

**Konsep, Perbedaan Tingkat Rendah
dan Tinggi, Jenis-jenis Bahasa,
Sintaksis, Platform, dan Pemilihan**

Hartono, S.Pd., M.T.I

Universitas Muhammadiyah Kotabumi

Masuk Program Studi STI nanti bisa menjadi apa saja?

- Programmer
- Data Scientist
- Web Desainer





Definisi Programmer

Pemrogram atau disebut juga ahli penataolahan adalah profesi yang menulis program perangkat lunak menggunakan bahasa pemrograman seperti Perl, C++, C#, JavaScript, Python, VB, Visual Basic .NET, PHP, dan lain-lain.

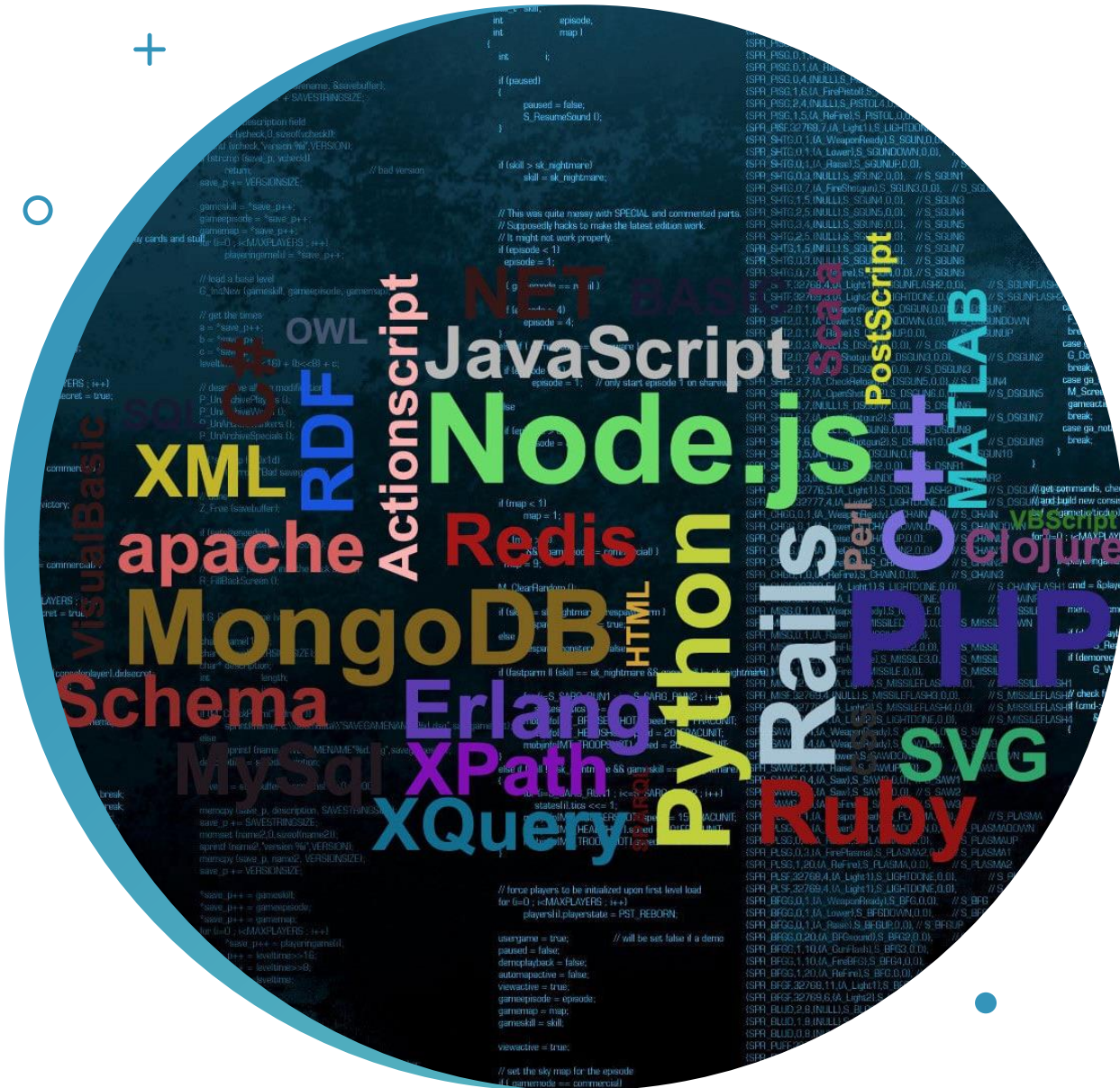


Definisi Bahasa Pemrograman

- Bahasa pemrograman adalah sekumpulan instruksi yang diberikan kepada komputer untuk dapat melaksanakan tugas-tugas tertentu dalam menyelesaikan suatu permasalahan.
- Bahasa pemrograman berfungsi untuk memerintah komputer agar dapat mengolah data sesuai dengan langkah-langkah penyelesaian yang telah ditentukan oleh programmer.

