

USING VISUAL PROGRAM TECHNOLOGY METHODS IN ENGINEERING EDUCATION

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ABSTRACT

This article explains how Python is a high-level programming language commonly used for general-purpose programming, with easy and easy-to-understand syntax, its affiliation with scripting programming languages, and how it differs with other programming environments. Python is a dynamic structure, object-oriented programming, functional programming, structured, automatic memory management and, of course, a multi-path programming language. Python has been written for various platforms, for example, Windows, Linux, Mac OSX, Palm OS, Mac OS. Python also has a built-in implementation for Microsoft.NET called IronPython. Today, many world-known companies use Python, such as NASA, Google, Yandex, CERN, Apple computer, Dream Works, space telescope institutes. Python Programming at Universities and Colleges in the United States (University of California, University of Florida, University of Lova, Massachusetts University of Technology), Canada (University of Toronto, Alberto University), UK (Oxford University), France, Russia, Australia, Spain language is used. One of the peculiarities of Python is that it doesn't need to take into account low-level details, such as memory management, when writing a program and avoiding redundant code while writing a program. One of the peculiarities of Python is that it doesn't need to take into account low-level details, such as memory management, when writing a program and avoiding redundant code while writing a program. This article also discusses about solving issues by using Python visual environment and building their graphics using Python 3d interface, Python programming language and graphic design, and their capabilities.

Keywords: Visualization, visual component, graphical interface, Python, bool, def, byte, array, complex, dict, float, memory review, slice.

INTRODUCTION, LITERATURE REVIEW AND DISCUSSION

Visualization - derived from the Latin word visualis, which in English means visual, informative. In other words, graphical images or objects are understood to refer to processes or events that make shaping objects easier.

Visualization is a way of expressing optical images in general terms. For example, photographs, charts, diagrams, content charts, tables, maps, and so on. Visualization methods are very effective in describing and illustrating objects.

Visualization, however, is a process of visualization of graphic representations of complex processes in the form of graphic shapes on the computer screen. Creating applications using visual aids is called visual programming

The software has been developed with a number of custom interface elements for visualization of interfaces - visual components that display various data and implement full control of the program.

One of the programming languages of computing nowadays is the Python programming language. Python is an easy-to-learn and advanced programming language. Python provides a high level of data structure and simple effective object-oriented programming styles.

The peculiarity of Python:

- Simple, easy to learn, simple syntax, easy to use, free and open source software.
- It is not necessary to consider low level details, such as memory management, during program writing.
- Works on many platforms without any changes.
- Spatial language. If you want the application to run faster, you can type this part in C or C ++ programming languages and then run it (called) it with the Python code.
- *Has a rich library;*
- *works with xml / html files;*
- *works with http queries;*
- *GUI (graphical interface);*
- *Web Scenario;*
- *Works with FTP;*
- *Used in Robotics;*
- *Programming mathematical and scientific calculations.*

It can be used in Python projecting. Because it does not have a limit and its capacity is very wide. It also differs from other programming languages with its simplicity and uniqueness.

Use of Python features. It is called a function group called operator that can be accessed from any part of the program several times. The function def keyword defines the function. After def word, a list of formal parameters is displayed in the function name and bracket. The function generates a space in the row after the generating instructions. As an example, we can create a function that lists the Fibonacci numbers:

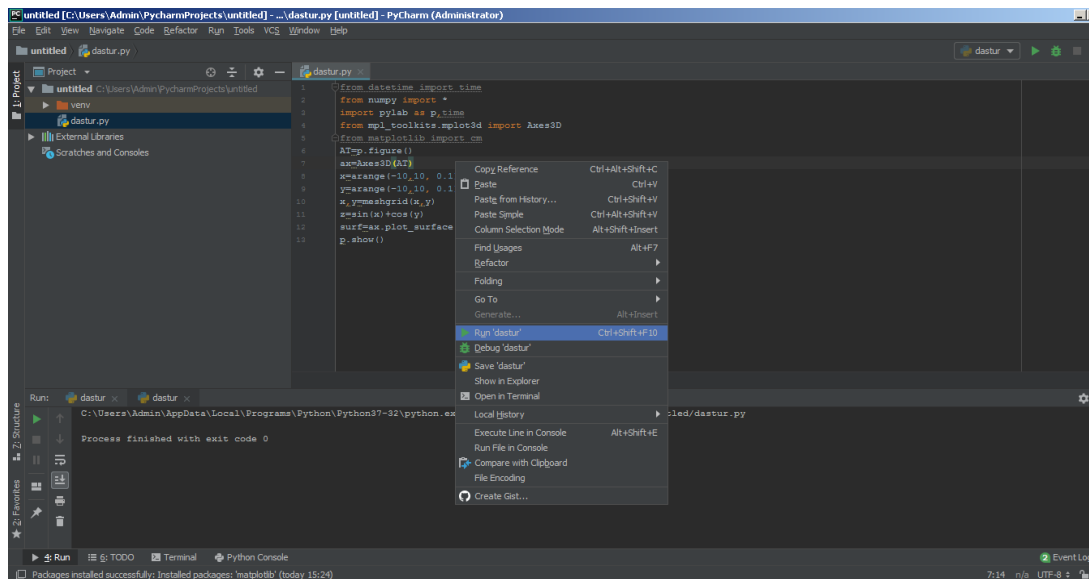
```
def fib(n):
    a,b =0,1
    while b<n:
        print(b),
        a, b = b, a+b # The block of function
fib(2000) # output of the function
```

