

Title: Python vs. Java: A Comparative Overview
Subtitle: Characteristics, Use Cases, and Advantages
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INTRODUCTION

TITLE: OVERVIEW

01

BRIEF INTRODUCTION TO
PROGRAMMING LANGUAGES

02

PURPOSE OF COMPARISON:
UNDERSTAND DIFFERENCES AND
USE CASES

03

OUTLINE OF TOPICS COVERED:
CHARACTERISTICS, USE CASES,
ADVANTAGES

PYTHON OVERVIEW



- **Description:** Python is a high-level, dynamically typed and interpreted programming language.
- **Released:** It was developed by Guido van Rossum in 1989 and released in 1991.
- **Key Features:** It has concise syntax and open-source nature which promotes readability and implementation of programs. In addition, it has extensive libraries.
- **Example code;**

```
print ('Good Morning')
```



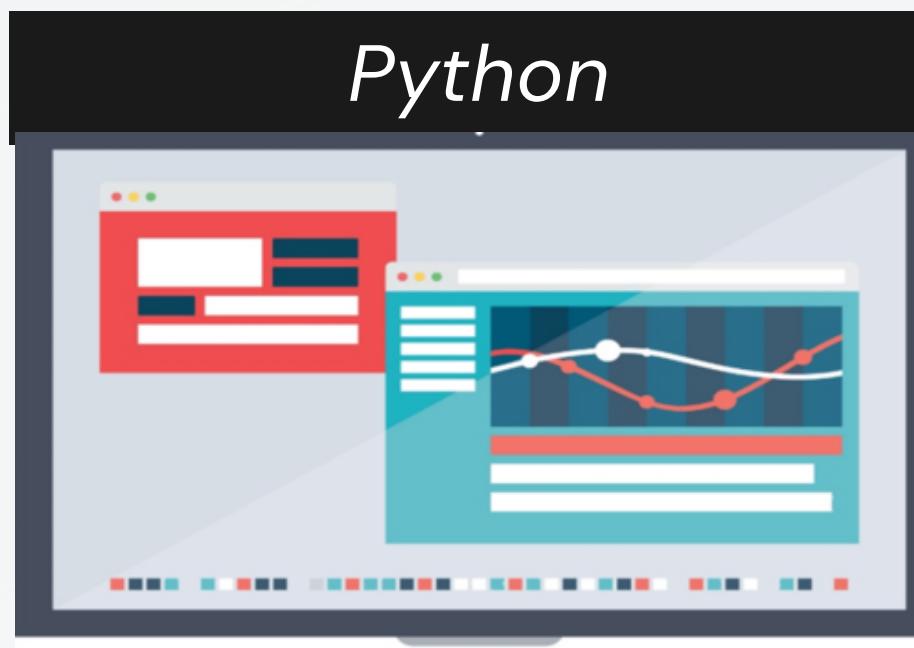
JAVA OVERVIEW

- **Description:** JAVA is a high-level, compiled, statically-typed programming language.
- **Released:** It was developed by James Gosling and released by Sun Microsystems in 1995
- **Key Features:** It is object-oriented thus helping to organize code through the concept of objects, classes and inheritance. In addition, it is platform independent and has strong memory management since it has a garbage collector.
- **Example code**

```
public class Good Morning {  
public static void main(String[] args) {  
    System.out.println('Good, Morning!');  
}
```

