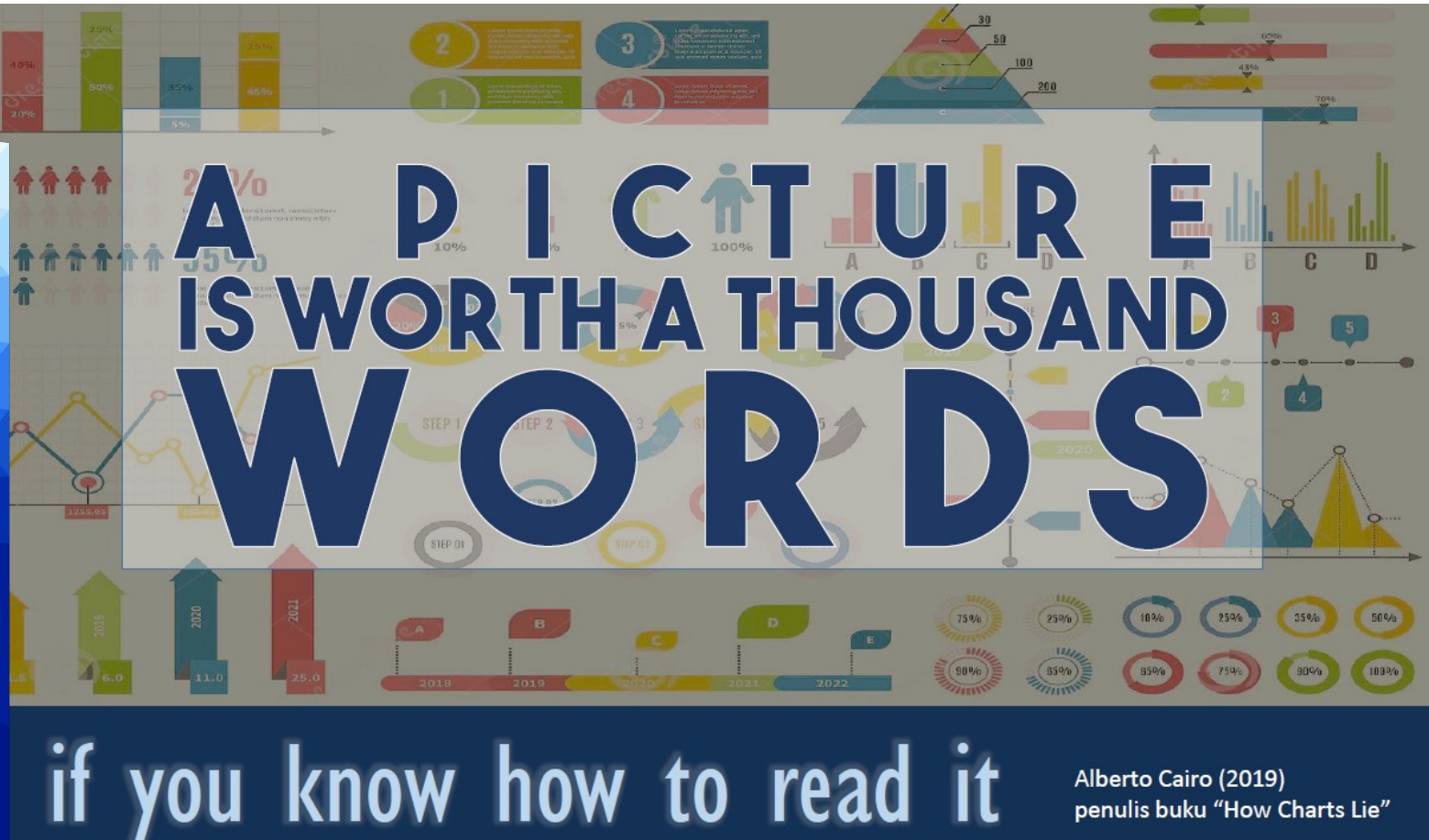
For professional colleagues



For administrators



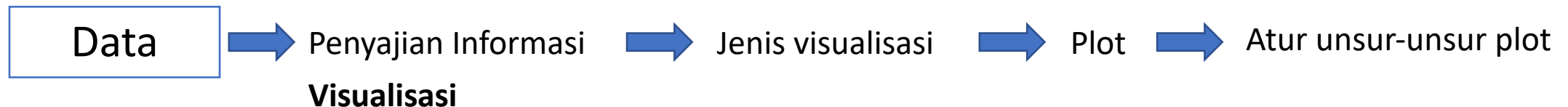
Skala dalam grafik (visualisasi)



- Skala menerjemahkan nilai menjadi isyarat visual
- Pertanyaan utamanya adalah bagaimana jarak dalam grafik data diterjemahkan menjadi perbedaan kuantitas yang berarti
- Tersesat dengan skala itu mudah → berpotensi mendistorsi informasi

