



Pembelajaran Mesin (*Machine Learning*)



Konsep Dasar Machine Learning

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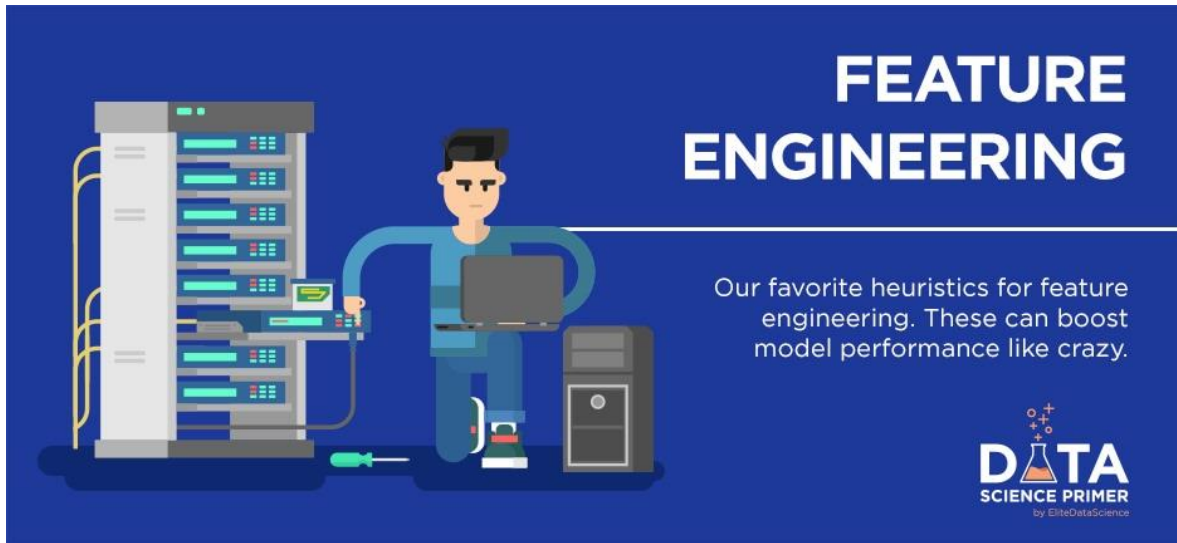
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Istilah-Istilah Umum Machine Learning

1. **Dataset**
2. **Feature/Attribute**
3. **Instance**
4. **Label/Target/
Class**
5. **Data Training**
6. **Data Testing**
7. **Model**

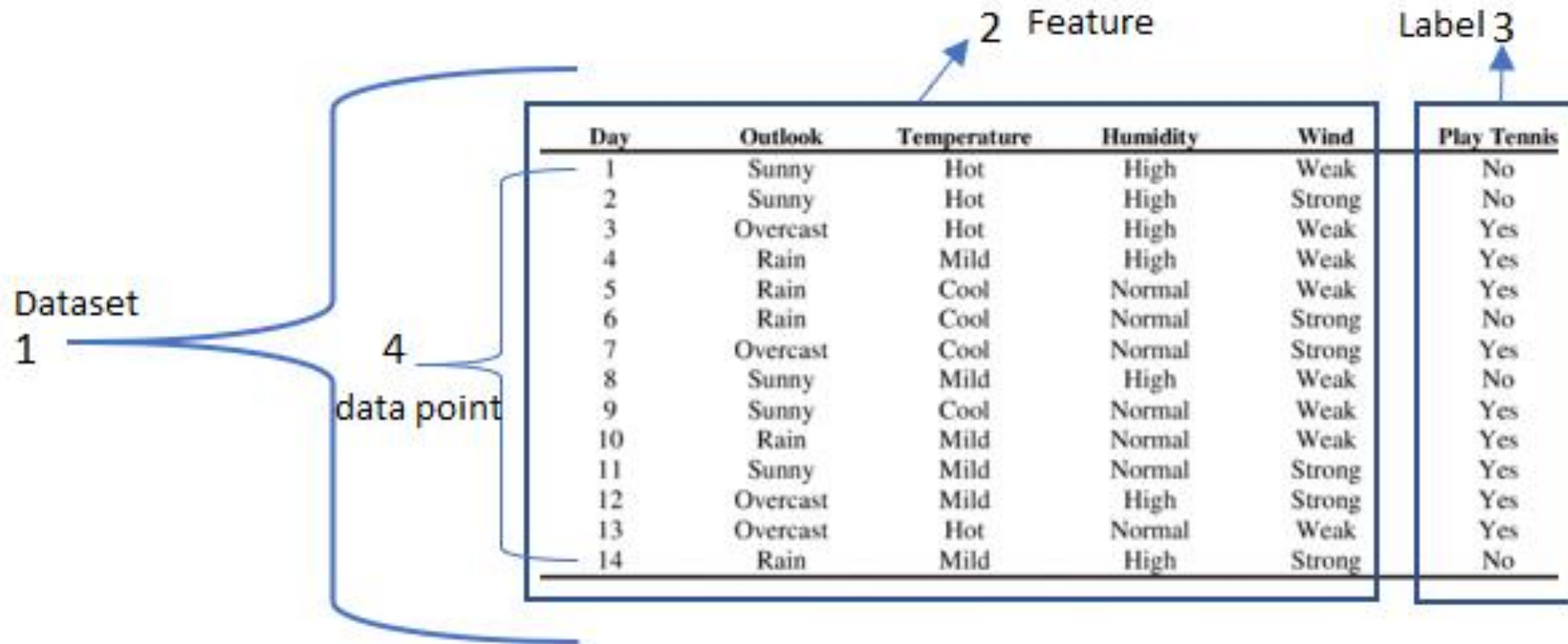




Feature/Attribute

- Fitur adalah satu kolom yang berada dalam dataset;
- Fitur merupakan **predictor**, yang menjadi referensi untuk melakukan prediksi


Feature/Attribute



Feature/Attribute

Predictors/Attributes

Target



Outlook	Temperature	Humidity	Windy	Play Tennis
Overcast	Hot	High	FALSE	Yes
Overcast	Cool	Normal	TRUE	Yes
Overcast	Mild	High	TRUE	Yes
Overcast	Hot	Normal	FALSE	Yes
Rainy	Cool	Normal	FALSE	Yes
Rainy	Mild	Normal	TRUE	Yes
Rainy	Hot	High	FALSE	No
Rainy	Hot	High	TRUE	No
Rainy	Mild	High	FALSE	No
Sunny	Mild	High	FALSE	Yes
Sunny	Cool	Normal	FALSE	Yes
Sunny	Mild	Normal	FALSE	Yes
Sunny	Cool	Normal	TRUE	No
Sunny	Mild	High	TRUE	No

