



Pengenalan Aplikasi R

PROGRAM PEMBELAJARAN DARING KOLABORATIF

UM PALANGKA RAYA – STMIK PALANGKA RAYA



Pengantar R

- R merupakan suatu free software (freeware) untuk analisis data dan grafik yang didasarkan pada bahasa pemrograman S yang dikembangkan oleh Rick Becker, John Chambers, dan Allan Wilks pada tahun 1976.
- R hampir sama seperti software statistika lainnya seperti SPSS, MINITAB, S-plus, SAS, atau Eviews, yang di Indonesia masih menggunakan paket-paket statistik komersil.
- R project open source memungkinkan banyak pihak untuk memberikan kontribusi dalam pengembangan
- Tools statistik yang disediakan R antara lain: uji statistik klasik, analisis time series, klasifikasi, clustering, dll.
- Saat ini R banyak digunakan untuk visualisasi data, analisa statistik, machine learning (Educativa, 2024).



Buka halaman R project untuk download installer R:

https://cran.r-project.org/

Download and Install R

Precompiled binary distributions of the base system and contributed packages, **Windows and Mac** users most likely want one of these versions of R:

- Download R for Linux (Debian, Fedora/Redhat, Ubuntu)
- Download R for macOS
- Download R for Windows

R is part of many Linux distributions, you should check with your Linux package management system in addition to the link above.

Pilih installer sesuai dengan system operasi. Mislnya saya pulih 'Download R for Windows' dan pilih *install R for the first time*:



Pilih installer sesuai dengan system operasi. Mislnya saya pilih 'Download R for Windows' dan pilih *install R for the first time*:

R for Windows

Subdirectories:

<u>base</u>	Binaries for base distribution. This is what you want to install R for the first time .
<u>contrib</u>	Binaries of contributed CRAN packages (for $R \ge 4.0.x$).
old contrib	Binaries of contributed CRAN packages for outdated versions of R (for $R < 4.0.x$).
<u>Rtools</u>	Tools to build R and R packages. This is what you want to build your own packages on Windows, or to build R itself.

Please do not submit binaries to CRAN. Package developers might want to contact Uwe Ligges directly in case of questions / suggestions related to Windows binaries.

You may also want to read the <u>R FAQ</u> and <u>R for Windows FAQ</u>.

Note: CRAN does some checks on these binaries for viruses, but cannot give guarantees. Use the normal precautions with downloaded executables.



Pilih installer sesuai dengan system operasi. Mislnya saya pilih 'Download R for Windows' dan pilih *install R for the first time*:

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Saat ini berada di versi 4.4.0 dan tekan tombol download.

Download R-4.4.0 for Windows (82 megabytes, 64 bit)

README on the Windows binary distribution New features in this version

This build requires UCRT, which is part of Windows since Windows 10 and Windows Server 2016. On older systems, UCRT has to be installed manually from <u>here</u>.

If you want to double-check that the package you have downloaded matches the package distributed by CRAN, you can compare the <u>md5sum</u> of the .exe to the <u>fingerprint</u> on the master server.

Tunggu proses unduh installer dan jika sudah 100% terunduh klik file tersebut untuk mulai install R.

- Langkah 1, jalankan file installer R yang sudah diunduh
- Langkah 2, Pilih Bahasa untuk instalasi, misalnya English, kemudian tekan OK.

Select	Setup Language	×
_ ↓	Select the language to use during the ins	tallation.
	English	~
	OK Ca	incel

• Langkah 3, lanjut pilih Next.







• Langkah 4, Pilih lokasi tujuan hasil instalasi. Sementara biarkar. default dan pilih Next.