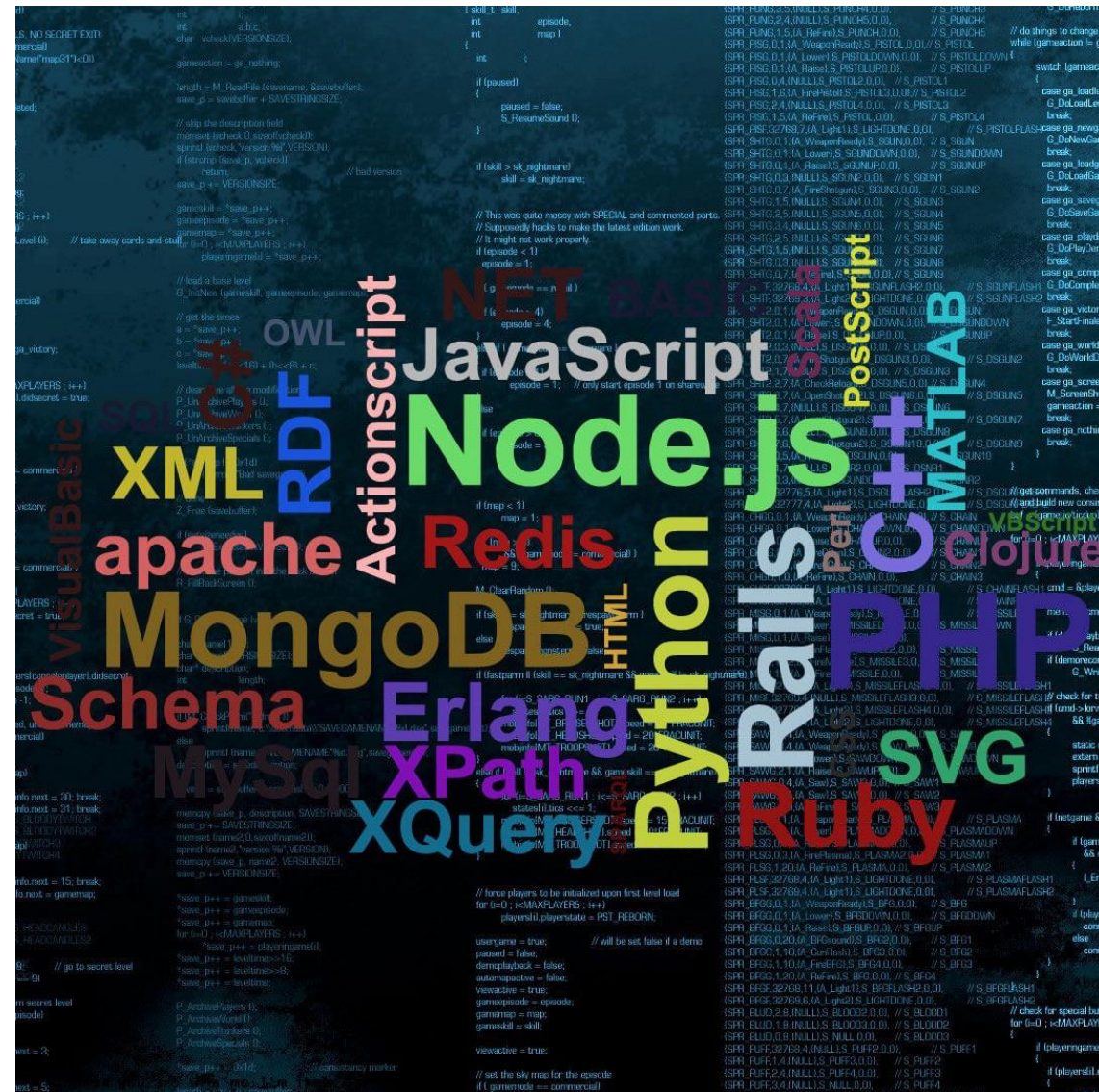
Jenis-Jenis Tingkatan Bahasa Pemrograman