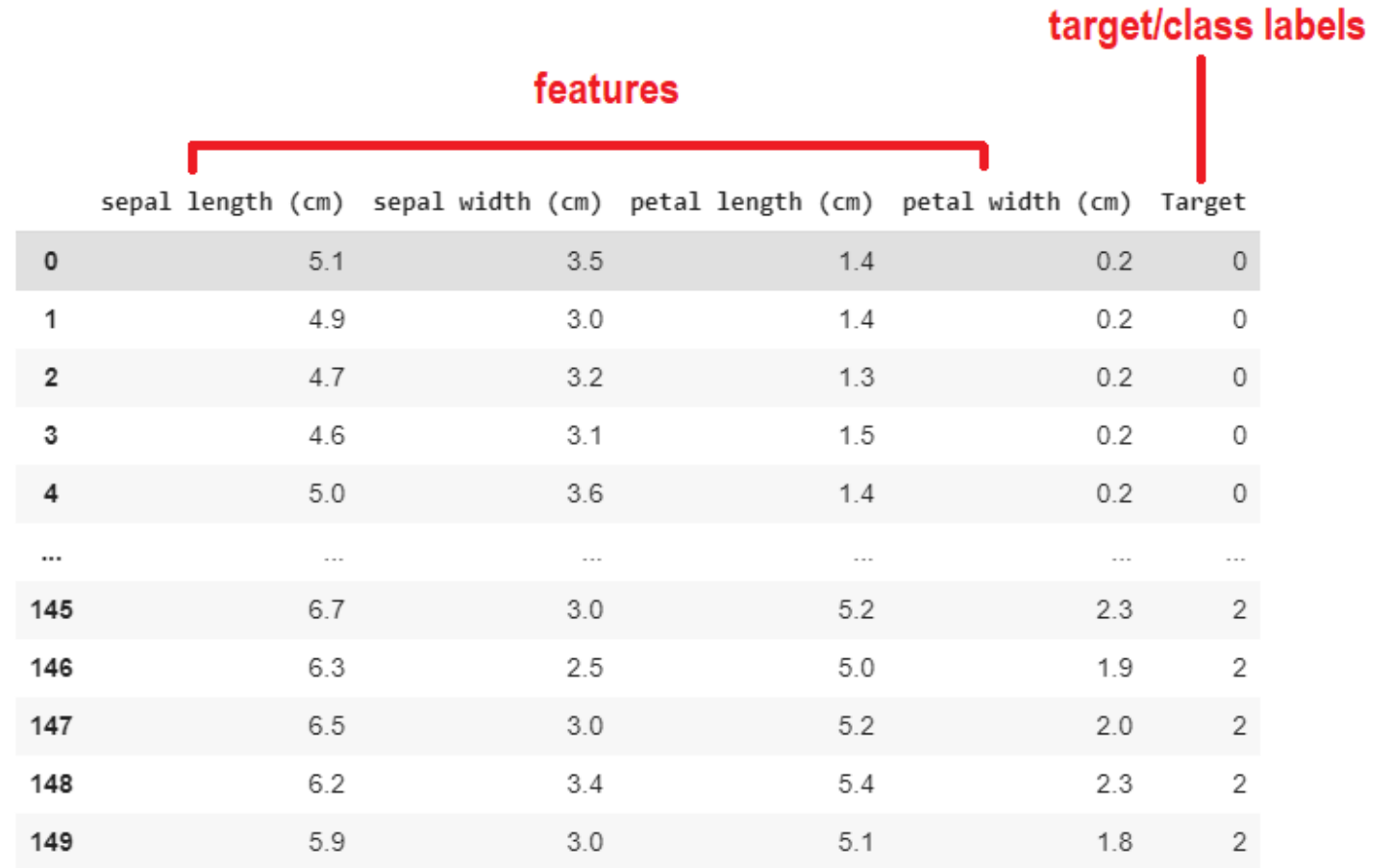
Instance

	Name	Sex	Age	Height	Weight
1	Alfred	M	14	69	112.5
2	Alice	F	13	56.5	84
3	Barbara	F	13	65.3	98
4	Carol	F	14	62.8	102.5
5	Henry	M	14	63.5	102.5
6	James	M	12	57.3	83
7	Jane	F	12	59.8	84.5
8	Janet	F	15	62.5	112.5
9	Jeffrey	M	13	62.5	84
10	John	M	12	59	99.5
11	Joyce	F	11	51.3	50.5
12	Judy	F	14	64.3	90
13	Louise	F	12	56.3	77
14	Mary	F	15	66.5	112
15	Philip	M	16	72	150
16	Robert	M	12	64.8	128
17	Ronald	M	15	67	133
18	Thomas	M	11	57.5	85

Mudahnya, instance adalah baris pada tabel atau dataset.

Label/Class/Target

Label atau Class atau Target adalah luaran yang ingin diprediksi.



	sepal length (cm)	sepal width (cm)	petal length (cm)	petal width (cm)	Target
0	5.1	3.5	1.4	0.2	0
1	4.9	3.0	1.4	0.2	0
2	4.7	3.2	1.3	0.2	0
3	4.6	3.1	1.5	0.2	0
4	5.0	3.6	1.4	0.2	0
...
145	6.7	3.0	5.2	2.3	2
146	6.3	2.5	5.0	1.9	2
147	6.5	3.0	5.2	2.0	2
148	6.2	3.4	5.4	2.3	2
149	5.9	3.0	5.1	1.8	2

150 rows × 5 columns

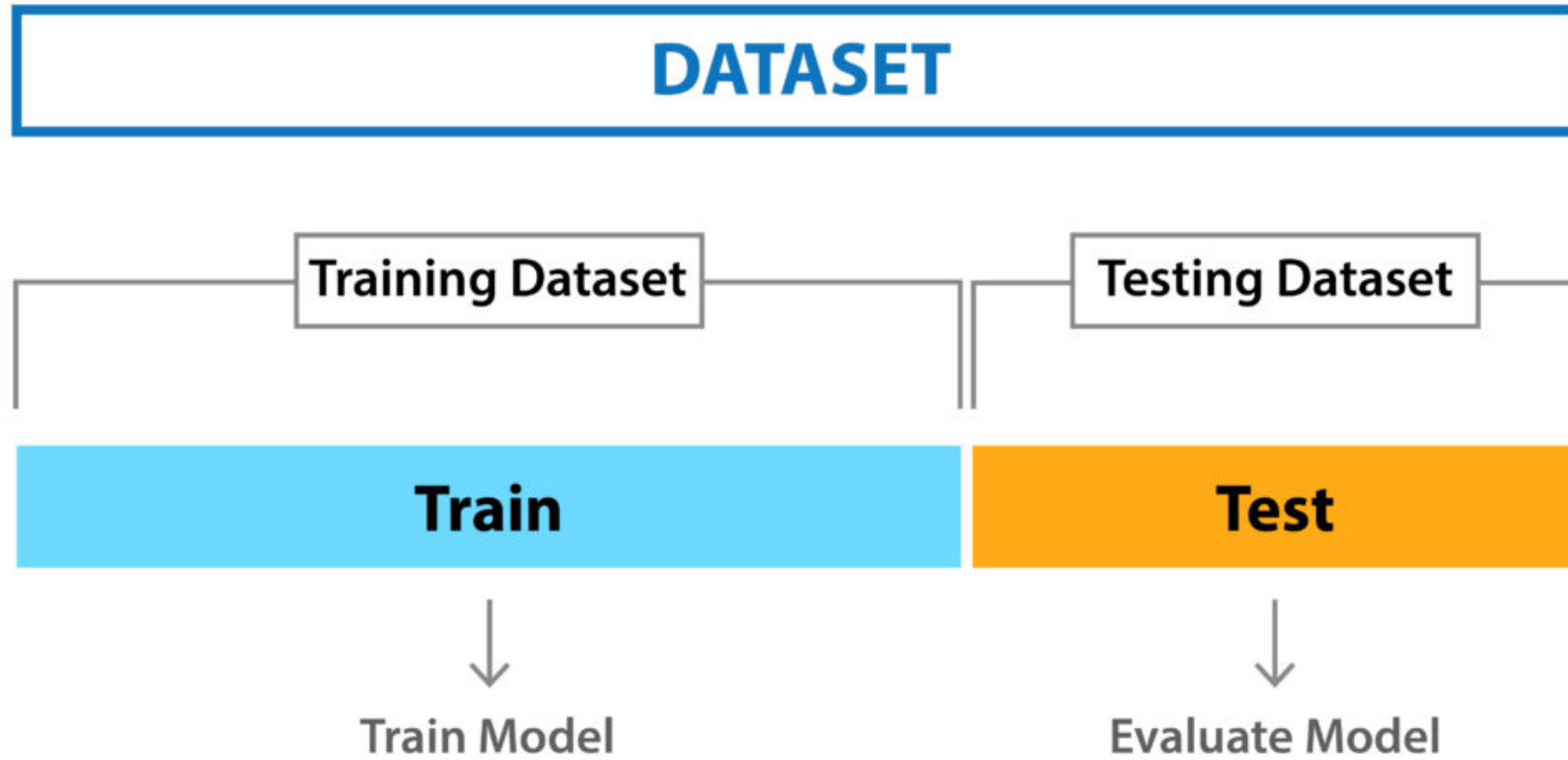
Data Training dan Testing

Total Dataset

	A	B	C	D	E
1	sepal_leng	sepal_widt	petal_leng	petal_widt	Species
2	5.1	3.5	1.4	0.2	setosa
3	4.9	3	1.4	0.2	setosa
4	4.7	3.2	1.3	0.2	setosa
5	4.6	3.1	1.5	0.2	setosa
6	5	3.6	1.4	0.2	setosa
7	5.4	3.9	1.7	0.4	setosa
8	4.6	3.4	1.4	0.3	setosa
9	5	3.4	1.5	0.2	setosa
10	4.4	2.9	1.4	0.2	setosa
11	4.9	3.1	1.5	0.1	setosa
12	5.4	3.7	1.5	0.2	setosa
13	4.8	3.4	1.6	0.2	setosa
14	4.8	3	1.4	0.1	setosa
15	4.3	3	1.1	0.1	setosa
16	5.8	4	1.2	0.2	setosa
17	5.7	4.4	1.5	0.4	setosa
18	5.4	3.9	1.3	0.4	setosa
19	5.1	3.5	1.4	0.3	setosa
20	5.7	3.8	1.7	0.3	setosa
21	5.1	3.8	1.5	0.3	setosa
22	5.4	3.4	1.7	0.2	setosa
23	5.1	3.7	1.5	0.4	setosa
24	4.6	3.6	1	0.2	setosa
25	5.1	3.3	1.7	0.5	setosa

