Kapiton A. M., d.p.s., professor,
Goncharov I. K., education seeker
National University «Yuri Kondratyuk Poltava Polytechnic», Ukraine
Scientific lyceum №3 of Poltava city council, Ukraine

AN INTERPRETED PYTHON LANGUAGE WITH DISTINCTIVE DYNAMIC TYPING

The Python language is most often used to work with machine learning, neural networks and artificial intelligence. It can be used as the main language or to implement individual modules. This makes the language extremely popular among scientists, especially in the fields of exact sciences – physics and mathematics. Dynamic typing - Dynamic typing causes Python to consume more resources than it should, but this is often compensated for by internal caching. We will give several examples of features of the Python language, that distinguish it from competitors. Probably the first difference between Python and other programming languages is the elegance and readability of the code. This allows an untrained person to easily read the code. Below are examples of functions that return the sum of two elements in languages Python and Java.

```
//Java_code
public class SumExample {
        public static int SumNumb (int a, int b) {
            int result = a + b;
            return result;
    }
}
```

```
#Python_code
def sum_numb (a, b):
    result = a + b
    return result
```

The language developers achieved this simplicity by replacing cumbersome curly braces with colons, which allowed them to write shorter and clearer code. The tab has become a significant symbol, which separates the body of the cycle/function/condition... from the code, which has a different type of hierarchy. Also, the developers decided to abandon the semicolon at the end of each line, which made the code even more readable. In commercial projects, this feature allows you to quickly understand code written by another programmer and continue to support it.

Ease of reading and use is enhanced by the many features and structures contained in Python. Here are some examples of them:

```
#Python_code
a = 4
b = 5
a, b = b, a # Simple change of variable values (swap). Now a = 5, b = 4
squares = [x ** 2 for x in range(1, 6)] # Creating of full list in one line
square = lambda x: x**2 # Creating anonymous function
my_list = [1, 2, 3]
k, p, g = my_list # Unpacking of list. Now k = 1, p = 2, g = 3
```

These features make Python a powerful and convenient programming language, making development easier and the code more compact and readable. We would also like to say something about the dynamic typing of the language. Although many high-level programming languages have this type of data typing, this factor can be decisive when choosing a main language, distinguishing it from some competitors. Moreover, dynamic typing made it easier for those who chose it as their first programming language, because the student does not have to think at the early stages about what data type to assign to a variable. Also, dynamic typing has other advantages, for example, creating an array whose elements will have different data types (example below).

```
#Python_code
    my_list =  [“string”, 1, True, 3.14, [1, 15, 3]] # This list contains different data types
```

For example, in C++, to create a list or array with different data types, you need to create separate structures that are inconvenient to fill. Python is among the top five most popular programming languages in the world, according to DOU. It is versatile and can be used to solve tasks on many platforms, including iOS, Android, Windows and server OSes. At the same time, Python has an English-language syntax that significantly simplifies reading and understanding the code. Today, when the computing power of personal computers and servers has become quite high, there is a huge demand for interpreted programming languages. After all, in addition to starting the program itself, it is necessary to start the interpreter, which requires additional resources. Python is just such a language.

References

1. What is the Python programming language? URL: https://blog.ithillel.ua/ru/articles/yazyk-programmirovaniya-python-s-chego-nachat-i-kuda-dvigatsya
2. What is Python and where is it used? URL: https://dan-it.com.ua/blog/python-chto-jeto-za-jazyk-programmirovanija-i-gde-ego-ispolzujut/
3. Python: pros and cons of the language, what problems it solves and is it worth studying URL: https://avada-media.ua/services/python-plyusy-i-minusy-yazyka-kakiye-zadachi-reshayet-i-stoit-li-izuchat/