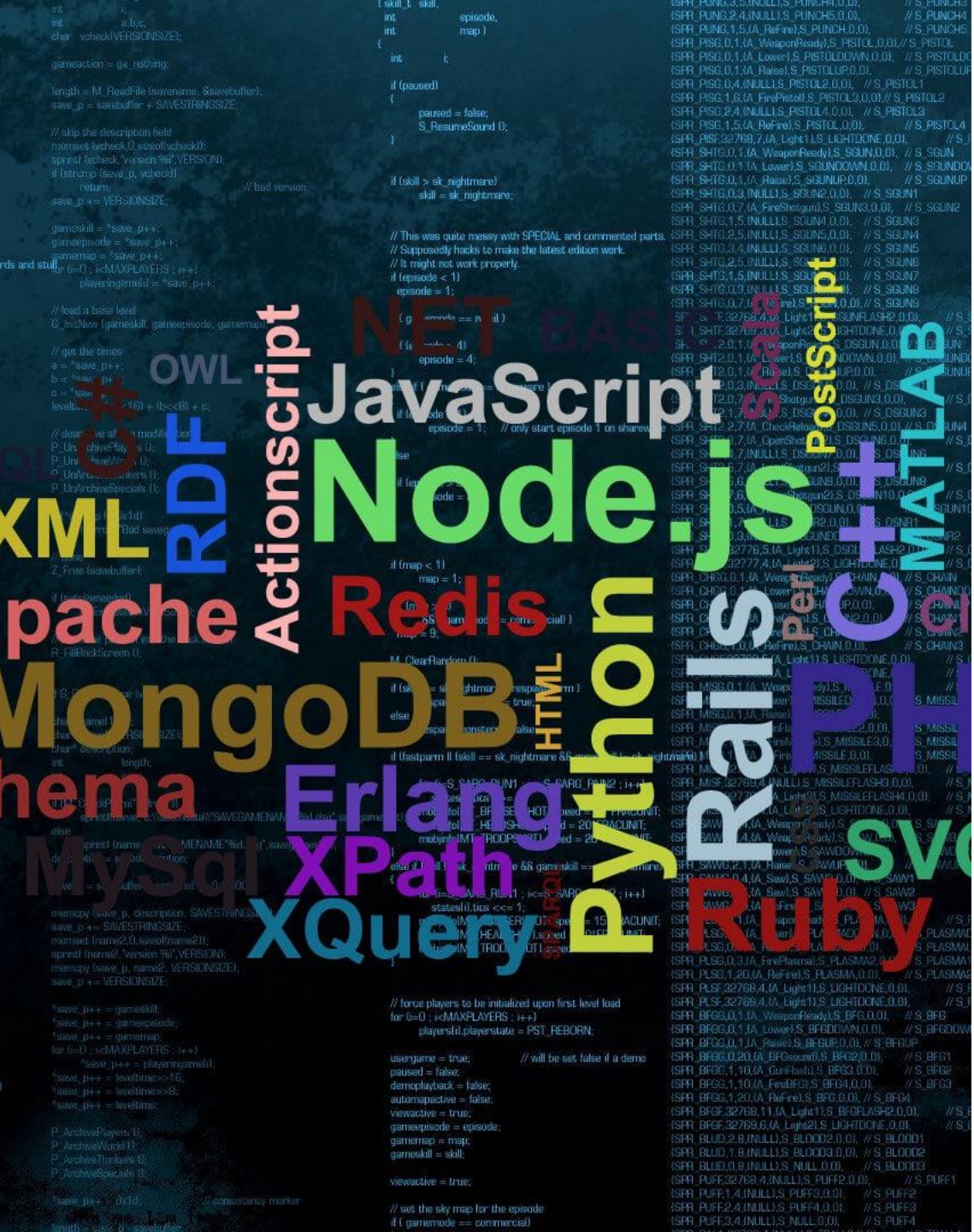
- **Bahasa Pemrograman Tingkat Rendah (Low-Level Programming Language):** Bahasa ini lebih dekat dengan bahasa mesin dan perangkat keras komputer. Instruksi dalam bahasa ini sangat spesifik dan terkait erat dengan operasi perangkat keras.
- **Bahasa Pemrograman Tingkat Menengah (Intermediate-Level Programming Language):** Bahasa ini berada di antara bahasa tingkat rendah dan tinggi dalam hal abstraksi. Ini adalah bahasa yang mencoba menggabungkan beberapa fitur dari kedua tingkat tersebut.
- **Tinggi (High-Level Programming Language):** Bahasa ini lebih terabstraksi dari bahasa mesin dan perangkat keras. Instruksi dalam bahasa ini lebih fokus pada algoritma, logika pemrograman, dan solusi masalah.