Training Part of Data

Testing Part of Data



Data Training dan Testing




Proses Machine Learning



Model dalam *Machine Learning*

Langkah Umum Pembelajaran Mesin

1. Mengambil Dataset Mentah
 2. Membersihkan Dataset
 3. Membagi Dataset untuk Training dan Testing
 4. Menghasilkan Model
 5. Melakukan Prediksi dan Validasi
- 

Langkah Umum Pembelajaran Mesin

1. Download Dataset Mentah

No	ID Nasabah	Penghasilan Bulanan	Status Pernikahan	Jumlah Anak	Pernah Meminjam	Pernah Blokir	Memiliki Mobil	Nomor Handphone	Pinjamkan
1	00001	Rp 5.000.000	Ya	3	Ya	Tidak	Ya	0800-000-0000	Ya
2	00002	Rp 7.000.000	Tidak	3	Ya	Tidak	Ya	0800-000-0001	Ya
3	00003	Rp 3.000.000	Ya	6	Ya	Tidak	Tidak	0800-000-0002	Ya
4	00004	Rp 5.000.000	Ya	2	Ya	Tidak	Ya	0800-000-0003	Ya
5	00005	Rp 3.000.000	Ya	4	Tidak	Tidak	Ya	0800-000-0004	Ya
6	00006	Rp10.000.000	Ya	3	Ya	Tidak	Tidak	0800-000-0005	Ya
7	00007	Rp 5.000.000	Tidak	2	Ya	Tidak	Ya	0800-000-0006	Tidak
8	00008	Rp 7.000.000	Ya	4	Ya	Tidak	Ya	0800-000-0007	Ya
9	00009	Rp 3.000.000	Ya	9	Ya	Ya	Ya	0800-000-0008	Ya
10	000010	Rp 5.000.000	Ya	3	Ya	Tidak	Tidak	0800-000-0009	Ya
11	000011	Rp 3.000.000	Ya	1	Tidak	Tidak	Tidak	0800-000-0010	Ya
12	000012	Rp10.000.000	Ya	3	Ya	Tidak	Tidak	0800-000-0011	Ya
13	000013	Rp 7.000.000		4	Tidak		Tidak	0800-000-0012	Ya
14	000014	Rp 3.000.000	Ya	5	Ya	Tidak	Tidak	0800-000-0012	Ya
15	000015	Rp 3.500.000	Tidak	6	Tidak	Tidak	Tidak	0800-000-0012	Ya

Langkah Umum Pembelajaran Mesin

2. Membersihkan Data

No	ID Nasabah	Penghasilan Bulanan	Status Pernikahan	Jumlah Anak	Pernah Meminjam	Pernah Blokir	Memiliki Mobsi	Nomor Handphone	Pinjamkan
1	00001	Rp 5.000.000	Ya	3	Ya	Tidak	Ya	0800-000-0000	Ya
2	00002	Rp 7.000.000	Tidak	3	Ya	Tidak	Ya	0800-000-0001	Ya
3	00003	Rp 3.000.000	Ya	6	Ya	Tidak	Tidak	0800-000-0002	Ya
4	00004	Rp 5.000.000	Ya	2	Ya	Tidak	Ya	0800-000-0003	Ya
5	00005	Rp 3.000.000	Ya	4	Tidak	Tidak	Ya	0800-000-0004	Ya
6	00006	Rp10.000.000	Ya	3	Ya	Tidak	Tidak	0800-000-0005	Ya
7	00007	Rp 5.000.000	Tidak	2	Ya	Tidak	Ya	0800-000-0006	Tidak
8	00008	Rp 7.000.000	Ya	4	Ya	Tidak	Ya	0800-000-0007	Ya
9	00009	Rp 3.000.000	Ya	9	Ya	Ya	Ya	0800-000-0008	Ya
10	000010	Rp 5.000.000	Ya	3	Ya	Tidak	Tidak	0800-000-0009	Ya
11	000011	Rp 3.000.000	Ya	1	Tidak	Tidak	Tidak	0800-000-0010	Ya
12	000012	Rp10.000.000	Ya	3	Ya	Tidak	Tidak	0800-000-0011	Ya
13	000013	Rp 7.000.000		4	Tidak		Tidak	0800-000-0012	Ya
14	000014	Rp 3.000.000	Ya	5	Ya	Tidak	Tidak	0800-000-0012	Ya
15	000015	Rp 3.500.000	Tidak	6	Tidak	Tidak	Tidak	0800-000-0012	Ya

Langkah Umum Pembelajaran Mesin

3. Membagi Data Training dan Testing

No	ID Nasabah	Penghasilan Bulanan	Status Pernikahan	Jumlah Anak	Pernah Meminjam	Pernah Blokir	Memiliki Mobil	Pinjamkan
1	00001	Rp 5.000.000	Ya	3	Ya	Tidak	Ya	Ya
2	00002	Rp 7.000.000	Tidak	3	Ya	Tidak	Ya	Ya
3	00003	Rp 3.000.000	Ya	6	Ya	Tidak	Tidak	Ya
4	00004	Rp 5.000.000	Ya	2	Ya	Tidak	Ya	Ya
5	00005	Rp 3.000.000	Ya	4	Tidak	Tidak	Ya	Ya
6	00006	Rp10.000.000	Ya	3	Ya	Tidak	Tidak	Ya
7	00007	Rp 5.000.000	Tidak	2	Ya	Tidak	Ya	Tidak
8	00008	Rp 7.000.000	Ya	4	Ya	Tidak	Ya	Ya
9	00009	Rp 3.000.000	Ya	9	Ya	Ya	Ya	Ya
10	000010	Rp 5.000.000	Ya	3	Ya	Tidak	Tidak	Ya
11	000011	Rp 3.000.000	Ya	1	Tidak	Tidak	Tidak	Ya
12	000012	Rp10.000.000	Ya	3	Ya	Tidak	Tidak	Ya
13	000014	Rp 3.000.000	Ya	5	Ya	Tidak	Tidak	Ya
14	000015	Rp 3.500.000	Tidak	6	Tidak	Tidak	Tidak	Ya

Apa yang Berubah?