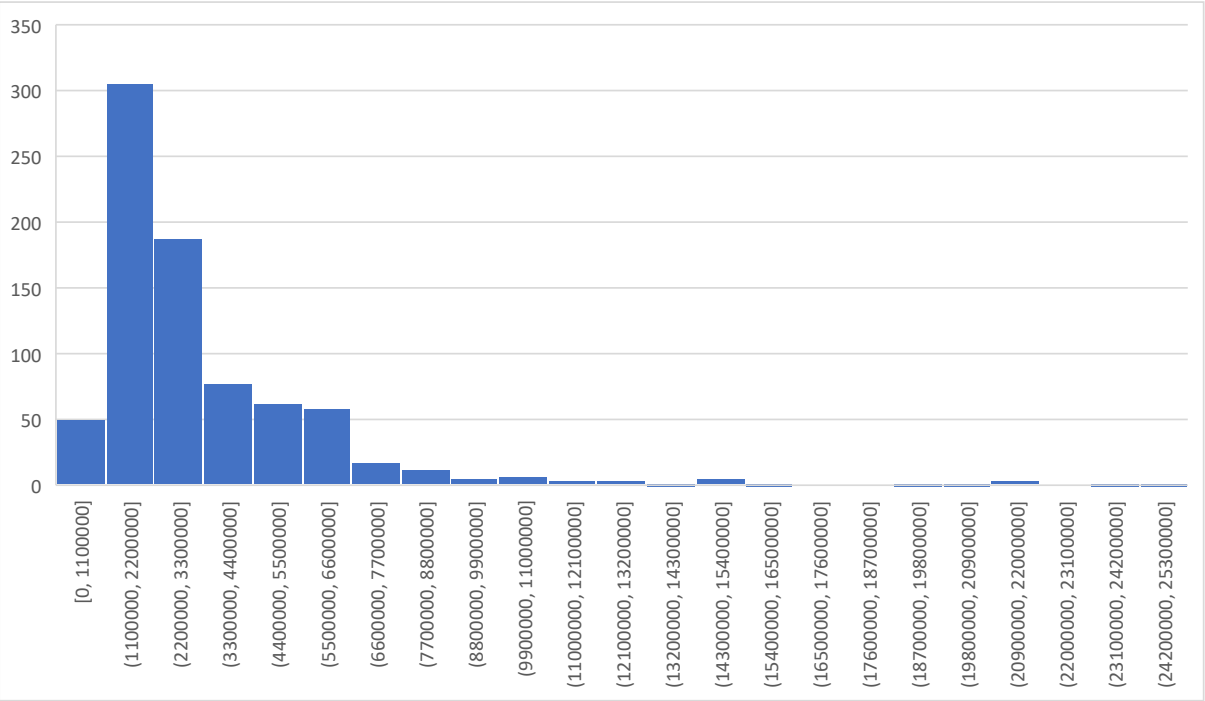
- Jenis visualisasi

1. Visualisasi Besaran dan Perbandingannya
2. Visualisasi Sebaran Data dan Perbandingannya
3. Visualisasi Proporsi
4. Visualisasi Hubungan Antar Variabel
5. Visualisasi Data Deret Waktu dan Trend
6. Visualisasi Geospatial
7. Visualisasi Aliran dan Jaringan

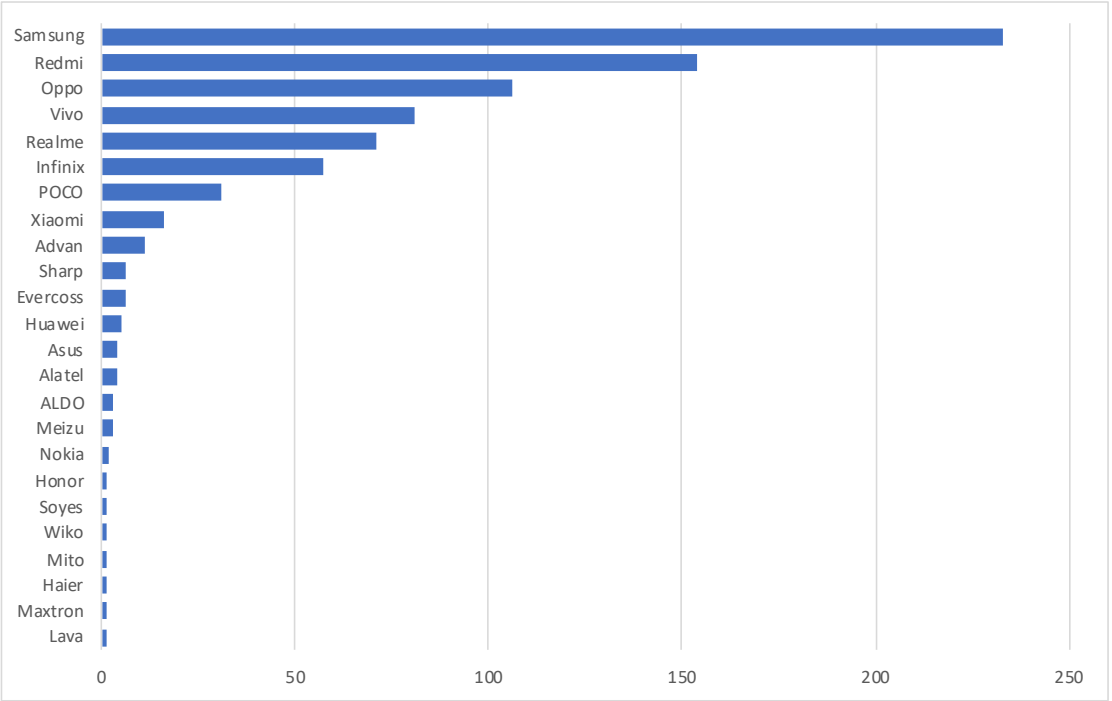


Perhatikan kembali data hasil web scraping Data Handphone Android setelah dilakukan proses regular expression

