

SUN'IY INTELLEKT ASOSLARI



SIA1046

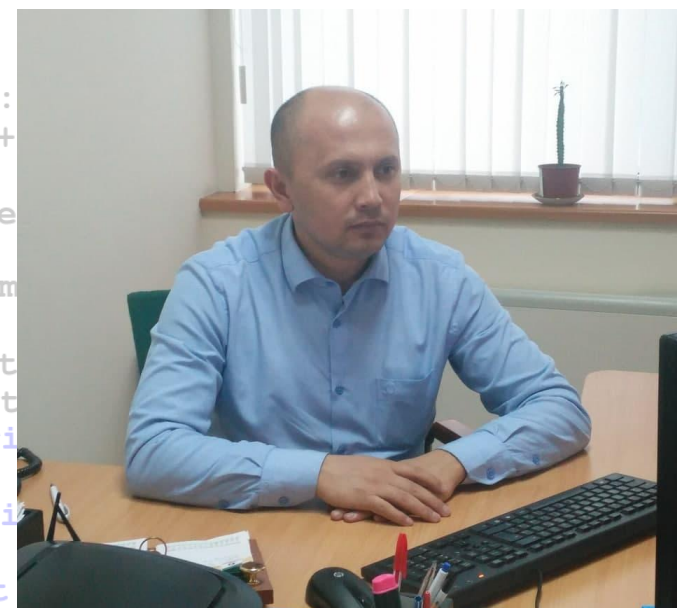
01

Python tashqi kutubxonasi. PyPi.org bilan ishlash



STA

```
def add5(x):  
    return x+5  
  
def dotwrite  
    nodename  
    label=sym  
    print '  
    if isinstance  
    if ast  
    pri  
    else:  
    pri  
    else:  
    print  
    children = []
```