Training

Testing

Langkah Umum Pembelajaran Mesin

4. Menghasilkan Model



Langkah Umum Pembelajaran Mesin

5. Prediksi dan Validasi

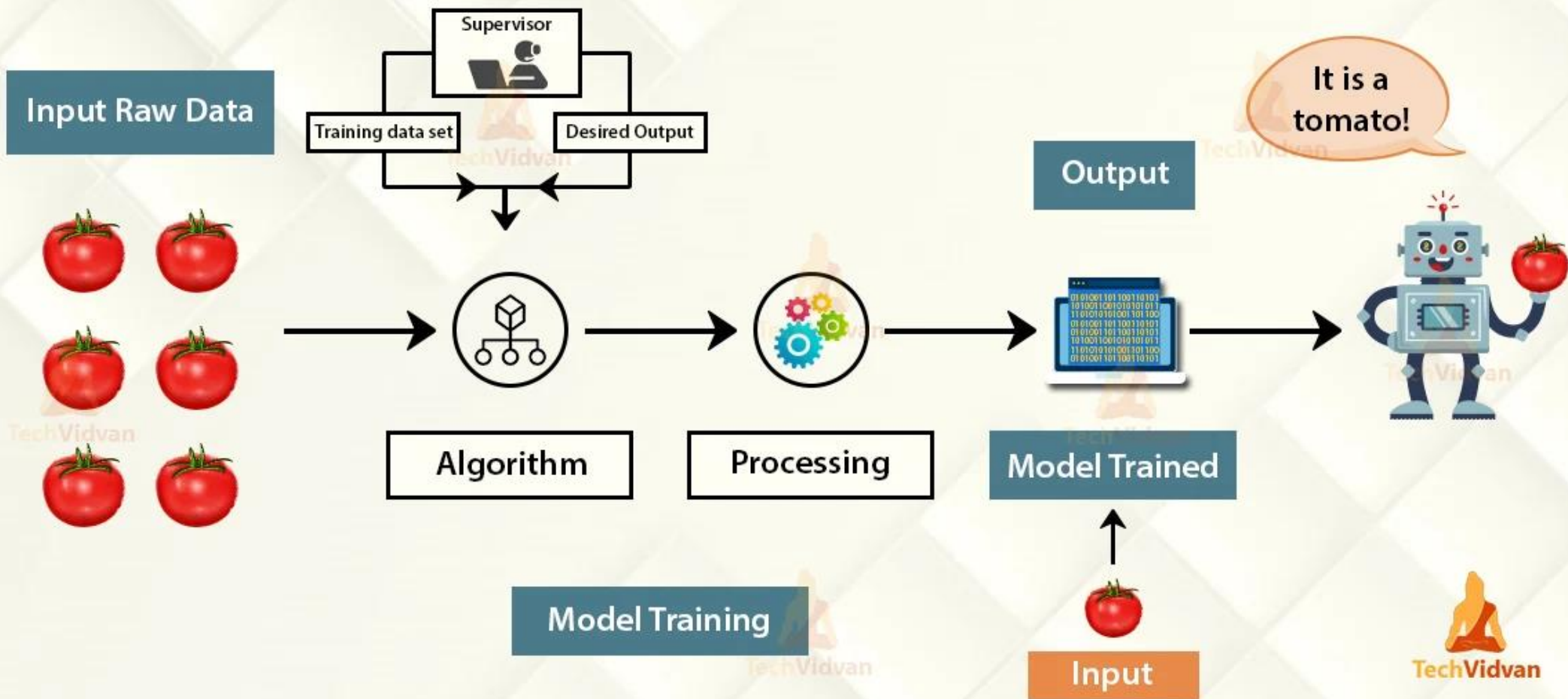
Pinjamkan

atau

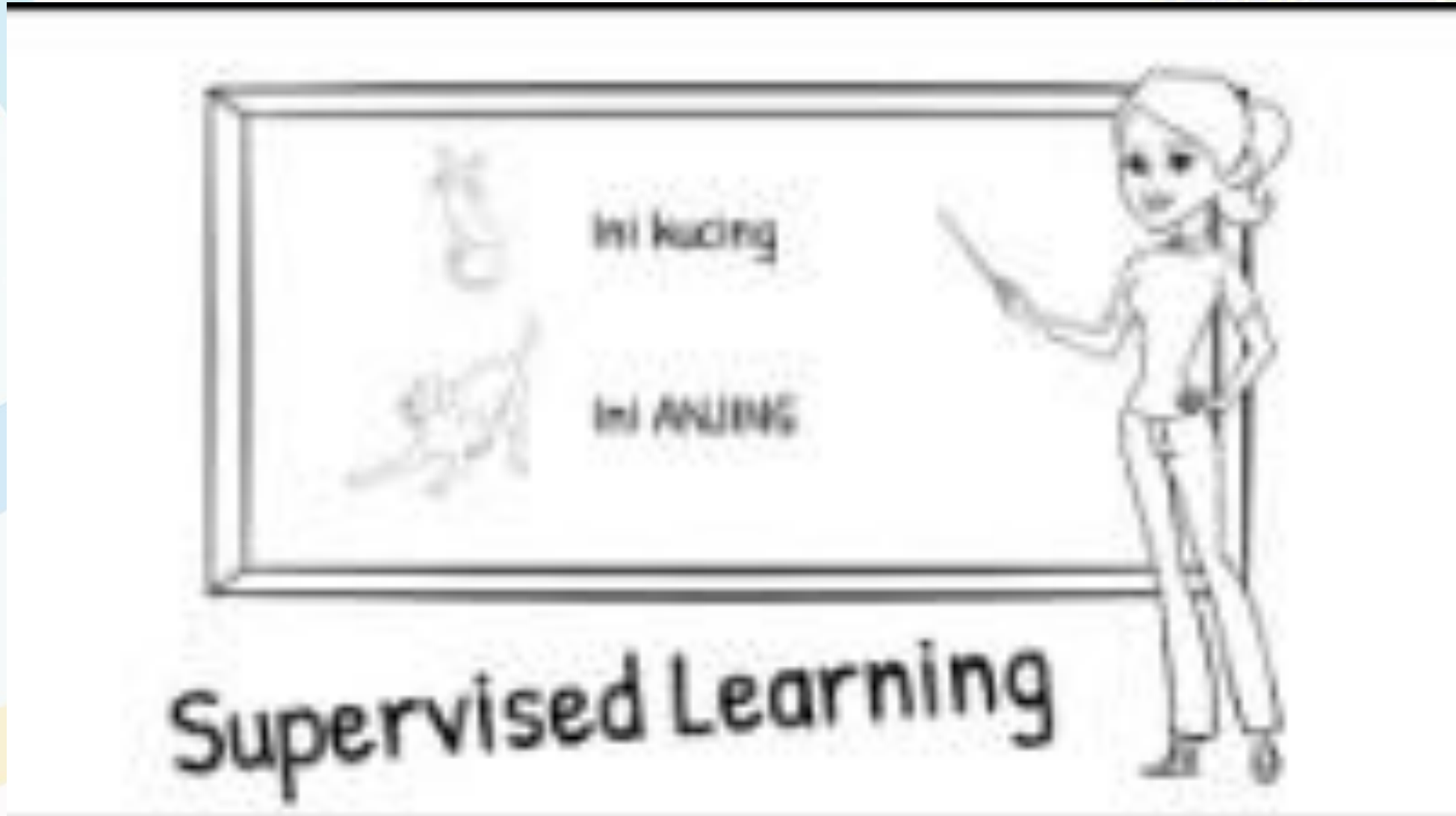
**Tidak
Pinjamkan**

Cara Kerja Machine Learning

Supervised Learning in ML

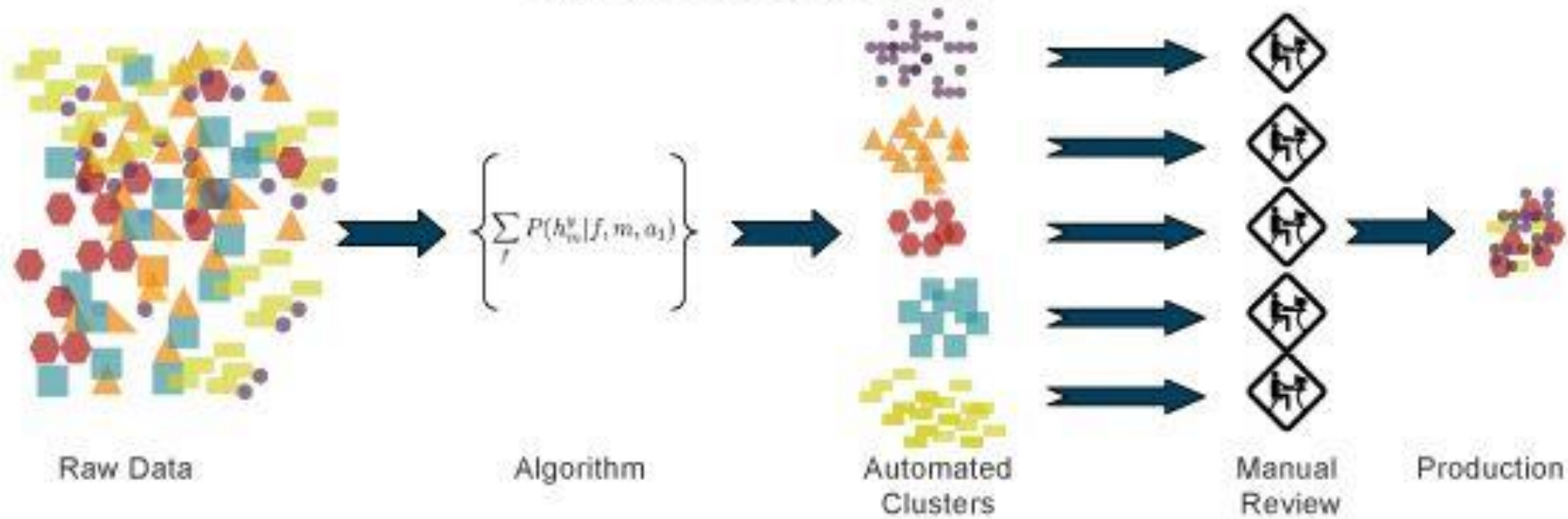


Konsep Implementasi Supervised Learning



UNSUPERVISED LEARNING

High reliance on algorithm for raw data, large expenditure on manual review for review for relevance and coding