Setup - R for Windows 4.4.0	- 🗆	×	Setup - R for Windows 4.4.0 —	
Select Destination Location Where should R for Windows 4.4.0 be installed?		R	Select Components Which components should be installed?	1
Setup will install R for Windows 4.4.0 into the following folde	r.		Select the components you want to install; clear the components you do n install. Click Next when you are ready to continue.	ot want to
Cl/Drogram Eilos/D/D 4.4.0	CIICK DIOWSE.		User installation	
	Browse		🔽 Main Files	92,5 M
			✓ 64-bit Files	73,4 M
			Message translations	10,2 M
			Current selection requires at least 179,0 MB of disk space.	
Back	ext C	ancel		
	1		Back Next	Ca

• Langkah 5, lanjut pilih Next saat pilih komponen



•	Langkah	6,	Pilih	default	yaitu	No.
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Setup - R for Windows 4.4.0	– 🗆 🗙	Setup - R for Windows 4.4.0 - X
Startup options Do you want to customize the startup options?	R	Select Start Menu Folder Where should Setup place the program's shortcuts?
Please specify yes or no, then click Next. Yes (customize startup) No (accept defaults)		 Setup will create the program's shortcuts in the following Start Menu folder. To continue, click Next. If you would like to select a different folder, click Browse. Browse
Back	Next Cancel	Back Next Cancel

• Langkah 7, biarkan default untuk membuat shortcut R dan pilih Next.



• Langkah 6, Biarkan default dan pilih Next.

	Setup - R for Windows 4.4.0 —	×
Setup - R for Windows 4.4.0 - X Select Additional Tasks Which additional tasks should be performed?	Installing Please wait while Setup installs R for Windows 4.4.0 on your computer.	R
Select the additional tasks you would like Setup to perform while installing R for Windows 4.4.0, then click Next. Additional shortcuts: Create a desktop shortcut Create a Quick Launch shortcut Registry entries: Save version number in registry Associate R with .RData files	Extracting files C:\Program Files\R\R-4.4.0\doc\manual\fullrefman.pdf	
Back Next Cancel	Cano	cel

• Langkah 9, Tunggu sejenak proses instalasi.



• Langkah 10, Pilih **Finish** untuk menyelesaikan tahapan instalasi ĸ.



Bagaimana Menjalankan Aplikasi R



Setelah berhasil, jalankan R GUI sederhana melalui menu windows dan carı R 4.4.0., kemudian pilih dan jalankan aplikasi. Selanjutnya akan muncul jendela R seperti aambar berikut.



Bagaimana Menjalankan Aplikasi R



<pre>R R Console</pre>)
<pre>R version 4.4.0 (2024-04-24 ucrt) "Puppy Cup" Copyright (C) 2024 The R Foundation for Statistical Computing Platform: x86_64-w64-mingw32/x64 R is free software and comes with ABSOLUTELY NO WARRANTY. fou are welcome to redistribute it under certain conditions. Fype 'license()' or 'licence()' for distribution details. Natural language support but running in an English locale R is a collaborative project with many contributors. Fype 'contributors()' for more information and 'citation()' on how to cite R or R packages in publications. Fype 'demo()' for some demos, 'help()' for on-line help, or 'help.start()' for an HTML browser interface to help. Fype 'q()' to quit R. > print('hallo") 11 "hallo" > x<-1+2 > print(x) 11 3 > '</pre>	R Console		
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<pre>[1] "nallo" > x<-1+2 > print(x) [1] 3 ></pre>	<pre>> print('hallo')</pre>		
> x<1+2 > print (x) [1] 3 >	(I) "NALLO"		
	<pre>/ X\=174 > nrint(v)</pre>		
×	11 3		
· · · · · · · · · · · · · · · · · · ·			
		*	

Coba aplikasi dengan mengetik "print('hallo'), maka akan muncul ouput yaitu tulisan berwarna biru "hallo".

Kita juga bisa melakukan operasi penjumlahan dengan R.

Ketik "x<-1+2" lalu ketik "print(x)"

Maka R akan memberikan jawaban 3 dengan tulisan berwarna biru.