Bahasa Pemrograman Tingkat Rendah

- Bahasa ini lebih dekat dengan bahasa mesin dan perangkat keras.
- Instruksi dalam bahasa ini sangat spesifik dan terkait erat dengan operasi perangkat keras.
- Contoh bahasa ini adalah bahasa rakitan (assembly language) dan bahasa mesin.
- Memberikan kontrol yang sangat mendalam atas perangkat keras, namun kompleksitasnya membuatnya sulit dimengerti oleh manusia.





Bahasa Pemrograman Tingkat Menengah

- Berada di antara tingkat rendah dan tinggi dalam hal abstraksi.
- Mencoba menggabungkan beberapa fitur dari kedua tingkatan tersebut.
- Contoh bahasa ini adalah C, yang menggabungkan elemen tingkat rendah seperti manipulasi memori dengan fitur tingkat tinggi seperti pengelolaan tipe data.

Bahasa Pemrograman Tingkat Tinggi

- Lebih terabstraksi dari bahasa mesin dan perangkat keras.
- Instruksi dalam bahasa ini lebih fokus pada algoritma, logika pemrograman, dan solusi masalah.
- Bahasa tingkat tinggi lebih mudah digunakan dan lebih mudah dimengerti oleh manusia.
- Contoh bahasa ini meliputi Python, Java, C++, dan banyak lagi, yang memungkinkan fokus pada pemecahan masalah daripada detail perangkat keras.



Jenis-Jenis Bahasa Pemrograman

How programming languages got their names

 @TheStrangeRoots



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-iksir' 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 'gan' (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.



Clojure

The creator wanted to include the letter 'c' (C#), 'l' (Lisp) and 'j' (Java) and liked that it was a pun on 'closure'. The word 'closure', the act of closing, comes from the Latin 'clausura' stemming from 'claudere' which means 'to shut or close'.



Java

The name Java was the result of a highly-caffeinated brainstorming session. Java, or 'Jawa' in Indonesian, is the name of a large island in Indonesia that produces strong, dark and sweet coffee. It has been a slang term for coffee in the United States since the 1800s.



Perl

Initially named Pearl, the alternative spelling was adopted as the name was already taken. It comes from the Middle French 'perle' meaning 'bead' or 'something valuable' and the Latin 'perna' meaning 'leg', also a mollusc shaped like a leg of mutton.



R

R is named partly after the first names of the first two R authors (Ross Ihaka and Robert Gentleman) and partly as a play on the name of S. itss parent language. It is the 18th letter in the alphabet and derives from the Greek letter 'Rho'.



Scala

Scala is a combination of the first letters of 'scalable' and 'language'. It is also the Italian word for 'stairway', as it helps users to ascend to a better language. The logo is also an abstraction of a staircase or steps.