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```
for name in children:  
    print '%s' % name,
```

Reja



1. Data analysisda Pandas kutubxonasi.
2. Series Ma'lumotlar tuzilmasi.
3. DataFrame Ma'lumotlar tuzilmasi.
4. Indekslar. Qator va ustunlarni tashlab yuborish.
5. Elementlarni tanlash.
6. Arifmetik amallar.
7. Funktsiyalarni qo'llash.
8. Tartiblash. Reytinglash
9. Dataset statistikasi: min, max, o'rta qiymat, summa va korrelyasiya.
10. Ma'lumotlarni filtrlash.

Python tashqi kutubxonalari

Tashqi kutubxona (external library) — bu Python dasturlash tiliga dasturchilar tomonidan yaratilgan va til imkoniyatlarini kengaytiruvchi tayyor funksiyalar, sinflar va modullar to'plamidir.

Python o'zi bilan birga asosiy modullarni (masalan, math, os, datetime) o'rnatadi. Ammo murakkab loyihalarda bizga qo'shimcha imkoniyatlar kerak bo'ladi

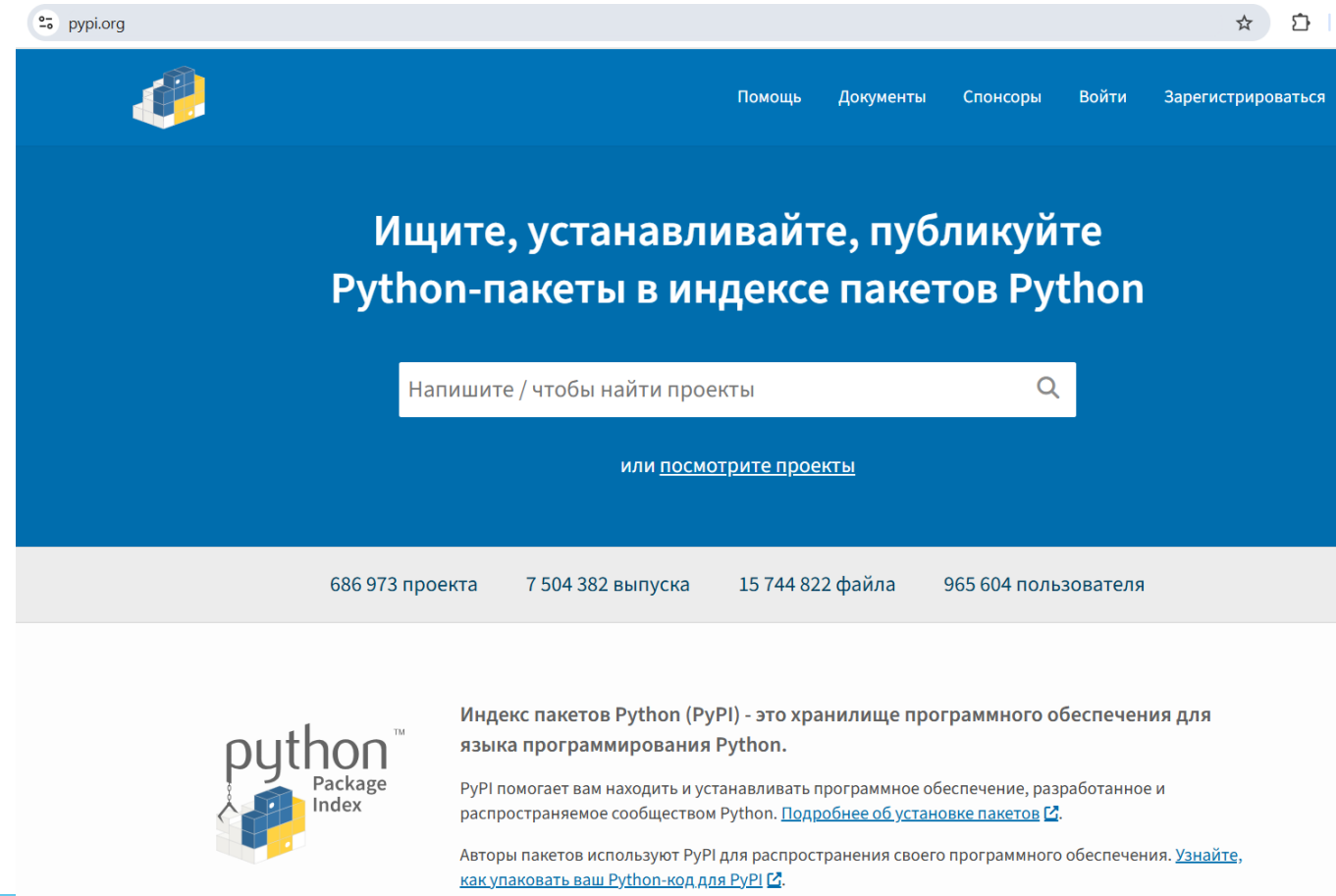
Yo'nalish	Tashqi kutubxona	Vazifasi
Ma'lumotlar tahlili	NumPy, Pandas	Jadval, massiv va statistik tahlil
Grafik vizualizatsiya	Matplotlib, Seaborn, Plotly	Diagramma, grafiklar
Sun'iy intellekt va ML	TensorFlow, scikit-learn, PyTorch	Mashinaviy o'rganish, neyron tarmoqlar
Veb dasturlash	Flask, Django, FastAPI	Veb ilovalar yaratish
Foydalanuvchi interfeysi	Tkinter, PyQt5, Kivy	Grafikli dasturlar (GUI)
Tarmoq ishlari	Requests, BeautifulSoup, Scrapy	Veb-so'rovlar, ma'lumot yig'ish

PyPI.org nima?

PyPI (Python Package Index) — bu Python kutubxonalari ombori (repository) bo'lib, butun dunyodagi dasturchilar tomonidan yaratilgan minglab paketlar shu yerda saqlanadi.

PyPI ning vazifasi:

- Python kutubxonalarini **saqlash**, **tarqatish** va **yangilash**.
- Dasturchilarga o'z kutubxonalarini joylashtirish imkonini berish.
- pip vositasi orqali avtomatik o'rnatish imkoniyatini yaratadi.



PyPI vs GitHub



GitHub - Kodlarni saqlash, versiya boshqaruv

PyPI - Kutubxonalarni tarqatish va o'rnatish platformasi

Paketlar tarkibi. Dasturchi yangi nashrni PyPI ga yuklaganda, u repozitoriydagi barcha fayllarni emas, balki faqat paketni o'rnatish uchun zarur bo'lgan fayllarni o'z ichiga oladi. Shuning uchun PyPI arxivlari kamroq.

Paketlarni chiqarish. Dasturchi GitHub'da paketning yangi versiyasini chiqarganda, u ko'pchilik foydalanuvchilar uchun mo'ljallanmagan bo'lishi mumkin. Nashr PyPIda paydo bo'lmaguncha, u umumiy foydalanish uchun tayyor emas deb hisoblanishi kerak.

Foydalanish maqsadlari PyPI paketlar bilan ishlash uchun, GitHub esa birgalikda ishlab chiqish va kod almashish uchun ko'proq mos keladi.

Kutubxona o'rnatish



Terminal yoki PowerShell'da quyidagicha yoziladi:

`pip install numpy`