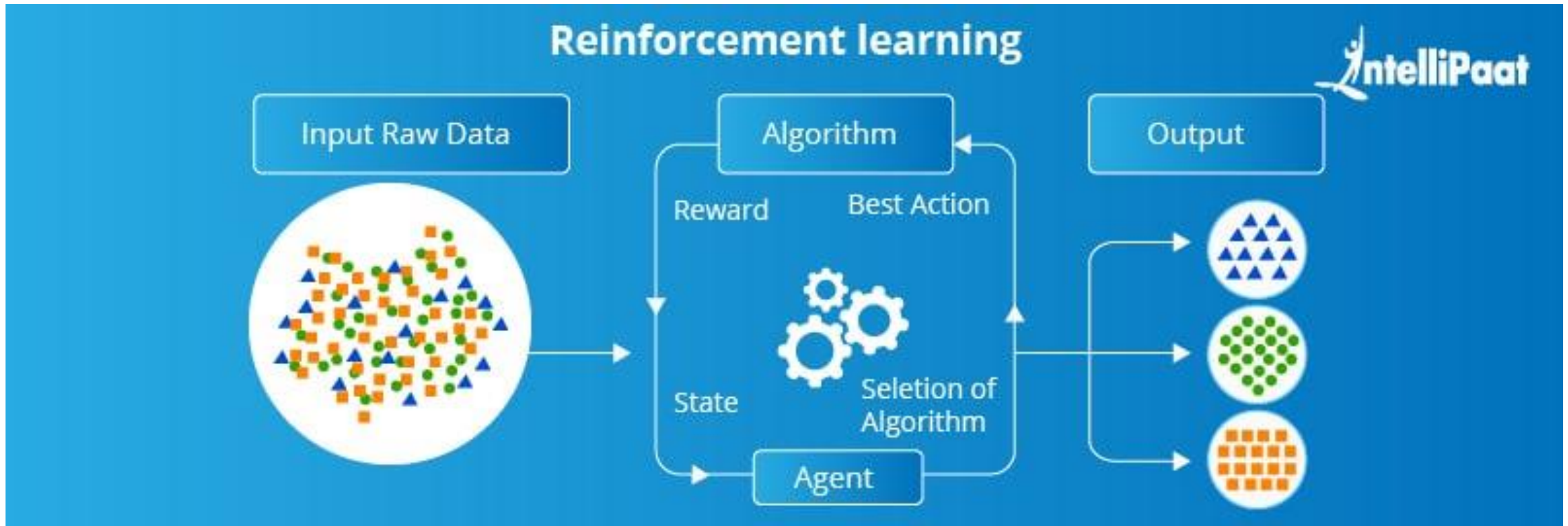


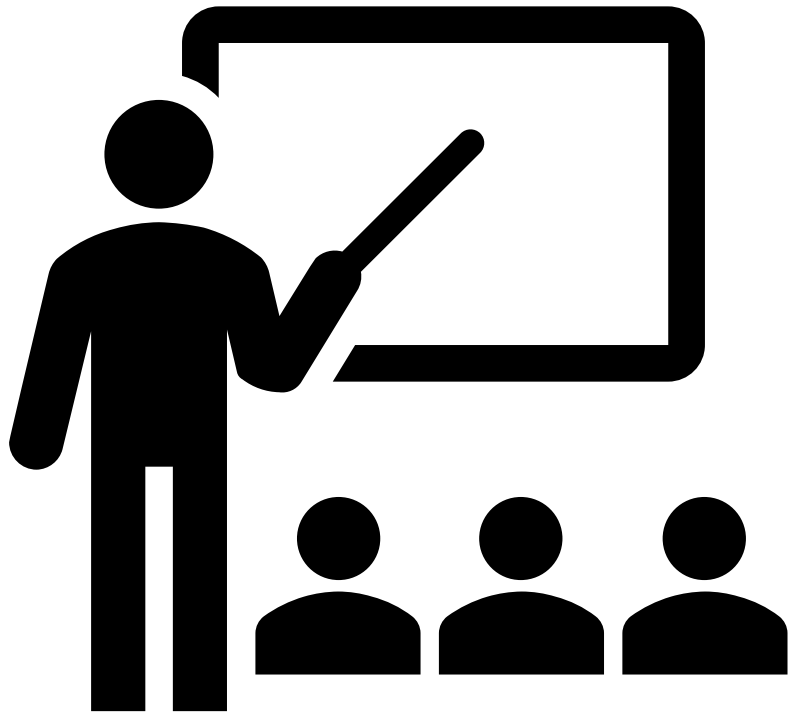
Cara Kerja Machine Learning

Perbedaan Supervised dan Unsupervised Learning



Cara Kerja Machine Learning





Jenis-Jenis Pembelajaran Mesin

1. Supervised Learning
(Belajar Terbimbing)
2. Semi-supervised Learning
(*Unsupervised*)
3. *Reinforcement Learning*

Insert Web Page

This app allows you to insert secure web pages starting with `https://` into the slide deck. Non-secure web pages are not supported for security reasons.

Please enter the URL below.

Note: Many popular websites allow secure access. Please click on the preview button to ensure the web page is accessible.

Daftar Pertanyaan

1. Dataset adalah?
2. Feature adalah?
3. Instance adalah?



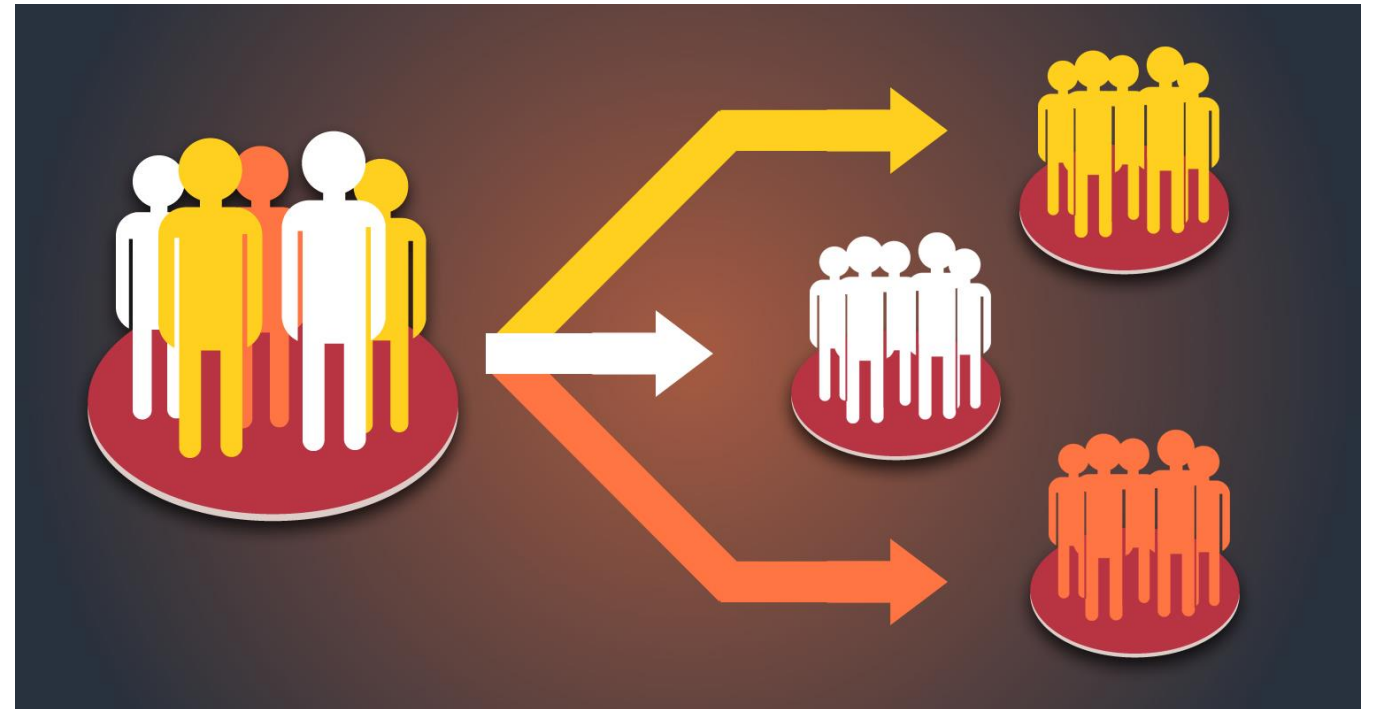
Deteksi E-mail SPAM

Supervised Learning



Segmentasi Konsumen atau Pembeli

Unsupervised Learning





Case Logic DCB-304
Compact System/Hybrid
Camera Case (Black)



Transcend 32 GB Class 10
SDHC Flash Memory Card
(TS32GSDHC10E)



CowboyStudio Professional
Neoprene Neck Strap
Neckstrap for NIKON



32GB Accessory Kit For
Nikon Coolpix B500, L330,
L340, L810 L820 L830 L840

Rekomendasi
Produk yang
Disukai

Unsupervised Learning

Prediksi Cuaca *Forecasting*



Supervised Learning

Deteksi Pelanggar Lalu Lintas (Tilang Elektronik)

Supervised Learning



Pembelajaran Mesin Menggunakan Python



Jenis-Jenis Bahasa Pemrograman

How programming languages got their names



Bash

Bash is an acronym for Bourne-again Shell, a pun on the Bourne Shell - named after creator Stephen Bourne - being "born again". 'Bash' is also a verb meaning 'to strike with a heavy blow', possibly from the Danish 'baske' meaning 'to beat, strike'.