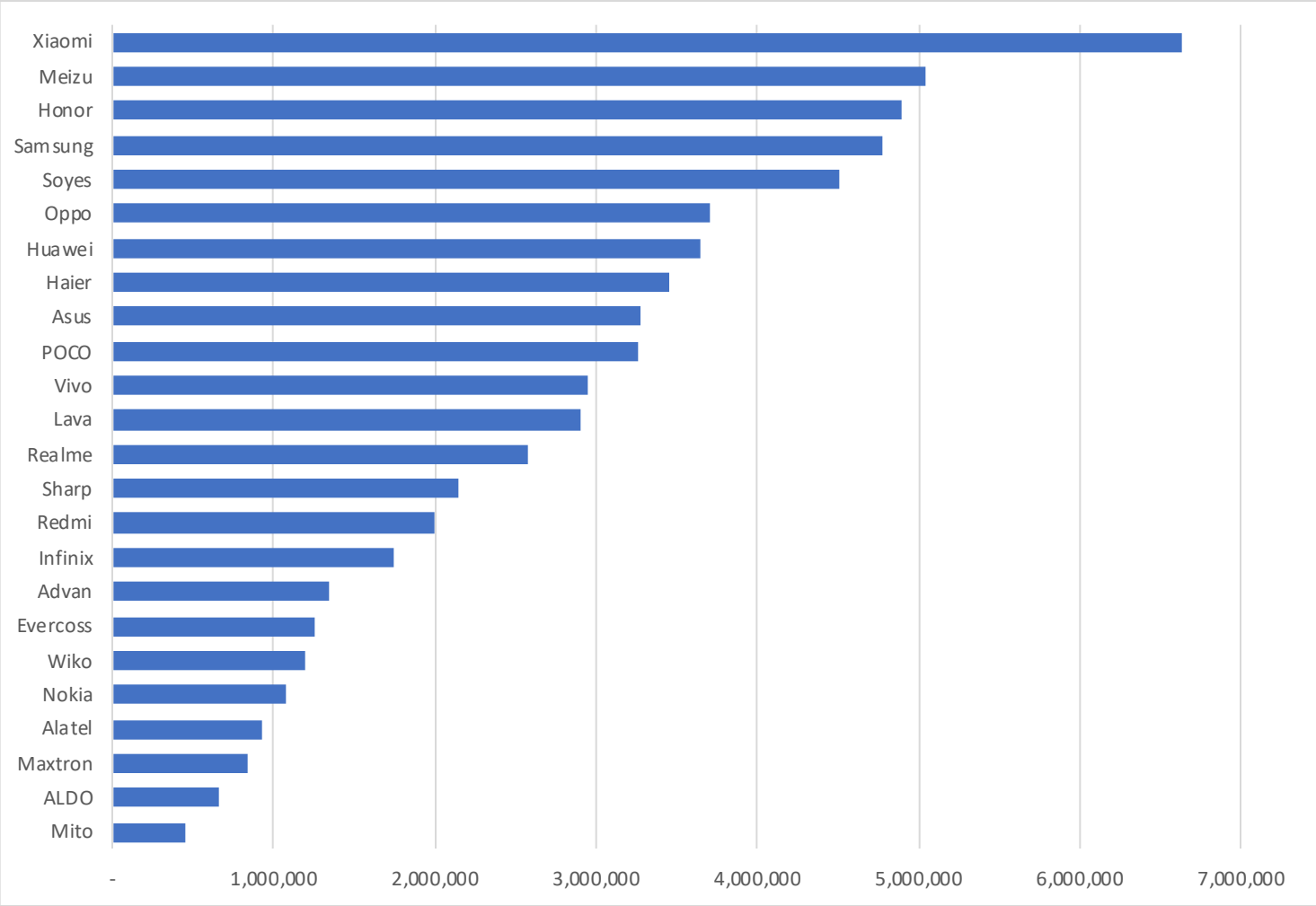
Visualisasi peubah harga



Visualisasi peubah nama HP



Harga berdasarkan Nama HP



dst

Projek

Berdasarkan data scraping yang diperoleh untuk topik yang ditentukan:

Topik	P1	P2
Topik 1: Harga rumah dan spesifikasinya	K4	K2
Topik 2: Harga laptop dan spesifikasinya	K2	K3
Topik 3: Harga mobil bekas dan spesifikasinya	K1	K1
Topik 4: Harga handphone dan spesifikasinya	K3	K4

Lakukanlah manajemen dan visualisasi data yang berguna!

Terima kasih 😊