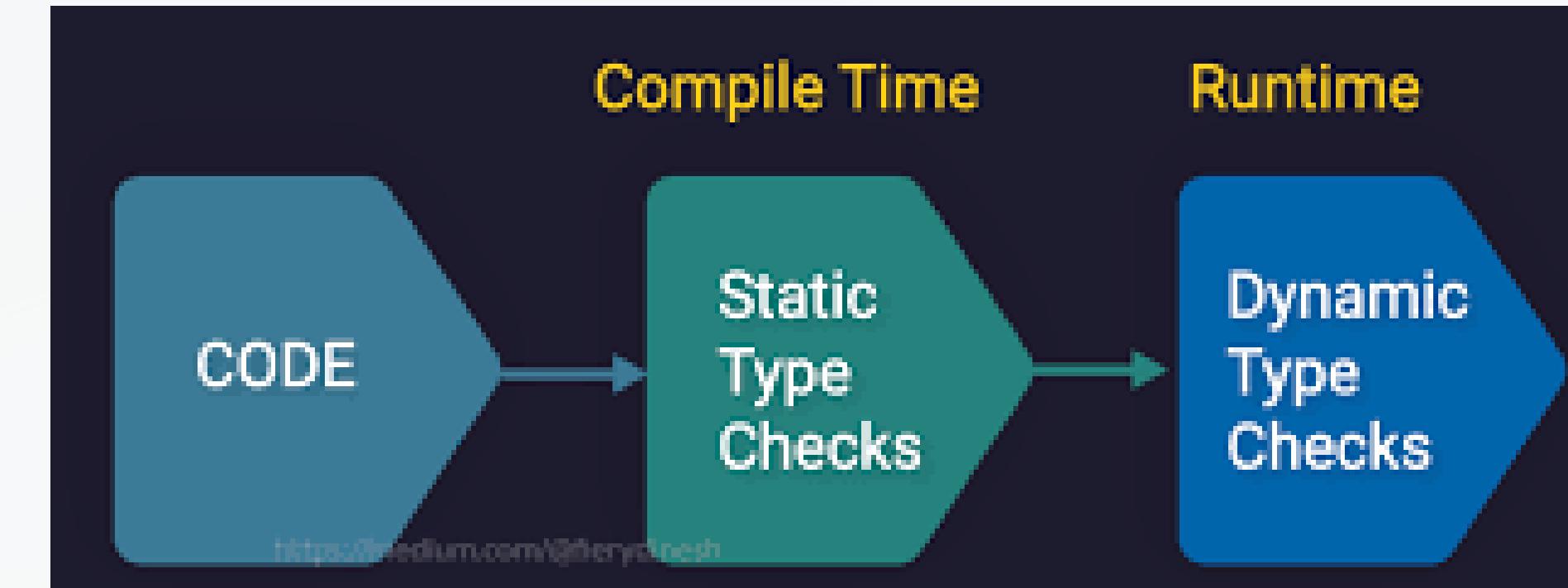


LANGUAGE CHARACTERISTICS



- **Syntax:** Simple and readable making Python a popular choice for beginners as well as experienced developers.
- **Typing:** Dynamically typed thus the programmer doesn't have to specify variable types every time.
- **Compilation:** Interpreted meaning the source code is not directly translated by the machine.

- **Memory Management:** Automatic garbage collection because it has a garbage collector



LANGUAGE CHARACTERISTICS



- **Syntax:** Verbose and strict meaning more words are used to convey information.
- **Typing:** Statically typed meaning the programmer must specify what type each variable is.
- **Compilation:** Compiled to bytecode, runs on JVM. This means that the target machine directly translates the program

- **Memory Management:** Automatic garbage collection because it has a garbage collector thus reducing the chances of memory leaks.

Dynamic vs. Static Typing

```
s = "foo";
n = s.length();
i
```

dynamically typed

```
String s = "foo";
int n = s.length();
i
```

statically typed

- flexible
- unexpected run-time errors

- reliable
- tedious to write type annotations

USE CASES- PYTHON

01

WEB DEVELOPMENT

The frameworks it uses such as Django and Flask make it a popular choice for building web applications. Examples include Instagram and Pinterest.

02

DATA SCIENCE & MACHINE LEARNING

It is widely used for data analysis, visualization, and building machine learning models due to the vast libraries like NumPy and Pandas.

03

AUTOMATION AND SCRIPTING

It is often used for writing scripts to automate repetitive tasks such as file management, web scraping and data processing.