Elixir

The word 'elixir', meaning a potion or essence that prolongs life or preserves something, stems from the Arabic 'al-iks' via the late Greek 'xerion', a powder for drying wounds. Appeared in Middle English from the 14th century.



JavaScript

Originally named Mocha, a type of fine quality coffee, it was later renamed JavaScript, combining Java, US slang for coffee, + 'Script', 'something that is written' from the Latin 'scriptum', 'a set of written words or writing'.



PHP

Originally known as Personal Home Page Construction Kit, this was later shortened to just PHP (an acronym for Personal Home Page). It is now accepted as the initials for PHP: Hypertext Preprocessor.



Ruby

Influenced by Perl, the developer chose a colleague's birthstone which followed it in the monthly sequence (June is Pearl, Ruby is July). Ruby comes from the Old French 'rubi', a 'reddish precious stone', and the Latin 'rubeus', 'red'.



SQL

First called "Structured English Query Language" (SEQUEL), pronounced "sequel", it was a pun that it was the sequel to QUEL. It was later shortened to SQL. The word 'sequel' stems from the Latin 'sequela' from 'sequi' meaning 'to follow'.



C

Quite simply C got its name because it was preceded by a programming language called B. C spawned its own children including C++ and C#. It is the third letter in the English alphabet and was originally identical to the Greek letter 'Gamma'.



Go

One of the Google developers said the name Go, sometime referred to as Golang, was chosen because it was 'short and easy to type'. The word 'go', meaning 'to travel or go somewhere' stems from the Old High German 'gān' (to go).



Kotlin

Inspired by Java, it was named after Kotlin Island in Russia. Originally called Kettusaari by the Finns ('fox island') and Ketlingen by the Swedes, (maybe stemming from 'kettel' meaning 'cauldron'). After Russia won control of the island in 1703 it was renamed 'Kotling' then 'Kotlin'.



Python

Creator Guido van Rossum named Python after TV comedy Monty Python's Flying Circus. The word 'python' comes from the ancient Greek 'Puthón', the name of a huge serpent killed by the god Apollo. Later adopted as a generic term for non-poisonous snakes that constrict their prey.



Rust

Rust's name comes from a fungus that is robust, distributed, and parallel. It is also a substring of robust. Rust, also the reddish coating formed on oxidized metal, stems from the German 'rost' and possibly the Indo-European base of 'red'.



Swift

The word 'swift' means 'moving with great speed or velocity' and can be traced back to the prehistoric 'swipt' meaning to 'move in a sweeping manner'. The swallow-like bird became known as a swift from the 17th century and is used as the language's logo.



Bahasa Pemrograman Populer (1—20)

Jul 2024	Jul 2023	Change	Programming Language	Ratings	Change
1	1		 Python	16.12%	+2.70%
2	3	▲	 C++	10.34%	-0.46%
3	2	▼	 C	9.48%	-2.08%
4	4		 Java	8.59%	-1.91%
5	5		 C#	6.72%	-0.15%
6	6		 JavaScript	3.79%	+0.68%
7	13	▲	 Go	2.19%	+1.12%
8	7	▼	 Visual Basic	2.08%	-0.82%
9	11	▲	 Fortran	2.05%	+0.80%
10	8	▼	 SQL	2.04%	+0.57%
11	15	▲	 Delphi/Object Pascal	1.89%	+0.91%
12	10	▼	 MATLAB	1.34%	+0.08%
13	17	▲	 Rust	1.18%	+0.29%
14	16	▲	 Ruby	1.16%	+0.25%
15	12	▼	 Scratch	1.15%	+0.08%
16	9	▼	 PHP	1.15%	-0.27%
17	18	▲	 Swift	1.13%	+0.25%
18	14	▼	 Assembly language	1.11%	+0.10%
19	20	▲	 COBOL	1.08%	+0.21%
20	26	▲	 Kotlin	1.05%	+0.35%

Syntax Bahasa Pemrograman

```
1 context.py 2³ utils.py •
12
13 class ContextPopException(Exception):
14     "pop() has been called more times than push()"
15     pass
16
17
18 class ContextDict(dict):
19     def __init__(self, context, *args, **kwargs):
20         super(ContextDict, self).__init__(*args, **kwargs)
21
22         context.dicts.append(self)
23         self.context = context
24
25     def __enter__(self):
26         return self
27
28     def __exit__(self, *args, **kwargs):
29         self.context.pop()
30
context.py [python][unix→utf-8] L17/267:C0 4%
```

Syntax adalah sebuah aturan yang digunakan untuk menulis kalimat agar mampu dimengerti oleh bahasa pemrograman

Program “Hello World”

- “Hello, World!” adalah sebuah program komputer yang menampilkan pesan serupa ke layar komputer saat seorang *programmer* mengetes hasil dari suatu bahasa pemrograman.
- Hampir seluruh bahasa pemrograman menggunakan pesan ini sebagai kata pembuka atau perkenalan ketika baru menggunakan bahasa pemrograman yang digunakan.
- Program ini awalnya ditulis oleh Brian Kernighan saat dirinya menulis dokumentasi bahasa pemrograman BCPL (Basic Combined Programming Language) sekaligus memberikan contoh dari program ini.



```
<hello-world/>
```



Bahasa Pemograman C

C is a procedural programming language. It was initially developed by Dennis Ritchie as a system programming language to write an operating system.

```
#include <stdio.h>

int main() {
    printf("Hello World");
    return 0;
}
```



```
/*package whatever //do not write package name here */  
  
import java.io.*;  
  
class GFG {  
    public static void main (String[] args) {  
        System.out.println("Hello World");  
    }  
}
```

Bahasa Pemograman Java

- *Java was created at Sun Microsystems, Inc., where James Gosling led a team of researchers in an effort to create a new language that would allow consumer electronic devices to communicate with each other. Work on the language began in 1991, and before long the team's focus changed to a new niche, the World Wide Web. Java was first released in 1995, and Java's ability to provide interactivity and multimedia showed that it was particularly well suited for the Web.*



```
#include <iostream>

int main() {
    std::cout << "Hello World";
    return 0;
}
```

Bahasa Pemograman C++

C++, high-level computer programming language. Developed by Bjarne Stroustrup of Bell Laboratories in the early 1980s, it is based on the traditional C language but with added object-oriented programming and other capabilities.



```
Imports System
```

```
Module Module1
```

```
Sub Main()
```

```
    Console.WriteLine("Hello World!")
```

```
    Console.WriteLine("Press Enter Key to Exit.")
```

```
    Console.ReadLine()
```

```
End Sub
```

```
End Module
```

Bahasa Pemograman Visual Basic

Visual Basic (VB) is an event-driven programming language and environment from Microsoft that provides a graphical user interface (GUI) which allows programmers to modify code by simply dragging and dropping objects and defining their behavior and appearance



```
echo "Hello World";
```

Bahasa Pemograman PHP

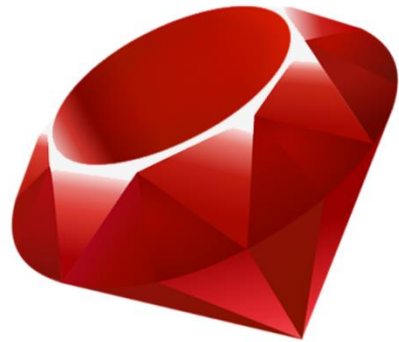
PHP started out as a small open source project that evolved as more and more people found out how useful it was. Rasmus Lerdorf unleashed the first version of PHP way back in 1994. PHP is a recursive acronym for "PHP: Hypertext Preprocessor"

Bahasa Pemograman Go



Go language is a programming language initially developed at Google in the year 2007 by Robert Griesemer, Rob Pike, and Ken Thompson. It is a statically-typed language having syntax similar to that of C

```
println("Hello World");
```



Ruby Programming

```
puts 'Hello World'
```

Bahasa Pemograman Ruby

Ruby is a pure object-oriented programming language. It was created in 1993 by Yukihiro Matsumoto of Japan. Ruby is open-source and is freely available on the Web, but it is subject to a license.