Panduan Mengunduh R Studio



R studio adalah sebuah software Integrated Development Environment (IDE) yang bersifat terbuka dan gratis serta sering digunakan dalam pemrograman berorientasi statistic.

R studio juga merupakan pelengkap program R karena R studio memiliki tampilan antar muka yang lebih terstruktur dan lebih lengkap sehingga dapat memudahkan dalam proses pengolahan dan analisis data, Adapun program R masih bersifat dasar/basic. Dengan demikian, tujuan penggunaan R studio adalah untuk memudahkan penggunaan program R.

Instalasi R studio ke dalam perangkat computer sendiri biasanya dilakukan setelah menginstal program R. Program R studio memiliki banyak tampilan dan beberapa fitur yang masing-masing memiliki fungsi. Jadi, perbedaan antara R basic dengan R studio terletak pada tampilan antar muka atau *user interface*.

Panduan Mengunduh R Studio



- Unduh R studio di https://www.rstudio.com/products/rstudio/download/.,
- Kita bisa langsung mengunduh installer versi terbaru dengan klik:

>DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS

• Atau jika ingin menggunakan versi sebelumnya bisa pilih All installer.

Pilih sesuai dengan system operasi perangkat computer yang digunakan.

2: Install RStudio

DOWNLOAD RSTUDIO DESKTOP FOR WINDOWS

Size: 215.66 MB | SHA-256: D3C03C42 | Version: 2023.12.1+402 | Released: 2024-01-29

Grow your data science sl	tills at posit::conf(2024) August 12th-14th in	Seattle	LEARN MORE							
posit products ~	posit products - solutions - learn & support - explore more - pricing									
OS	Download	Size	SHA-256							
Windows 10/11	RSTUDIO-2023.12.1-402.EXE ±	215.66 MB	D3C03C42							
macOS 12+	RSTUDIO-2023.12.1-402.DMG ±	382.66 MB	C8D9185D							
Ubuntu 20/Debian 11	RSTUDIO-2023.12.1-402-AMD64.DEB ±	149.27 MB	81F221BE							







• Langkah 1, klik file aplikasi R studio yang telah diunduh.



 Langkah 2, setelah muncul seperti gambar di atas, kemudian Pilih Next

Panduan Instalasi R Studio



 Langkah 3, Pilih lokasi tujuan hasil instalasi R studio, kemudian pilih Next.

🕞 RStudio Setup		×	🕞 RStudio Setup		_		×
	noose Install Location Choose the folder in which to install RStudio.		6	Choose Start Menu Folder Choose a Start Menu folder for the RStu	udio shorto	uts.	
Setup will install RStudio in the and select another folder. Click	following folder. To install in a different folder, dick Brow Next to continue.	vse	Select the Start Menu fol can also enter a name to	der in which you would like to create the pro- create a new folder.	gram's sho	rtcuts. You	L
Destination Folder C:\Program Files\RStudio Space required: 860.8 MB Space available: 75.5 GB	Browse		7-Zip Accessibility Accessories Administrative Tools Anaconda3 (64-bit) Android Studio CapCut Chrome Apps Cisco Packet Tracer Discord Inc DroidCam				
Nullsoft Install System v3.08 ——	< Back Next > C	ancel	Do not create shortcu Nullsoft Install System v3.08	< Back In	stall	Canc	el

 Langkah 4, Biarkan default untuk membuat shortcut kemudian pilih Install.







• Langkah 5, Tunggu sejenak proses instalasi. Pilih finish untuk menyelesaikan tahap instalasi.

🕞 RStudio Setup —		🕞 RStudio Setup	_	
Installing Please wait while RStudio is being installed.			Completing RStudio Setup	
Extract: quarto.js			RStudio has been installed on your computer.	
Show details			Click Finish to close Setup.	
Nullsoft Install System v3.08				
< Back Next >	Cancel		< Back Finish	Cancel

Panduan Instalasi R Studio





• Langkah 6, Buka aplikasi Rstudio nya dari menu aplikasi dan jika muncul pilihan seperti pada gambar di samping, maka pilih versi R yang sesuai dengan perangkat computer yang digunakan kemudian klik OK.