04

GAME DEVELOPMENT

Due to the vast libraries like Pygame, Python can be used to create 2D and 3D games.

USE CASES- JAVA

01

ENTERPRISE APPLICATIONS

It is heavily used in building large-scale, high-performance enterprise applications using frameworks like Spring and Hibernate.

02

MOBILE DEVELOPMENT

It is the primary language for building Android applications. These include Whatsapp, Spotify and Uber

03

LARGE-SCALE SYSTEMS

It is frequently used in big data applications due to frameworks like Apache Spark

04

CLOUD-BASED APPLICATIONS

It is often used for building distributed, cloud-based applications, especially with the help of cloud platforms like Google cloud.



Python Applications

Audio or
Video-Based
Applications

Business
Applications

scientific
&
numeric

Software
Development

3D CAD
Applications

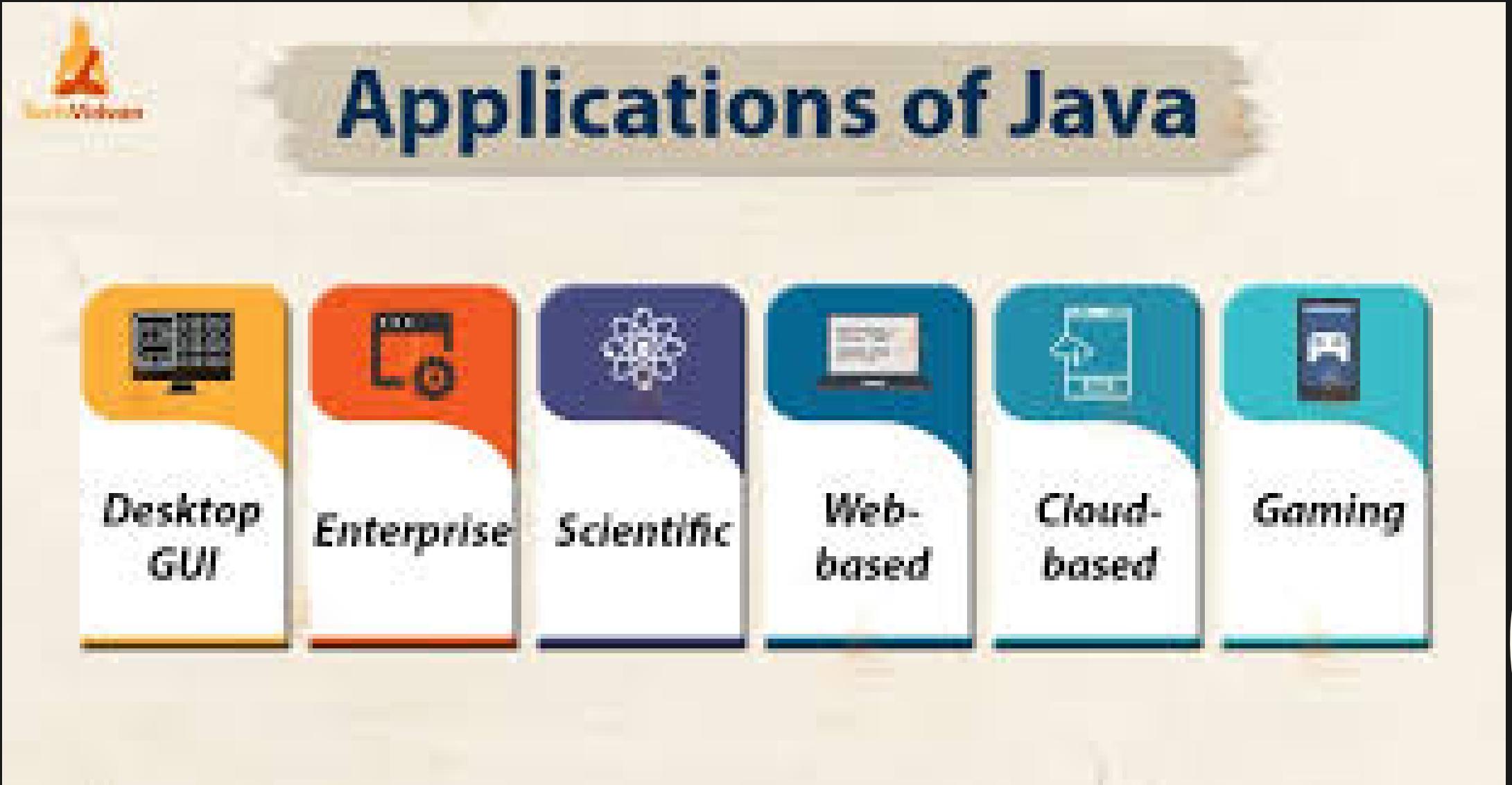
Enterprise
Applications

Image
Processing
Applications

Web
applications