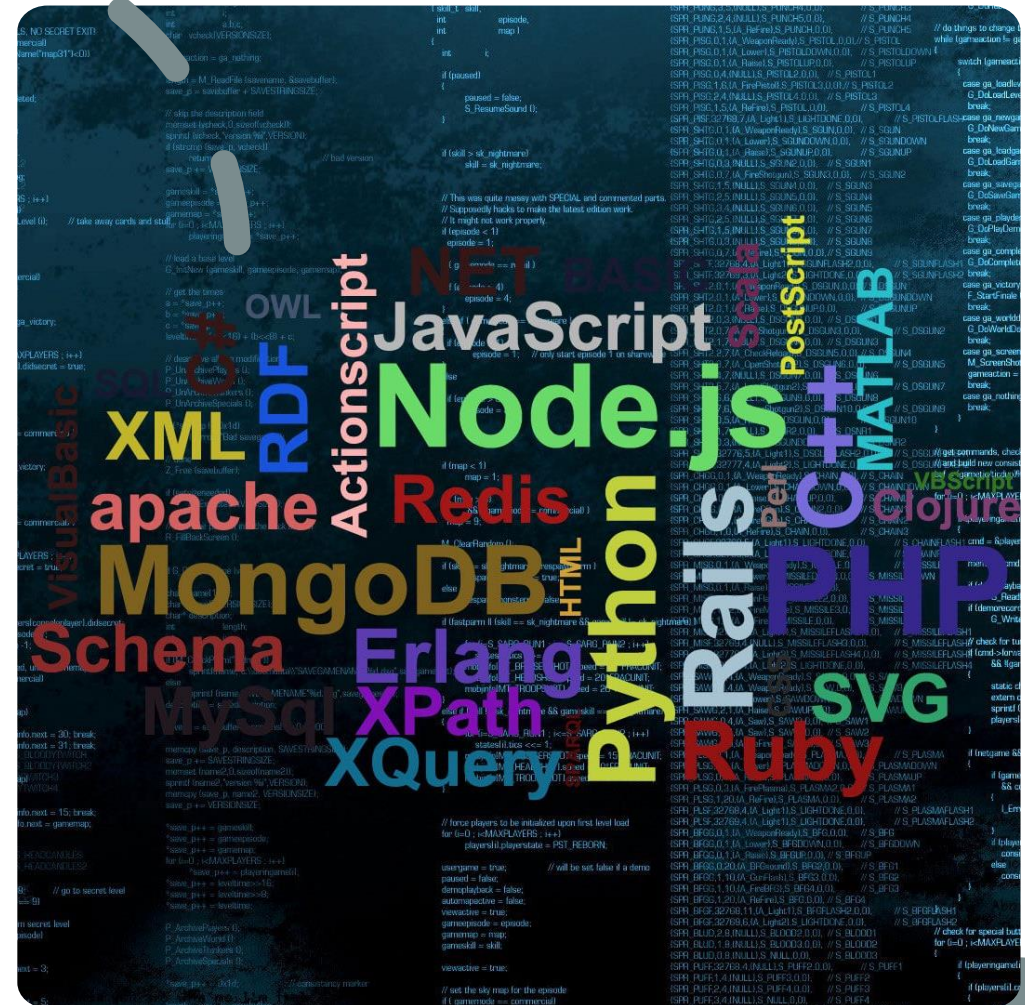


TypeScript

Originating from the shortcomings of JavaScript, hence the similarity of the name. Its name combines 'Type', meaning a kind or class (from the Greek 'tuptein' 'to strike'), with 'Script', 'something that is written' from the Latin 'scriptum'.