Choose R Installation	×
RStudio requires an existing installation of R.	
Please select the version of R to use.	
 Use your machine's default 64-bit version of R Use your machine's default 32-bit version of R Choose a specific version of R: 	
[64-bit] C:\Program Files\R\R-4.4.0	•
You can also customize the rendering engine used by RStudio.	
Rendering Engine: Auto-detect (recommended) V	
Browse OK Cancel	

Panduan instalasi R Studio





• Selanjutnya akan muncul tampilan seperti ini dan artinya aplikasi R studio sudah bisa digunakan.

RStudio	-	
File Edit Code View Plots Session Build Debug Profile Tools Help		
🖸 🗸 🧠 🖌 🕞 🔚 📥 🛛 interfunction	\$	Project: (None) 🔹
Source	Environment History Connections Tutorial	_
Console Terminal × Background Jobs ×	🚰 🔒 📰 Import Dataset 🔹 🌒 97 MiB 🔹 🔏	🗏 List 🔹 🖂 🗸
R 44.0 · ~/	R • Global Environment •	
<pre>R version 4.4.0 (2024-04-24 ucrt) "Puppy Cup" Copyright (C) 2024 The R Foundation for Statistical Computing Platform: x86_64-w64-mingw32/x64 R is free software and comes with ABSOLUTELY NO WARRANTY. You are welcome to redistribute it under certain conditions. Type 'license()' or 'licence()' for distribution details. Natural language support but running in an English locale R is a collaborative project with many contributors. Type 'contributors()' for more information and</pre>	Environment is empty	
'citation()' on how to cite R or R packages in publications.		
Type 'demo()' for some demos, 'help()' for on-line help, or	Files Plots Packages Help Viewer Presentation	
'help.start()' for an HTML browser interface to help. Type ' $a(\lambda)$ ' to guit B		
Type q() to quit k.	A Name Size Modified	
>	Image: Provide a state of the stat	, 3:48 PM 🔺
	□ □ 111 11.7 KB May 8, 2020,	3:50 PM
	🗌 🖬 Agenda pembahasan.docx 15.3 KB May 13, 2022	2, 8:24 PM
	🗌 📝 Alamat Surat Barista.docx 17.1 KB Dec 1, 2022,	10:45 AM
	🗌 🧰 Audacity	
	🗌 🗹 Belum tercapainya nilai ambang batas he 12.8 KB Sep 30, 2022,	, 3:17 AM
	Book1.xlsx 12.6 KB Oct 2, 2023, 3	3:45 PM
	Custom Office Templates	

Antar muka R

- Sisi kiri bawah: console window (disebut juga command window). Di jendela ini pengguna dapat menuliskan perintah setelah prompt ">" kemudian R akan mengeksekusi perintah tersebut. Console window adalah jendela yang paling penting, disinilah R benar-benar melakukan sesuatu sesuai perintah
- 2) Sisi kiri atas: editor window (disebut juga script window). Kumpulan perintah (scripts) dapat diedit dan disimpan. Untuk membuka editor window yang baru klik File-> New->Rscript. Tidak cukup hanya dengan mengetik perintah di editor window tersebut untuk menjalankan perintah harus masuk ke command window. Untuk menjalankan baris dari editor window (atau keseluruhan script, klik Run atau tekan ctrl+enter untuk mengirimkannya ke command window.
- Sisi kanan atas: workspace/ history window. Di jendela ini pengguna dapat melihat data-data dan nilai-nilai yang disimpan dalam memori R.
- Sisi kanan bawah: files/ plots/ packages/ help/ viewer window. Di jendela ini pengguna dapat membuka *files*, melihat plot (termasuk plot sebelumnya), menginstal dan memuat *packages* atau menggunakan fungsi *help*.