Desktop GUI
Applications

Console-
Based
Applications



ADVANTAGES OF PYTHON



Ease of Learning
because of the simple
syntax.

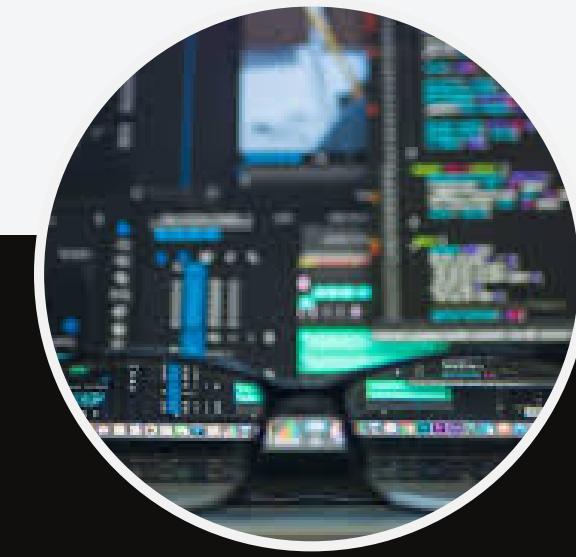


Rapid
Development; has
the ability to
quickly create and
iterate on
prototypes



Extensive Libraries. it
has vast libraries like
Numpy

ADVANTAGES OF JAVA



Performance; It has High performance due to bytecode and JVM optimizations



Platform Independence; Write Once, Run Anywhere (WORA)



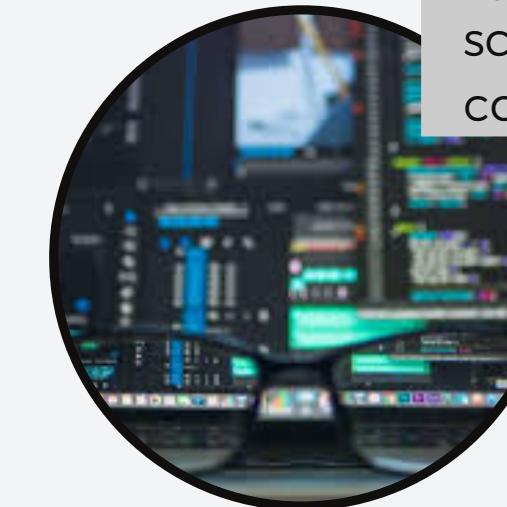
Strong Typing; promotes reduced runtime errors

SUMMARY

Python is ideal for quick development, automation, data science, machine learning, AI, and web development. However, it is generally slower due to interpreted nature.



Java is favored for large-scale enterprise systems, Android apps, cloud computing, and applications requiring high performance and scalability. In performance, it is faster due to compilation and JVM optimizations.