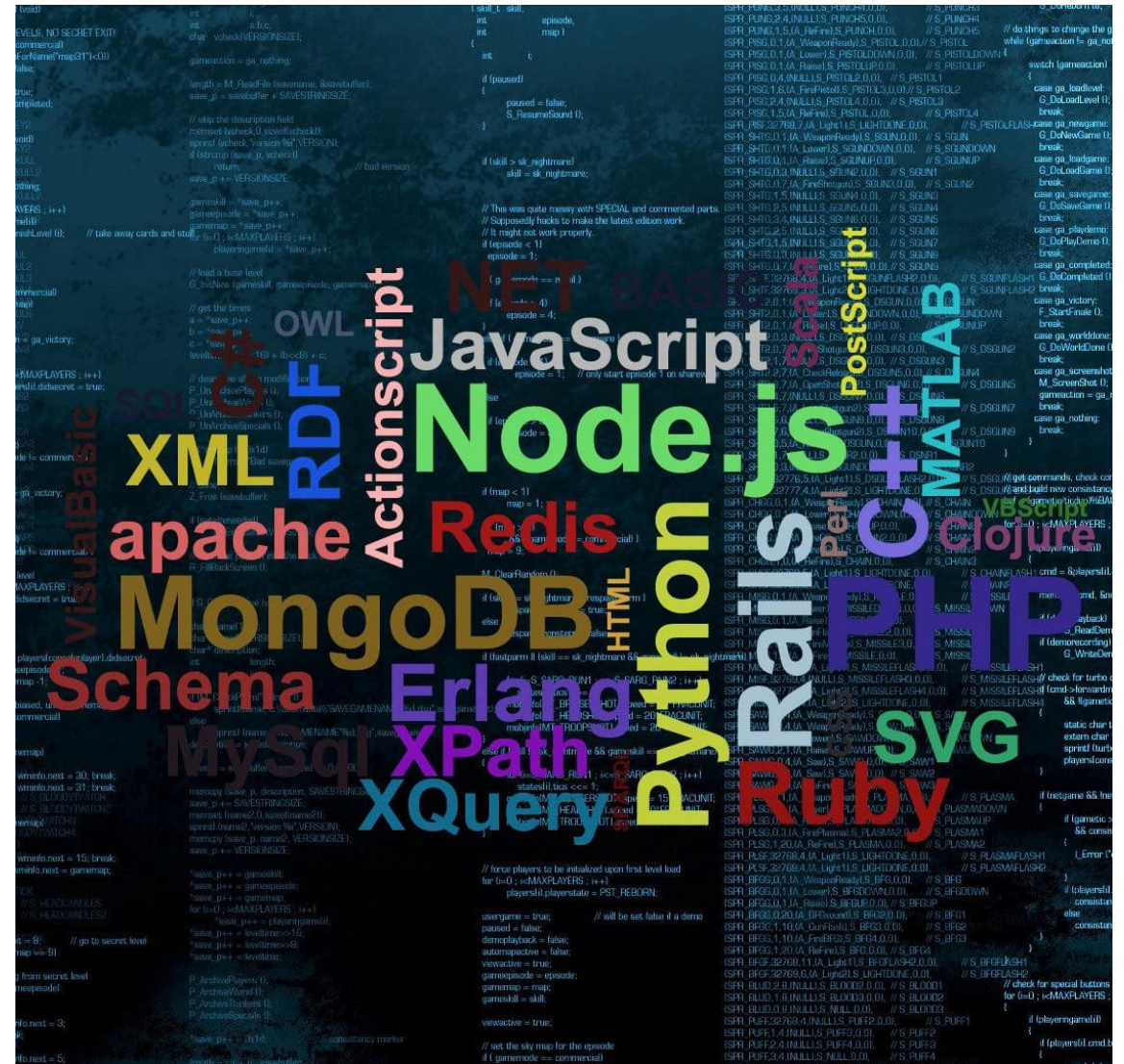
Pengembangan Aplikasi Berbasis Website

- C++
- Java
- C#
- Python
- Ruby
- Swift (untuk aplikasi macOS)



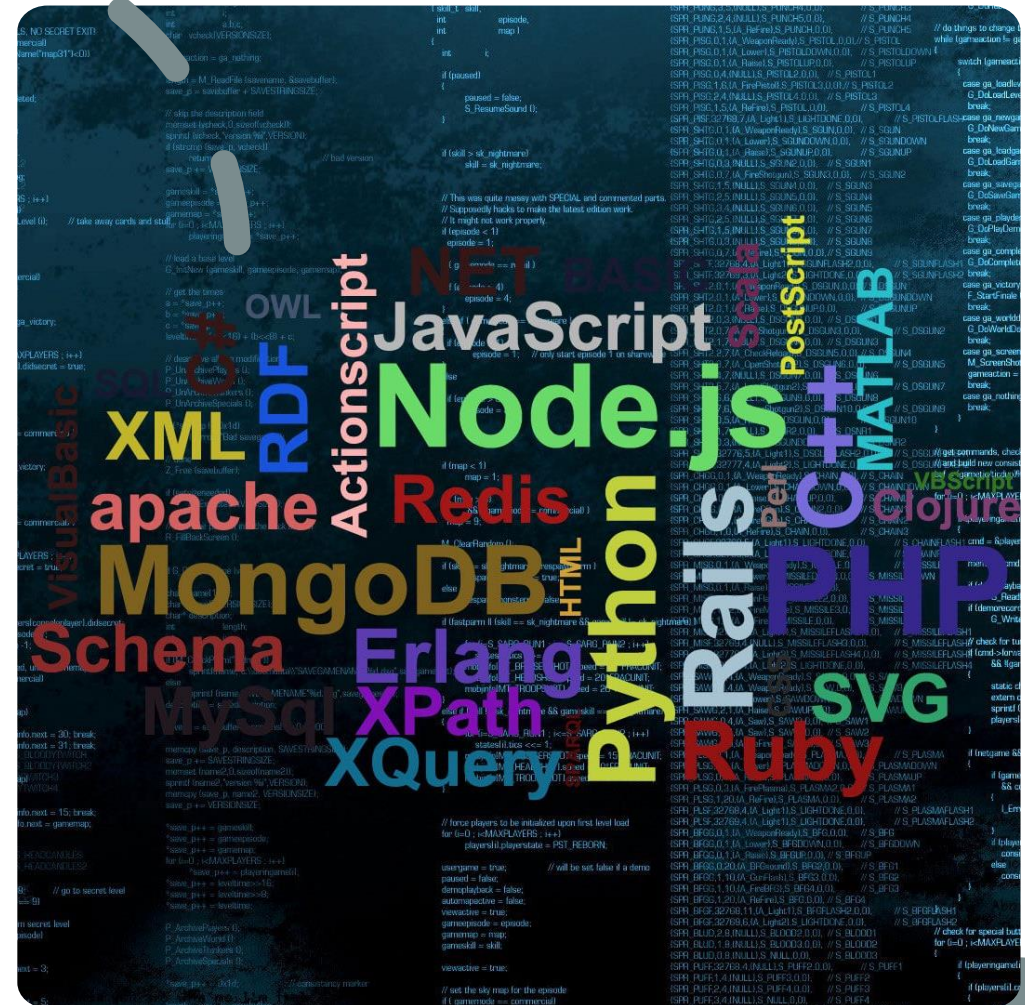
Platform Bahasa Pemrograman Berdasarkan Jenis Pengembangan

- HTML/CSS
- JavaScript
- PHP
- Python (Django, Flask)
- Ruby (Ruby on Rails)
- Java (Spring Boot)
- ASP.NET (C#)
- Go (Golang)
- TypeScript