Bahasa Pemograman Perl

Perl is a general purpose, high-level interpreted and dynamic programming language. Perl supports both procedural and Object-Oriented programming.



```
#!/usr/bin/perl  
print "Hello World";
```



Bahasa Pemograman Python

Python is a widely-used, interpreted, object-oriented, and high-level programming language with dynamic semantics, used for general-purpose programming. It was created by Guido van Rossum, and first released on February 20, 1991.

```
print("Hello World")
```




Mengapa Memilih Python?

1. Bahasa/syntax mudah dipahami;
2. Mudah dipelajari oleh pemula;
3. *Simple* namun *powerful*;
4. Multiplatform
5. Populer
6. Portable
7. Modul yang berlimpah
8. Open Source
9. Cepat





Dasar Bahasa Pemrograman Python

Operator Aritmatika

Operator	Deskripsi	Contoh
+	Penjumlahan	$3 + 4$ bernilai 7
-	Pengurangan	$8 - 1$ bernilai 7
*	Perkalian	$1 * 7$ bernilai 7
/	Pembagian	$7 / 1$ bernilai 7
//	Pembagian (dibulatkan kebawah)	$15 // 2$ bernilai 7
%	Sisa Bagi / Modulo	$13 \% 5$ bernilai 3

Operator Assignment

Operator	Deskripsi	Contoh
=	Assignment	$N = 7$
+=	Penjumlahan	$N += 7$, N akan ditambah 7.
-=	Pengurangan	$N -= 7$, N akan dikurangi 7.
*=	Perkalian	$N *= 7$, N akan dikali 7.
//=	Pembagian (dibulatkan kebawah)	$N //= 7$, N akan dibagi 7 (dibulatkan kebawah)
%=	Sisa Bagi / Modulo	$N \% = 7$, N akan dimodulo 7.
=	Assignment	$N = 7$

Operator *Relational*

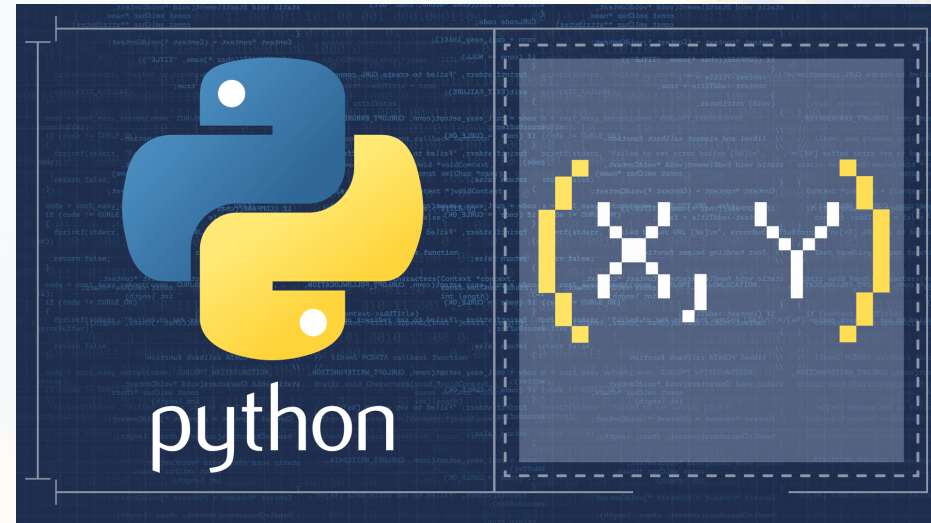
Operator	Deskripsi	Contoh True	Contoh False
==	Sama dengan	$7 == 7$	$2 == 3$
!=	Tidak Sama dengan	$7 != 2$	$3 != 3$
<	Kurang dari	$7 < 8$	$7 < 7$
>	Lebih dari	$8 > 7$	$7 > 8$
<=	Kurang dari sama dengan	$7 <= 7$	$7 <= 8$
>=	Lebih dari sama dengan	$8 >= 7$	$2 >= 4$

Operator Logika

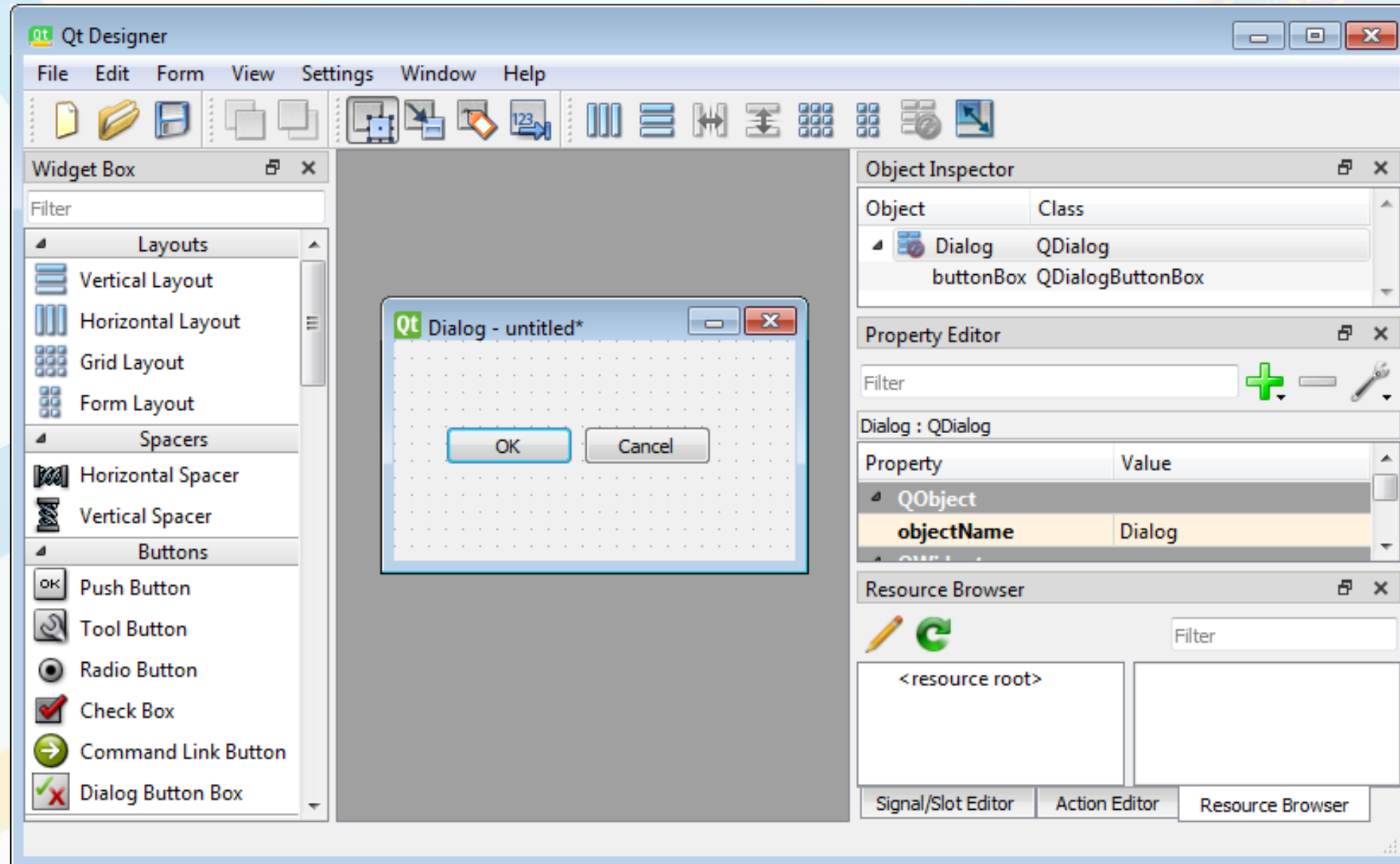
Operator	Deskripsi	Contoh True	Contoh False
and	Dan	$(1 < 2) \text{ and } (3 == 3)$	$(1 == 2) \text{ and } (3 == 3)$
or	Atau	$(1 < 2) \text{ or } (4 == 3)$	$(3 < 2) \text{ or } (2 == 3)$
not	Negasi	$\text{not } (3 < 2)$	$\text{not } (1 > 2)$

