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UDC 004.432
IRSTI 50.05.09

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PYTHON IS A HIGH-LEVEL PROGRAMMING LANGUAGE

ANNOTATION
Python is one of the programming languages that is widely used on different platforms and is also easy to learn. This article discusses a brief history of the creation of Python, where this programming language is used, its features and advantages and disadvantages. The areas of application of the language and about popular programs, games, and applications that currently use the Python language will also be considered. This article will help to increase students' interest in programming.

Key words: Python programming language, web development, data analysis, code.

Introduction. IT professionals are always looking for a cross-platform, free, easy-to-learn language, with excellent support from the developer community and good built-in features that could help us develop our applications quickly. If you ask yourself, does such a language exist? The answer is "Yes", and that's Python.

Python is one of the most popular general-purpose programming languages. It is among the fastest growing programming languages in the world and is used by software engineers, mathematicians, data analysts, scientists, network engineers, students and accountants. Consider the functions that make Python such a powerful language.

It is an interpreted, object-oriented and high-level programming language. Python is called an interpreted language because its source code is compiled into bytecode, which is then interpreted. CPython usually compiles Python code into bytecode before interpreting it.

It supports dynamic typing and dynamic binding. In languages such as Java, C and C++, you cannot initialize the string value of an int variable, and in such cases the program will not compile. Python doesn't know the type of the variable until the code is executed.

According to statistics on the use of the programming language for 2022, Python leads the ranking of the most popular programming languages.

Dec 2022	Dec 2021	Change		Programming Language	Ratings	Change
1	1			Python	16.66%	+3.76%
2	2			C	16.56%	+4.77%
3	4	^		C++	11.94%	+4.21%
4	3	v		Java	11.82%	+1.70%
5	5			C#	4.92%	-1.48%
6	6			Visual Basic	3.94%	-1.46%
7	7			JavaScript	3.19%	+0.90%
8	9	^		SQL	2.22%	+0.43%
9	8	v		Assembly language	1.87%	-0.38%
10	12	^		PHP	1.62%	+0.12%

Figura 1 – Rating of programming languages for December 2022 Source: tiobe.com

Python has a simple syntax that improves readability and reduces code maintenance costs. The code looks clear and short.

```
a = 2
b = 3
sum = a + b
print(sum)
```

The Python framework contains modules and packages, which facilitates code reuse.

Python is open source and freely distributed. You can download it for free and use it in your application. You can also read and modify the source code. No code compilation – the editing-testing-debugging cycle is fast, which gives pleasure to any programmer. Supports exception handling. Any code is error-prone. Python generates exceptions that can be handled, hence avoiding program crashes.

Automatic memory management. Memory management in Python includes a private heap (a data structure representing a queue) containing all Python objects and data structures. On demand, the Python Memory Manager allocates heap space for Python objects and other internal buffers. Management of this private heap is provided by Python's internal memory manager.

Using Python. So where is Python used that it is one of the top three popular programming languages in the world? It is most often used in web development, data analysis, machine learning, artificial intelligence and process automation. To create web development, Python frameworks are used (a blank, a ready-made model in IT for rapid development, on the basis of which you can add your own code).

Web Development. As a web developer, you have the opportunity to choose from a wide range of web frameworks that use Python as a server-side programming language. Both Django and Flask are popular among Python programmers. Django is a full-stack Python web framework for developing complex large web applications, while Flask is a lightweight and extensible Python web framework for creating simple web applications, as it is easy to learn and more Python-based. This is a good start for beginners.

Application giants such as Youtube, Spotify, Mozilla, Dropbox, Instagram use the Django framework.

While Airbnb, Netflix, Uber, Samsung use the Flask framework.

Machine learning.