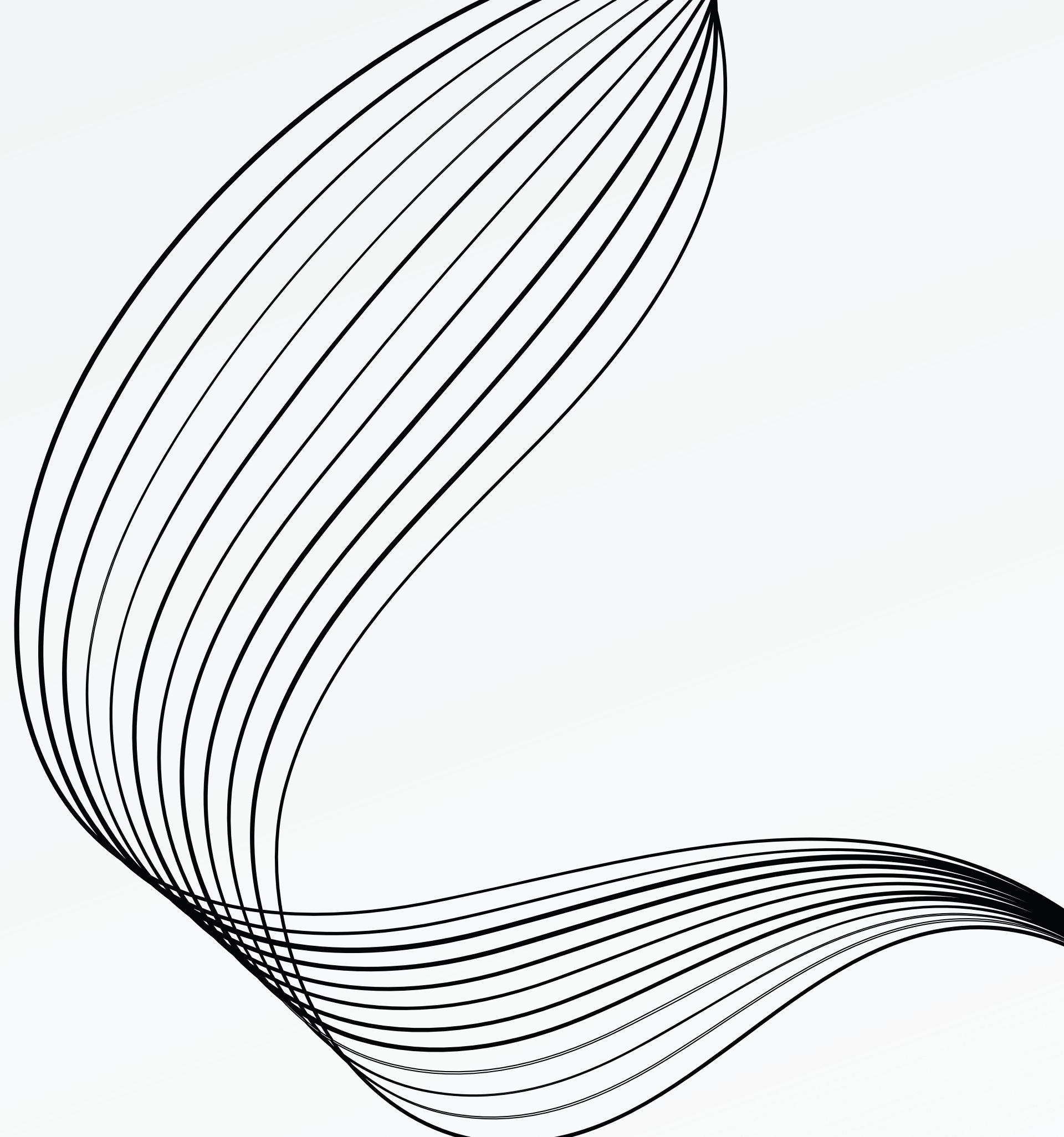
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Python.org

Oracle Java



THANK YOU!