Bagaimana Cara Kerja R?



R dapat digunakan secara interaktif

Hasil perhitungan segera dapat dilihat

Untuk perhitungan yang lebih kompleks, perintah-perintah R ditulis terlebih dahulu

Setelah R terinstal dan dijalankan pada komputer,akan terlihat prompt ">" yang menunjukkan bahwa R siap menunggu perintah.

R merupakan suatu bahasa berorientasi objek, artinya bahwa variabel, data, fungsi, hasil dsb, disimpan dalam memori aktif komputer dalam bentuk objek dan mempunyai sebuah nama.

Memulai R



Aktifkan Rstudio, sehingga muncul gambar berikut.

8 RStudio							- 0	×
File Edit Code View Plots Session Build Debug Profile Tools Help								
• • • • • • • • • • • • • • • • • • •	ins 👻						Project: (N	lone) 🔻
Console Terminal ×	Ð	Environment	History	Connections	Tutorial		_	
~/ 🔅	4	🚰 🔒 🖙 I	mport Data	set 👻 💉			\equiv List \bullet	G -
By vention 4 0 2 (2020 06 22) "Taking off Again"		🛑 Global Envir	onment 👻			Q		
Copyright (C) 2020 The R Foundation for Statistical	Computing	Data						
Platform: x86_64-w64-mingw32/x64 (64-bit)		🜔 datalati	han 9	4 obs. of	5 variab	les		
P is free software and comes with ABSOLUTELY NO WAR		🜔 datanila	i1 4	0 obs. of	4 variab	les		
You are welcome to redistribute it under certain co	nditions.	🜔 datanila	ifix 4	5 obs. of	4 variab	les		•
Type 'license()' or 'licence()' for distribution de	tails.	Files Plots	Packages	Help Vi	ewer		_	
R is a collaborative project with many contributors		🧅 📦 🖉 🐲						
Type 'contributors()' for more information and 'citation()' on how to cite R or R packages in publ	ications.							
Type 'demo()' for some demos, 'help()' for on-line	help, or							
Type $'q()'$ to quit R.	p.							
[Workspace loaded from ~/.RData]								
>								

Memulai R



Pilih File->New File->R Script

Studio Edit Code View	Plots Session	Build	Debug	Profile	Tools	Help								_	٥
New File		•	R Script		Ctrl+S	hift+N	ldins 👻							🚯 Pr	oject: (None
New Project			R Noteb	ook				Envire		Histowy	Common		Tutovial		_
Open File Reopen with Encoding Recent Files	Ctrl+O	•	R Markd Shiny W	lown eb App					nment	Import Data	aset 👻 🧃	etions	Tutoriai		List - G
Open Project			Flumber	Arta			. <u></u>	Data		onnent				~	
Open Project in New Sessio	n		C File C++ File	,			^	🔘 dat	talati	han 9	04 obs.	of !	5 variables	5	
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Input data ke R

 Data dapat diinputkan secara langsung di command window, seperti berikut.

data = c(1, 2, 3, 4, 4, 4, 5, 6, 7, 8, 8, 9)

 Data berupa file excel juga dapat diinputkan ke R dengan menggunakan fasilitas import data yang terdapat di workspace/history window atau dapat juga menuliskan script secara langsung di command window (lihat contoh). Import Data

Klik Import Dataset->pilih From Excel

Setelah muncul kotak dialog Import Excel Data, klik Browse

Setelah muncul kotak dialog Choose File, pilih file datalatihan.xlsx ->klik Open->klik Import

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data = c(1, 2, 3, 4, 4, 4, 5, 6, 7, 8, 8,

Ukuran Pemusatan

Ukuran pemusatan merupakan suatu gambaran (informasi) yang memberikan penjelasan bahwa data memiliki satu (mungkin lebih) titik dimana dia memusat atau terkumpul.