Pengembangan Aplikasi Mobile







- Java
- Kotlin
- Swift
- Objective-C



Bahasa Pemrograman Populer

Aug 2023	Aug 2022	Change	Programming Language		Ratings
1	1			Python	13.33%
2	2			C	11.41%
3	4	↑		C++	10.63%
4	3	↓		Java	10.33%
5	5			C#	7.04%
6	8	↑		JavaScript	3.29%
7	6	↓		Visual Basic	2.63%
8	9	↑		SQL	1.53%
9	7	↓		Assembly language	1.34%
10	10			PHP	1.27%

Bahasa Pemrograman Populer

11	21	⬆️		Scratch
12	15	⬆️		Go
13	17	⬆️		MATLAB
14	18	⬆️		Fortran
15	31	⬆️		COBOL
16	16			R
17	19	⬆️		Ruby
18	11	⬇️		Swift
19	22	⬆️		Rust
20	28	⬆️		Julia

Syntax Bahasa Pemrograman

Syntax adalah sebuah aturan yang digunakan untuk menulis kalimat agar mampu dimengerti oleh 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%
```

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.



Bahasa Pemrograman C



```
#include <stdio.h>

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

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

Bahasa Pemograman Java

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



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.



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.

```
#include <iostream>

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


Bahasa Pemrograman Visual Basic



```
Imports System

Module Module1
    Sub Main()
        Console.WriteLine("Hello World!")
        Console.WriteLine("Press Enter Key to Exit.")
        Console.ReadLine()
    End Sub
End Module
```

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

Bahasa Pemrograman 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”



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

Bahasa Pemograman

Go

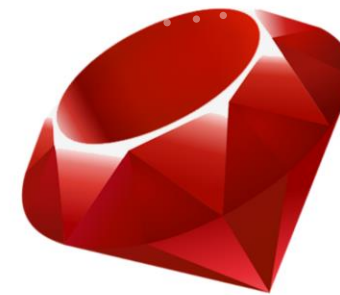


```
println("Hello World");
```

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

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.



Ruby
Programming

```
puts 'Hello World'
```

Bahasa Pemrograman 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")
```


Pertimbangan Memilih Bahasa Pemrograman

1. Kebutuhan Proyek
2. Performa dan Efisiensi
3. Komunitas dan Dukungan
4. Pustakan dan Kerangka Kerja
5. Ketersediaan Sumber Daya



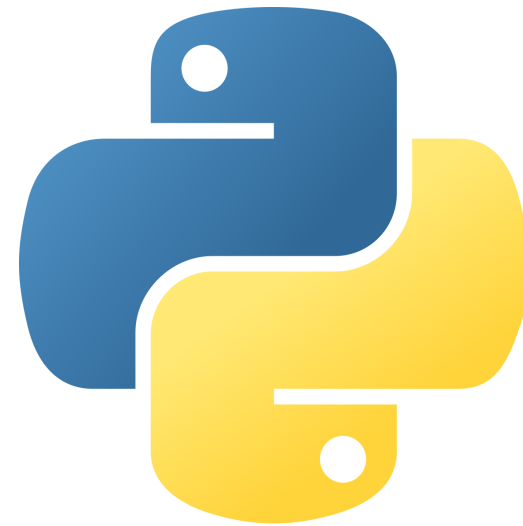


Pertimbangan Memilih Bahasa Pemrograman

6. Multi Platform
7. Tingkat Kebutuhan UI/UX
8. Dampak Komersial
9. Ketersediaan Pengembang
10. Tren dan Masa Depan
11. Kemampuan

Mengapa Memilih Python?

- Bahasa/syntax mudah dipahami;
- Mudah dipelajari oleh pemula;
- *Simple* namun *powerful*;
- Multiplatform
- Komunitas Besar
- Portable
- Modul yang berlimpah
- Open Source
- Pondasi dasar pemrograman OOP



Aplikasi yang Diperlukan



Python

<https://www.python.org/downloads/>



Python Anaconda (alternatif)

<https://www.anaconda.com/products/distribution>



Google Colab (alternatif)