```
Windows PowerShell
(C) Корпорация Майкрософт (Microsoft Corporation). Все права защищены.

Установите последнюю версию PowerShell для новых функций и улучшения! https://aka.ms/PSWindows

PS C:\Users\user> pip install numpy
Defaulting to user installation because normal site-packages is not writeable
Collecting numpy
  Downloading numpy-2.3.3-cp313-cp313-win_amd64.whl.metadata (60 kB)
  Downloading numpy-2.3.3-cp313-cp313-win_amd64.whl (12.8 MB)
    ━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━━ 12.8/12.8 MB 8.2 MB/s eta 0:00:00
Installing collected packages: numpy
```

Bu buyruq PyPI.org dan **NumPy** kutubxonasini yuklab olib, tizimga o'rnatadi.

Bir necha kutubxonani bir vaqtning o'zida o'rnatish



```
pip install numpy pandas matplotlib
```

```
Windows PowerShell
Successfully installed pip-25.2
PS C:\Users\user> pip install numpy pandas matplotlib
Defaulting to user installation because normal site-packages is not writeable
Requirement already satisfied: numpy in c:\users\user\appdata\roaming\python\python313\site-packages (2.3.3)
Collecting pandas
  Downloading pandas-2.3.3-cp313-cp313-win_amd64.whl.metadata (19 kB)
Collecting matplotlib
  Downloading matplotlib-3.10.7-cp313-cp313-win_amd64.whl.metadata (11 kB)
Collecting python-dateutil>=2.8.2 (from pandas)
  Downloading python_dateutil-2.9.0.post0-py2.py3-none-any.whl.metadata (8.4 kB)
Collecting pytz>=2020.1 (from pandas)
  Downloading pytz-2025.2-py2.py3-none-any.whl.metadata (22 kB)
Collecting tzdata>=2022.7 (from pandas)
  Downloading tzdata-2025.2-py2.py3-none-any.whl.metadata (1.4 kB)
Collecting contourpy>=1.0.1 (from matplotlib)
  Downloading contourpy-1.3.3-cp313-cp313-win_amd64.whl.metadata (5.5 kB)
Collecting cycler>=0.10 (from matplotlib)
  Downloading cycler-0.12.1-py3-none-any.whl.metadata (3.8 kB)
```

O'rnatilgan barcha kutubxonalarni ko'rish



pip list

Kutubxonani o'chirish:

pip uninstall numpy

Foydalanilgan barcha kutubxonalarni avtomatik ko'rish uchun:

pip freeze > requirements.txt