1. Rata-rata hitung (mean)

Sintaks dasar:

mean(x,trim=0,na.rm=FALSE,...)

- X merupakan data input
- Trim digunakan apabila ingin menghapus beberapa nilai dari sisi data
- Na.rm bernilai logika. FALSE berarti missing data dilibatkan dalam perhitungan. TRUE berarti data missing dihilangkan dalam perhitungan rata-rata.

Ukuran Pemusatan

Misalnya dimiliki data pada R sbb: data = c(1, 2, 3, 4, 4, 4, 5, 6, 7, 8, 8, 9)

Maka untuk mendapatkan mean (rata-rata hitung) dapat digunakan fungsi mean() sbb.

> mean(data)
[1] 5.083333

2. Median

untuk mendapatkan median (nilai tengah) dapat digunakan fungsi median sbb.

Sintaks dasar:

median(x,na.rm=FALSE,...)

Ukuran Pemusatan

Misalnya dimiliki data pada R sbb:

data = c(1, 2, 3, 4, 4, 4, 5, 6, 7, 8, 8, 9)

Maka untuk mendapatkan median dapat digunakan fungsi median() sbb. > median(data) [1] 4.5

3. Modus

Ada beberapa cara untuk menghitung modus yaitu dengan cara manual (function) atau menggunakan packages.

Gata - C(1, 2, 3, 4, 4, 4, 3, 0, 1, 0, 0,

Ukuran Pemusatan

Modus dengan function

Misalnya dimiliki data pada R sbb:

data = c(1, 2, 3, 4, 4, 4, 5, 6, 7, 8, 8, 9)

Untuk mendapatkan modus dapat digunakan cara berikut.

```
> modus<-function(x){freq<-table(x)#tabulasi data
+ hasil<-freq[max(freq)==freq]#memilih data yang sering mun
cul
+ return(hasil)}#pengembalian nilai function
> modus(data)#memanggil fungsi modus
4
3
```

Berdasarkan output, 4 adalah nilai yang paling sering muncul yaitu sebanyak 3 kali.

Ukuran Pemusatan

Modus dengan package

Untuk menghitung modus bisa menggunakan Package prettyR. Gunakan sintaks berikut untuk menginstal dan menjalankan Package.

- > #install packages jika belum terpasang di R
 > install.packages("prettyR")
- > #jalankan package bila penginstalan berhasil
- > library(prettyR)

Gunakan fungsi Mode(x,na.rm=FALSE) untuk menghitung modus menggunakan Package prettyR.

```
> data=c(1,2,3,4,4,4,5,6,7,8,8,9)
> Mode(data)
[1] "4"
```


Ukuran penyebaran data memberikan gambaran seberapa besar data menyebar dalam kumpulannya.

1. Range (jangkauan) Sintaks dasar:

range(x,na.rm=FALSE,...)

Contoh:

- > #buat vektor data
- > data=c(1,2,3,4,4,4,5,6,7,8,8,9)
- > #hitung range
- > min.max<-range(data)</pre>
- > print(min.max)
- [1] 1 9
- > diff(min.max)
- [1] 8

2.Varian (σ²) dan standar Deviasi (σ) Sintaks dasar menghitung varian: var(x,y=NULL,na.rm=FALSE,use)

Sintaks dasar menghitung Standar Deviasi

sd(x,na.rm=FALSE)

Contoh.

Tentukan varians dan standar deviasi dari data : 1,2,3,4,4,4,5,6,7,8,8,9

```
> #buat vektor data
> data=c(1,2,3,4,4,4,5,6,7,8,8,9)
> #hitung varians
> varians<-var(data)
> print(varians)
[1] 6.44697
> #hitung standar deviasi
> deviasi<-sd(data)
> print(deviasi)
[1] 2.539088
```


Selain menggunakan fungsi-fungsi statistik tersebut, kita dapat juga menggunakan fungsi numSummary() yang terdapat pada package RcmdrMisc dan fungsi basicStats() pada package fBasics untuk mencari ukuran pemusatan dan penyebaran. Bila packages tersebut belum terpasang di R, silakan instal dengan sintaks berikut.

install.packages("RcmdrMisc")

install.packages("fBasics")

Latihan 1

Berikut data nilai UAS mata kuliah statistika dari 12 mahasiswa.