<https://colab.google.com>



Visual Studio Code

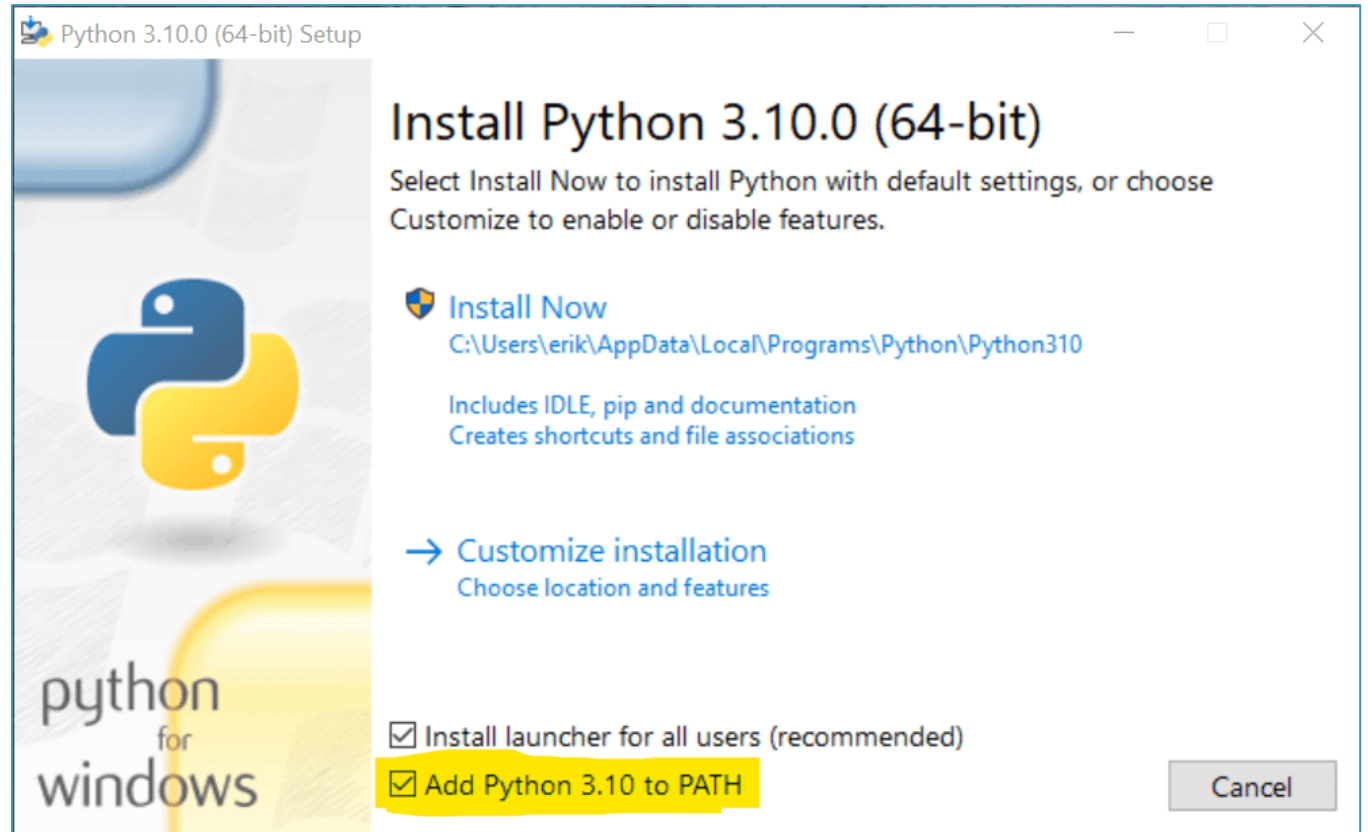
<https://code.visualstudio.com/>



PyDroid3 (Android)



Python on Windows



```
PowerShell
PS C:\Users\FBA_Desktop> python --version
Python 3.10.2
PS C:\Users\FBA_Desktop> |
```



Python on Windows



19
20
21
22
23
24
25
26
27
28
29
30

```
def parse_content(url) -> BeautifulSoup:
    response: Response = httpx.get(url)
    parsed_content: BeautifulSoup = bs(response.content, features="html.parser")
    clean_raw_content: BeautifulSoup = parsed_content
    return clean_raw_content
```

```
def generate_wordcloud(content, mask=None) -> WordCloud:
    stopwords: set[str] = STOPWORDS / {"see", "use", "using", "tutorial", "Node", "js", "f
    wc: WordCloud = WordCloud(
        background_color="black",
```

```
        max_words=2000,
        mask=mask,
        width=10,
        contour_color="white",
        stopwords=stopwords,
```

```
    return wc.generate(content)
```

**Visual Studio Code
(VSCoDe)**



Mengapa Menggunakan Visual Studio Code?

1. Ringan & Responsif
2. Lintas Platform
3. Ekstensibilitas Kuat
4. Integrasi Git
5. Debugging Terpadu
6. Intellisense & Auto-Completion
7. Tata Letak Fleksibel
8. Terminal Terpadu
9. Pengeditan Kolaboratif
10. Dukungan Bahasa Luas
11. Sumber Terbuka & Gratis