Result: 1 2 2 3 5 8 13 21 34 55 89 144 233 377 610 987

Here are some examples of the Python programming language in the Python environment and its scheduling. Originally about the PyCharm environment: PyCharm is an indispensable modern environment for Python programming language. The code analysis tools, graphic fixes, unit tests, and Django (a free Python web application, which is supported by the project Django Software Foundation). PyCharm IntelliJ IDEET (JetBrains Java, Kotlin, C #, C ++, Ruby, Python, PHP, JavaScript, and others) based on IntelliJ IDEA (IntelliJ IDEA, JetBrains developed software development environment for Java, JavaScript, and

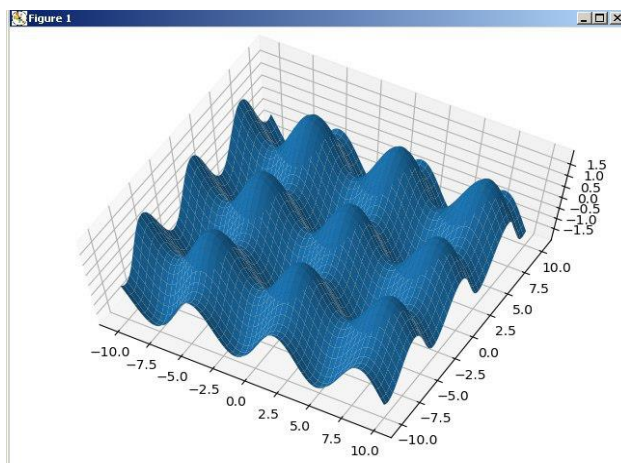
Python) and many others). Let's take a look at how to use the PyCharm environment to create 3D graphics.

By launching the program, we automatically download the necessary Matplotlib library on the Internet. Matplotlib is a Python programming language sized (2D) and three-dimensional graphics (including 3D graphics). In a ready-to-use software environment, we will program codes and compile the keypad by pressing the CTRL + SHIFT + F10 key combinations in the context menu by selecting the RUN command, that is, the result (Figure 1).



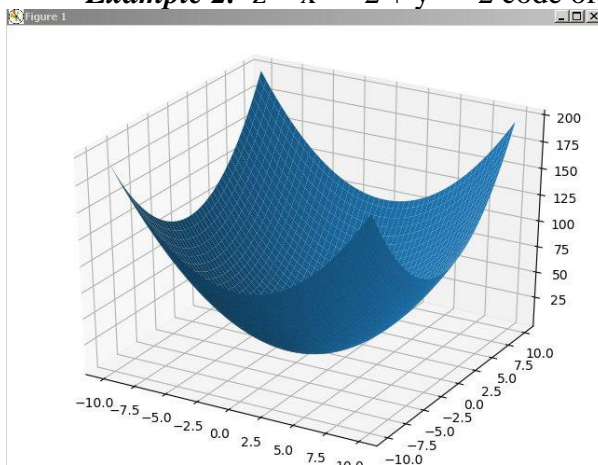
Picture 1. Compile the program.

Example 1. The program code and the three-dimensional graph of the function $z = \sin(x) + \cos(y)$:



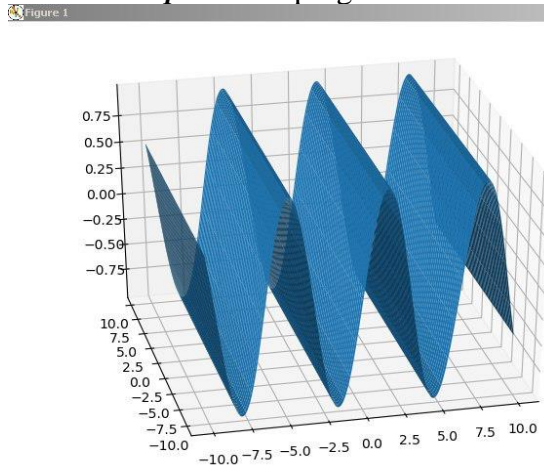
```
from datetime import time
from numpy import *
import pylab as p,time
from mpl_toolkits.mplot3d import
Axes3D
from matplotlib import cm
AT=p.figure()
ax=Axes3D(AT)
x=arange(-10,10, 0.1)
y=arange(-10,10, 0.1)
x,y=meshgrid(x,y)
z=sin(x)+cos(y)
surf=ax.plot_surface(x,y,z)
p.show()
```

Example 2. $z = x^2 + y^2$ code of the equation and three-dimensional graph:



```
from datetime import time
from numpy import *
import pylab as p,time
from mpl_toolkits.mplot3d import
Axes3D
from matplotlib import cm
AT=p.figure()
ax=Axes3D(AT)
x=arange(-10,10, 0.1)
y=arange(-10,10, 0.1)
x,y=meshgrid(x,y)
z=x**2+y**2
surf=ax.plot_surface(x,y,z)
p.show()
```

Example 3. z = program code of sin (x) and three-dimensional graph:



```
from datetime import time
from numpy import *
import pylab as p,time
from mpl_toolkits.mplot3d import
Axes3D
from matplotlib import cm
AT=p.figure()
ax=Axes3D(AT)
x=arange(-10,10, 0.1)
y=arange(-10,10, 0.1)
x,y=meshgrid(x,y)
z=sin(x)
surf=ax.plot_surface(x,y,z)
p.show()
```

In summary, we can say that the Python programming language has a great deal of history, features, and functionality for users working in the Python program. Python has a very rich library of information, including many modules, including features and applications, and examples of how to practice in it. Using the fast possibilities of the language environment it is possible to create three dimensional models using the mathematical models of engineering subjects.

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INTERNET RESOURCES

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9. www.texnoman.uz