Lakukan analisis deskriptif terhadap data tersebut menggunakan fungsi numSummary() dan basicStats() untuk melihat ukuran pemusatan dan penyebarannya.

No.	Nilai
1	85
2	70
3	58
4	78
5	67
6	98
7	68
8	82
9	64
10	78
11	70
12	80

Penyelesaian.

Import data yang telah diketik di excel dan disimpan dengan nama "datadeskriptif"

dengan mengikuti langkah-langkah import data, sehingga tampak berikut ini.

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Penyelesaian.

1. Analisis data deskriptif dengan menggunakan fungsi fBasics().

> #pemusatar	n dan penye	ebaran data	dengan	package	fBasics
> library(f	Basics)				
> basicState	s(datadeskı	riptif,ci=0.	.95)		
	No.	Nilai			
nobs	12.000000	12.000000			
NAs	0.000000	0.00000			
Minimum	1.000000	58.000000			
Maximum	12.000000	98.00000			
1. Quartile	3.750000	67.750000			
3. Quartile	9.250000	80.500000			
Mean	6.500000	74.833333			
Median	6.500000	74.000000			
Sum	78.000000	898.000000			
SE Mean	1.040833	3.130576			
LCL Mean	4.209142	67.942982			
UCL Mean	8.790858	81.723684			
Variance	13.000000	117.606061			
Stdev	3.605551	10.844633			
Skewness	0.000000	0.456518			
Kurtosis	-1.501603	-0.569621			

Penyelesaian.

2. Analisis data deskriptif dengan menggunakan fungsi

numSummary()

- > #pemusatan dan penyebaran data dengan package RcmdrMisc
- > library(RcmdrMisc)

```
> numSummary(datadeskriptif,statistics=c("mean","sd","se(me
an)","IQR","quantiles","cv","skewness","kurtosis"),quantile
s=c(0,0.25,0.5,0.75,1),type="3")
```

sd se(mean) IQR mean CV 6.50000 3.605551 1.040833 5.50 0.5547002 No. Nilai 74.83333 10.844633 3.130576 12.75 0.1449171 skewness kurtosis 0% 25% 50% 75% 100% n 1 3.75 6.5 0.0000000 - 1.50160269.25 12 12 No. Nilai 0.4565181 -0.5696208 58 67.75 74.0 80.50 98 12

> #pemusatan dan penyebaran data dengan fungsi standar R
> summary(datadeskriptif)

No).	Nilai				
Min.	: 1.00	Min.	:58.00			
1st Qu.	: 3.75	1st Qu.	:67.75			
Median	: 6.50	Median	:74.00			
Mean	: 6.50	Mean	:74.83			
3rd Qu.	: 9.25	3rd Qu.	:80.50			
Max.	:12.00	Max.	:98.00			

Beberapa penyajian data yang sering digunakan adalah diagram garis, diagram batang

histogram, diagram lingkaran, Boxplot, Scatterplot, dll.

1. Boxplot

Dalam pemrograman R kita dapat menggunakan fungsi boxpot(x) untuk membuat

Boxplot.