```
PS C:\Users\user> pip list
Package            Version
-----
contourpy          1.3.3
cycler              0.12.1
fonttools           4.60.1
kiwisolver          1.4.9
matplotlib          3.10.7
numpy               2.3.3
packaging           25.0
pandas              2.3.3
pillow              11.3.0
pip                 25.2
pyparsing           3.2.5
python-dateutil     2.9.0.post0
pytz                2025.2
six                 1.17.0
tzdata              2025.2
PS C:\Users\user>
```

```
C:\Users\user\requirements.txt - Notepad++
Файл  Правка  Поиск  Вид  Кодировки  Синтаксисы  Опции  Инструменты  Макросы
requirements.txt
1  contourpy==1.3.3
2  cycler==0.12.1
3  fonttools==4.60.1
4  kiwisolver==1.4.9
5  matplotlib==3.10.7
6  numpy==2.3.3
7  packaging==25.0
8  pandas==2.3.3
9  pillow==11.3.0
10 pyparsing==3.2.5
11 python-dateutil==2.9.0.post0
12 pytz==2025.2
13 six==1.17.0
14 tzdata==2025.2
15
```

PyPI'da kutubxonani izlash va o'rganish



PyPI saytidan foydalanish:

1.Kirish: <https://pypi.org>

2.Qidiruv oynasiga kutubxona nomini yozing (masalan, "numpy").

3.Kutubxona sahifasida:

- tavsif (description),
- o'rnatish ko'rsatmasi (pip install ...),
- versiyalar,
- manba kod (GitHub havolasi),
- muallif va litsenziya haqida ma'lumot beriladi.

The screenshot shows the NumPy package page on PyPI. The page is divided into several sections:

- Описание проекта** (Project description): This section is currently empty.
- История выпусков** (Release history): This section is currently empty.
- Загрузка файлов** (Download files): This section is currently empty.
- Проверенные детали** (Verified details): This section contains information about the package's status, including a green checkmark icon and the text "Эти сведения были проверены PyPI".
- Owner**: The owner is listed as "NumPy".
- Сопровождающие** (Accompanying): This section lists the authors of the package: "charlesr.harris", "matthew.brett", "mattip", and "teoliphant".
- Непроверенные данные** (Unverified data): This section contains information about the package's status, including a red checkmark icon and the text "Эти сведения не проверены PyPI".
- Ссылки проекта** (Project links): This section contains links to the package's documentation, download, homepage, release notes, and source code.
- NumPy logo**: The NumPy logo is displayed prominently.
- Stats bar**: A bar showing various statistics: "powered by NumFOCUS", "PyPI downloads 539M/month", "Conda downloads 112M", "stackoverflow Ask questions", "DOI 10.1038/s41586-020-2649-2", "openssf scorecard 7.2", "types typed".
- Description**: A paragraph stating "NumPy is the fundamental package for scientific computing with Python."
- Links**: A list of links: "Website: <https://numpy.org>", "Documentation: <https://numpy.org/doc>", "Mailing list: <https://mail.python.org/mailman/listinfo/numpy-discussion>", "Source code: <https://github.com/numpy/numpy>", "Contributing: <https://numpy.org/devdocs/dev/index.html>", "Bug reports: <https://github.com/numpy/numpy/issues>", "Report a security vulnerability: <https://tidelift.com/docs/security>".
- It provides:** A list of features: "a powerful N-dimensional array object", "sophisticated (broadcasting) functions", "tools for integrating C/C++ and Fortran code", "useful linear algebra, Fourier transform, and random number capabilities".
- Testing:** A paragraph stating "NumPy requires `pytest` and `hypothesis`. Tests can then be run after installation with:"
- Code of Conduct**: A section for the code of conduct.

PyPI.org bilan ishlash



Maqsad	Buyruq	Izoh
Kutubxona o'rnatish	<code>pip install package_name</code>	Masalan: <code>pip install requests</code>
Versiyasini tekshirish	<code>pip show package_name</code>	Versiya, joylashuvi va muallif
Yangilash	<code>pip install --upgrade package_name</code>	Eng yangi versiyaga o'tkazish
O'chirish	<code>pip uninstall package_name</code>	
Hamma o'rnatilganlar ro'yxati	<code>pip list</code>	
Kutubxona ma'lumotini saqlash	<code>pip freeze > requirements.txt</code>	Loyihada ishlatilgan paketlarni saqlash

Sun'iy intellekt uchun kutubxonalar o'rnatish



pip install numpy pandas scikit-learn matplotlib tensorflow