Since Python is a very accessible language, we have a lot of great libraries on top of it that make your work easier. A large number of existing Python libraries will help you focus on more interesting things than reinventing the wheel. Python is also an excellent wrapper language for working with more efficient implementations of C/C++ and CUDA/cuDNN algorithms, so existing machine learning and deep learning libraries work effectively in Python. It is also very important for working in the field of machine learning and artificial intelligence

Data analysis. Python has tools for almost all aspects of scientific computing. Bank of America uses Python to process its financial data, and Facebook uses the Python Pandas library to analyze the data. Although there are many libraries available for Python data analysis, here are a few to get you started: NumPy for scientific computing using Python NumPy is fundamental. It supports large multidimensional arrays and matrices and includes a set of high-level mathematical functions for working with these arrays. SciPy works with NumPy arrays and provides efficient numerical integration and optimization procedures. Pandas, also built on top of NumPy, offers data structures

and operations for working with numeric tables and time series. Matplotlib is a 2D graph library that can create data visualizations in the form of histograms, power spectra, histograms, and scatter plots with just a few lines of code.

Games.

Python and Pygame are good languages and frameworks for quickly prototyping games or for beginners who are learning how to create simple games. Disney's famous multiplayer online role-playing game Toontown Online is written in Python and uses Panda 3D for graphics. Battlefield 2 is a first-person military shooter simulation video game that uses Python for all of its add-ons and many features. Frets on Fire is a free Finnish open source music video game written in Python and using Pygame. Pygame is a free and open source python programming language library for creating multimedia applications such as games.

Desktop applications.

As part of the Python standard library, Tkinter provides you with the ability to create small, simple GUI applications. The PyQt library is most useful for creating python bindings for the desktop for the Qt application development platform (based on C++). The PySide library is a python binding to a cross-platform Qt toolkit with a graphical interface.

How to install Python.

Installing Python is pretty simple. You can install it on any operating system such as Windows, Mac OS, Linux.

Installing Python on Windows.

Go to https://www.python.org/downloads Click "Download Python", versions can be updated every year.

As soon as the python file .exe after downloading, you can run the executable file to install Python. The installation includes IDLE, pip and documentation. IDLE is an integrated development environment (IDE) for Python that comes bundled with the default language implementation. IDLE is a graphical user interface (GUI) that has a number of functions for developing your programs. In the same way Python can be installed on Linux/Unix, Mac OS X. You can also install Pycharm, an IDE for Python developed by JetBrains, it claims to work better than any other IDE for Python. Pycharm helps developers write neat and maintainable code, and also provides all the tools needed for productive Python development. Now that you have the necessary IDE setup, you can start writing your first program. If you are using Pycharm, follow these steps: Click "Create a New Project" on the PyCharm welcome screen.

Pygame. Pygame is a free and open source python programming language library for creating multimedia applications such as games. Desktop applications. As part of the Python standard library, Tkinter provides you with the ability to create small, simple GUI applications. The PyQt library is most useful for creating python bindings for the desktop for the Qt application development platform (based on C++). The PySide library is a python binding to a cross-platform Qt toolkit with a graphical interface. How to install Python. Installing Python is pretty simple. You can install it on any operating system such as Windows, Mac OS, Linux. Installing Python on Windows. Go to https://www.python.org/downloads Click "Download Python", versions can be updated every year. As soon as the python file .exe after downloading, you can run the executable file to install Python. The installation includes IDLE, pip and documentation. IDLE is an integrated development environment (IDE) for Python that comes bundled with the default language implementation. IDLE is a graphical user interface (GUI) that has a number of functions for developing your programs. In the same way Python can be installed on Linux/Unix, Mac OS X. You can also install Pycharm, an IDE for Python developed by JetBrains, it claims to work better than any other IDE for Python. Pycharm helps developers write neat and maintainable code, and also provides all the tools needed for productive Python development. Now that you have the necessary IDE setup, you can start writing your first program. If you are using Pycharm, follow these steps: Click "Create a New Project" on the PyCharm welcome screen.

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РЕЗЮМЕ

Python-является одним из языков программирования, который широко используется на разных платформах а так же прост в изучении. В данной статье рассмотрена краткая история создания Python,где используется этот язык программирования, особенности и его преимущество и недостатки. Также будут рассмотрены области применения языка и о популярных программах, играх, и приложениях, которые в настоящее время используют язык Python. Данная статья поможет повысить интерес учащихся к программированию.

УДК 378.14
ГРНТИ 14.35.09

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