Sintaks dasar:

boxplot(x,data,notch,varwidth,names,main,col)

- X adalah data berupa vektor atau formula
- Data adalah data frame
- Notch adalah nilai logical, jika TRUE maka garis median pada boxplot berbentuk cekuk
- Varwidth adalah nilai logical.tetapkan nilai TRUE untuk proporsi lebar Boxplot
- Names adalah label masing-masing boxplot
- Main adalah pemberian judul pada diagram
- Col untuk pemberian warna pada boxplot

Kita akan gunakan data bawaan software R yaitu dataset Airquality

Berikut deskriptif dataset tersebut.

```
> #Penyajian Data
> #Membuat Boxplot
> str(airquality)
'data.frame': 153 obs. of 6 variables:
 $ Ozone : int 41 36 12 18 NA 28 23 19 8 NA ...
 $ Solar.R: int 190 118 149 313 NA NA 299 99 19 194 ...
 $ Wind
         : num 7.4 8 12.6 11.5 14.3 14.9 8.6 13.8 20.1 8.
6
         : int 67 72 74 62 56 66 65 59 61 69 ...
  Temp
 $ Month : int 5 5 5 5 5 5 5 5 5 ...
                1 2 3 4 5 6 7 8 9 10 ...
 S
  Day
         : int
```

AND ALEMEN INFORMATIVE DE LA CONTRACTIVE DE LA C

Penyajian Data

> boxplot(airquality\$0zone)

> boxplot(airquality\$Ozone,main="Boxplot variabel Ozone",xl ab="Parts per Billion",ylab="Ozone",col="cyan4",border="gol d",horizontal=TRUE,notch=TRUE)

Boxplot variabel Ozone

Parts per Billion

2. Diagram garis

Sintaks dasar:

```
plot(v,type,col,xlab,ylab)
```

Contoh:

Buatlah diagram garis untuk menyajikan data berikut: 2,7,12,5,10,20,4,1

```
> #diagram garis
> v<-c(2,7,12,5,10,20,4,1)
> plot(v,type="o")
```


Pemberian label judul, warna, border

> plot(v,type="o",xlab="Bulan",ylab="Pendapatan",main="Diagram Garis Pendapatan per Bulan",col="blue")

Diagram Garis Pendapatan per Bulan

- > #menggambar beberapa diagram garis
- > v<-c(2,7,12,5,10,20,4,1)#contoh data pendapatan dalam satuan
 juta</pre>
- > t<-c(1.5,5.5,10,6,7,12,2,0.8)#contoh data pengeluaran dalam satuan juta
- > plot(v,type="o",xlab="Bulan",ylab="Pendapatan",main="Diagram Garis Pendapatan per Bulan",col="blue")
- > lines(t,type="o",col="red")

Diagram Garis Pendapatan per Bulan

Bulan

3. Diagram lingkaran

Sintaks pie(x,labels,radius,main,col,clockwise)

Contoh:

Buatlah diagram lingkaran tingkat kepuasan berikut: 25,27,14,30,17

> x<-c(25,27,14,30,17)
> label<-c("sangat setuju","setuju","kurang setuju","tidak set
uju","sangat tidak setuju")
> warna<-c("coral","chartreuse","cadetblue","cyan","brown")
> pie.persen<-round(100*x/sum(x),1)#persentase data
> pielabel<-paste(pie.persen,"%",sep="")#penggabungan label
> #diagram lingkaran
> pie(x,labels=label,main="Diagram Lingkaran Tingkat Kepuasa
n",col=rainbow(length(x)))

Diagram Lingkaran Tingkat Kepuasan

4. Histogram

Sintaks dasar:

hist(x,main,xlab,col,border)

Contoh:

Buatlah histogram menggunakan dataset airquality > hist(airquality\$0zone,col="blue")

Histogram of airquality\$Ozone

5. Scatterplot

Sintaks dasar:

plot(x,y,main,xlab,ylab,xlim,ylim,axes)

Contoh:

Buatlah scatterplot untuk menyajikan data menggunakan dataset airquality bawaan R.

Berikut deskriptif dataset airquality:

> plot(x,y,main="Scatterplot Variabel Ozone dan Temperatur",xl ab="Ozone",ylab="Temperatur",xlim=c(0,200),ylim=c(0,150),col ="blue")

Scatterplot Variabel Ozone dan Temperati

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