Mengenal Tanda Kurung di Python

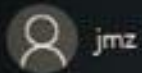
- () tanda kurung bulat untuk data tuple;
- [] tanda kurung kotak untuk data list/daftar;
- { } tanda kurung keriting untuk data *dictionary*;
- ‘ ‘ tanda petik satu untuk data *string*;
- “ “ tanda petik dua untuk data *string*;



Aplikasi Berbasis Desktop



Beyond browsing



jmz

Most used



Alarms & Clock



Calculator



Maps



Sticky Notes



Paint



Notepad



Snipping Tool

Recently added



Email and accounts



File Explorer



Settings



Power



All apps

Life at a glance



Calendar



Mail



Project Spartan



Photos



Search



People



News



OneNote



Store (Beta)



Weather

Play and Explore



Music



Video



Xbox



Money



Sports



Get started



Insider Hub



Windows Feedback

Chart

Top free

Top paid

Best-rated

Top-grossing

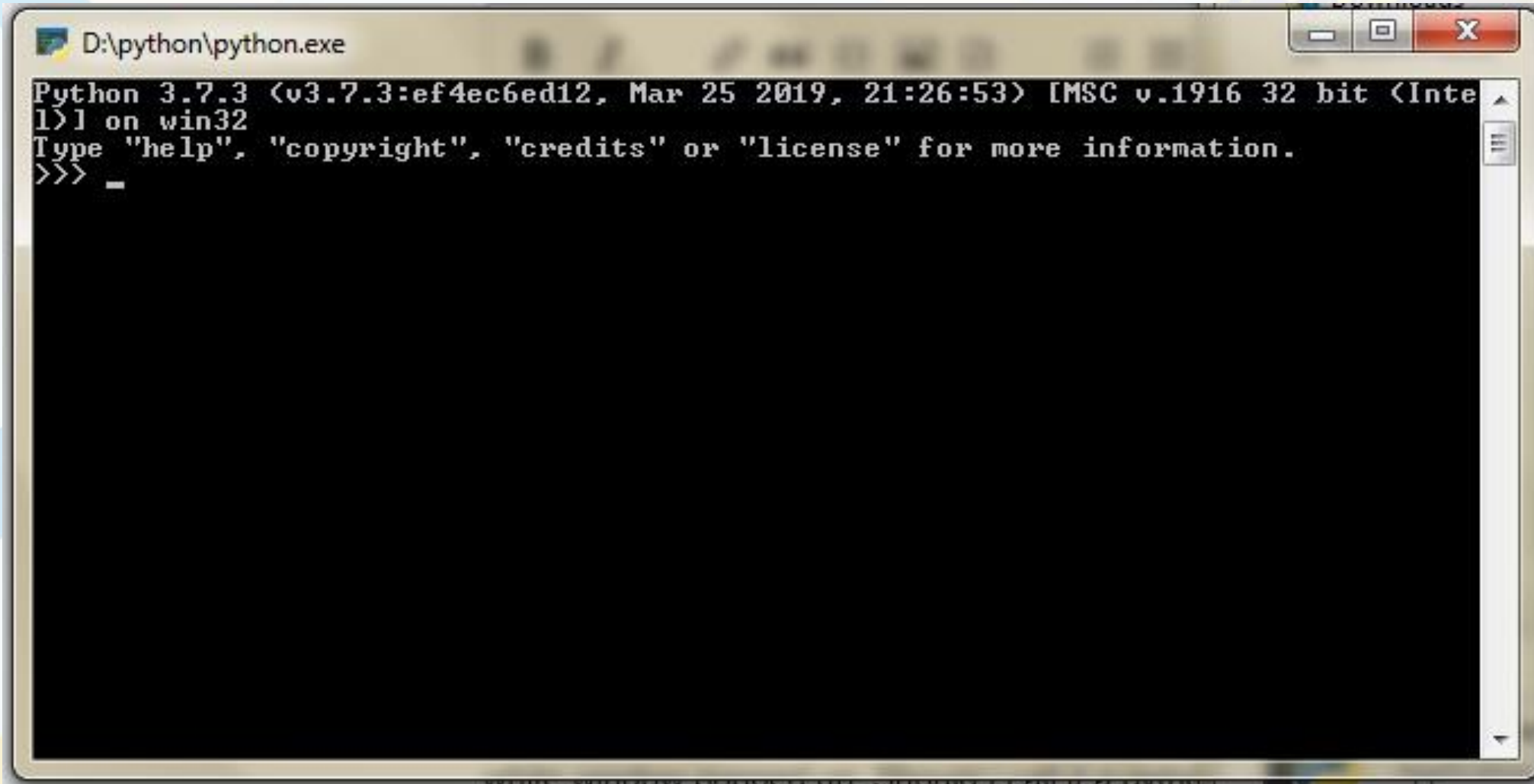
New and rising

... Aplikasi Berbasis Desktop

Education

Entertainment

Aplikasi Berbasis *Command Line*



The image shows a screenshot of a Windows command prompt window titled "D:\python\python.exe". The window displays the following text:

```
Python 3.7.3 (v3.7.3:ef4ec6ed12, Mar 25 2019, 21:26:53) [MSC v.1916 32 bit (Intel)] on win32
Type "help", "copyright", "credits" or "license()" for more information.
>>> _
```



```

~/dev/git/dhamith93/csv-sql  master  ./csvsql
Welcome to CSV-SQL
cmd > LOAD sample.csv user
File has a header row (y/n)?
> y
cmd > LOAD sample_out.csv emp
File has a header row (y/n)?
> y
cmd > SELECT COUNT(*) FROM user
+-----+
| COUNT(*) |
+-----+
|      8 |
+-----+
cmd > SELECT emp.emp_id, emp.name, user.user_name, user.roLe FROM emp INNER JOIN user ON emp.user_id = use
+-----+-----+-----+-----+
| emp_id | name      | user_name | roLe |
+-----+-----+-----+-----+
| d101   | Jack Bauer | test1     | admin |
| d102   | GOB Bluth | test2     | user  |
| d103   | Buster Bluth | test4    | user  |
| d104   | Samurai Jack | test5    | admin |
+-----+-----+-----+-----+
cmd > SELECT * FROM emp WHERE name LIKE 'Jack%'
+-----+-----+-----+
| emp_id | name      | user_id |
+-----+-----+-----+
| d101   | Jack Bauer | 1 |
+-----+-----+-----+
cmd > SELECT * FROM emp
+-----+-----+-----+
| emp_id | name      | user_id |
+-----+-----+-----+
| d101   | Jack Bauer | 1 |
| d102   | GOB Bluth | 2 |
| d103   | Buster Bluth | 4 |
| d104   | Samurai Jack | 5 |
+-----+-----+-----+
cmd > EXIT
~/dev/git/dhamith93/csv-sql  master

```

... Aplikasi Berbasis Command Line

- GUI atau tampilan terbatas atau bahkan tidak menggunakan;
- Fokus pada pemrosesan data, bukan GUI;
- GUI adalah *Graphical User Interface* atau tampilan aplikasi yang dapat diklik-klik oleh mouse;

jupyter covid_19_dashboard Last Checkpoint: Last Friday at 11:45 PM (unsaved changes) ✓

File Edit View Insert Cell Kernel Widgets Help Trusted Python 3 O

```
In [13]: # importing libraries

from __future__ import print_function
from ipywidgets import interact, interactive, fixed, interact_manual
from IPython.core.display import display, HTML

import numpy as np
import pandas as pd
import matplotlib.pyplot as plt
import plotly.express as px
import folium
import plotly.graph_objects as go
import seaborn as sns
import ipywidgets as widgets

In [14]: # loading data right from the source:
death_df = pd.read_csv('https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_data/confirmed_df = pd.read_csv('https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_data/recovered_df = pd.read_csv('https://raw.githubusercontent.com/CSSEGISandData/COVID-19/master/csse_covid_19_data/csse_covid_19_data/country_df = pd.read_csv('https://raw.githubusercontent.com/CSSEGISandData/COVID-19/web-data/data/cases_country.csv')

In [15]: confirmed_df.head()

In [16]: recovered_df.head()

In [17]: death_df.head()

In [18]: country_df.head()
```



**Aplikasi untuk
Mempermudah
Pemrosesan
Data**

Praktik Pemrograman Dasar Python



Praktik menggunakan Google Colab



Buka <https://colab.research.google.com/>



Login menggunakan **Akun Gmail**



python



colab