```

      8.7/8.7 MB 8.3 MB/s 0:00:01
Downloading tensorflow-2.20.0-cp313-cp313-win_amd64.whl (332.0 MB)
      332.0/332.0 MB 6.9 MB/s 0:00:44
Downloading grpcio-1.75.1-cp313-cp313-win_amd64.whl (4.6 MB)
      4.6/4.6 MB 7.0 MB/s 0:00:00
Downloading ml_dtypes-0.5.3-cp313-cp313-win_amd64.whl (208 kB)
Downloading requests-2.32.5-py3-none-any.whl (64 kB)
Downloading charset_normalizer-3.4.3-cp313-cp313-win_amd64.whl (107 kB)
Downloading idna-3.10-py3-none-any.whl (70 kB)
Downloading tensorboard-2.20.0-py3-none-any.whl (5.5 MB)
      5.5/5.5 MB 7.1 MB/s 0:00:00
Downloading tensorboard_data_server-0.7.2-py3-none-any.whl (2.4 kB)
Downloading typing_extensions-4.15.0-py3-none-any.whl (44 kB)
Downloading urllib3-2.5.0-py3-none-any.whl (129 kB)
Downloading absl_py-2.3.1-py3-none-any.whl (135 kB)
Downloading astunparse-1.6.3-py2.py3-none-any.whl (12 kB)
Downloading wheel-0.45.1-py3-none-any.whl (72 kB)
Downloading certifi-2025.10.5-py3-none-any.whl (163 kB)
Downloading flatbuffers-25.9.23-py2.py3-none-any.whl (30 kB)
Downloading gast-0.6.0-py3-none-any.whl (21 kB)
Downloading google_pasta-0.2.0-py3-none-any.whl (57 kB)
Downloading h5py-3.14.0-cp313-cp313-win_amd64.whl (2.9 MB)
      2.9/2.9 MB 6.6 MB/s 0:00:00
Downloading joblib-1.5.2-py3-none-any.whl (308 kB)
Downloading keras-3.11.3-py3-none-any.whl (1.4 MB)
      1.4/1.4 MB 6.0 MB/s 0:00:00
Downloading libclang-18.1.1-py2.py3-none-win_amd64.whl (26.4 MB)
      26.4/26.4 MB 7.2 MB/s 0:00:03
Downloading markdown-3.9-py3-none-any.whl (107 kB)
Downloading opt_einsum-3.4.0-py3-none-any.whl (71 kB)
Downloading protobuf-6.32.1-cp310-abi3-win_amd64.whl (435 kB)
Downloading scipy-1.16.2-cp313-cp313-win_amd64.whl (38.5 MB)
      38.5/38.5 MB 8.7 MB/s 0:00:04
Downloading setuptools-80.9.0-py3-none-any.whl (1.2 MB)
      0.0/1.2 MB ? eta -:--:--
```

Sun'iy intellekt uchun kutubxonalar o'rnatish



```
import numpy as np
import pandas as pd
from sklearn.linear_model import LinearRegression
import matplotlib.pyplot as plt

# Oddiy model
x = np.array([[1], [2], [3], [4]])
y = np.array([2, 4, 6, 8])
model = LinearRegression()
model.fit(x, y)
print(model.predict([[5]])) # natija: [10.]
```

1. IDLE
2. VS Code
3. Jupyter Notebook
4. Google Colab
5. ...

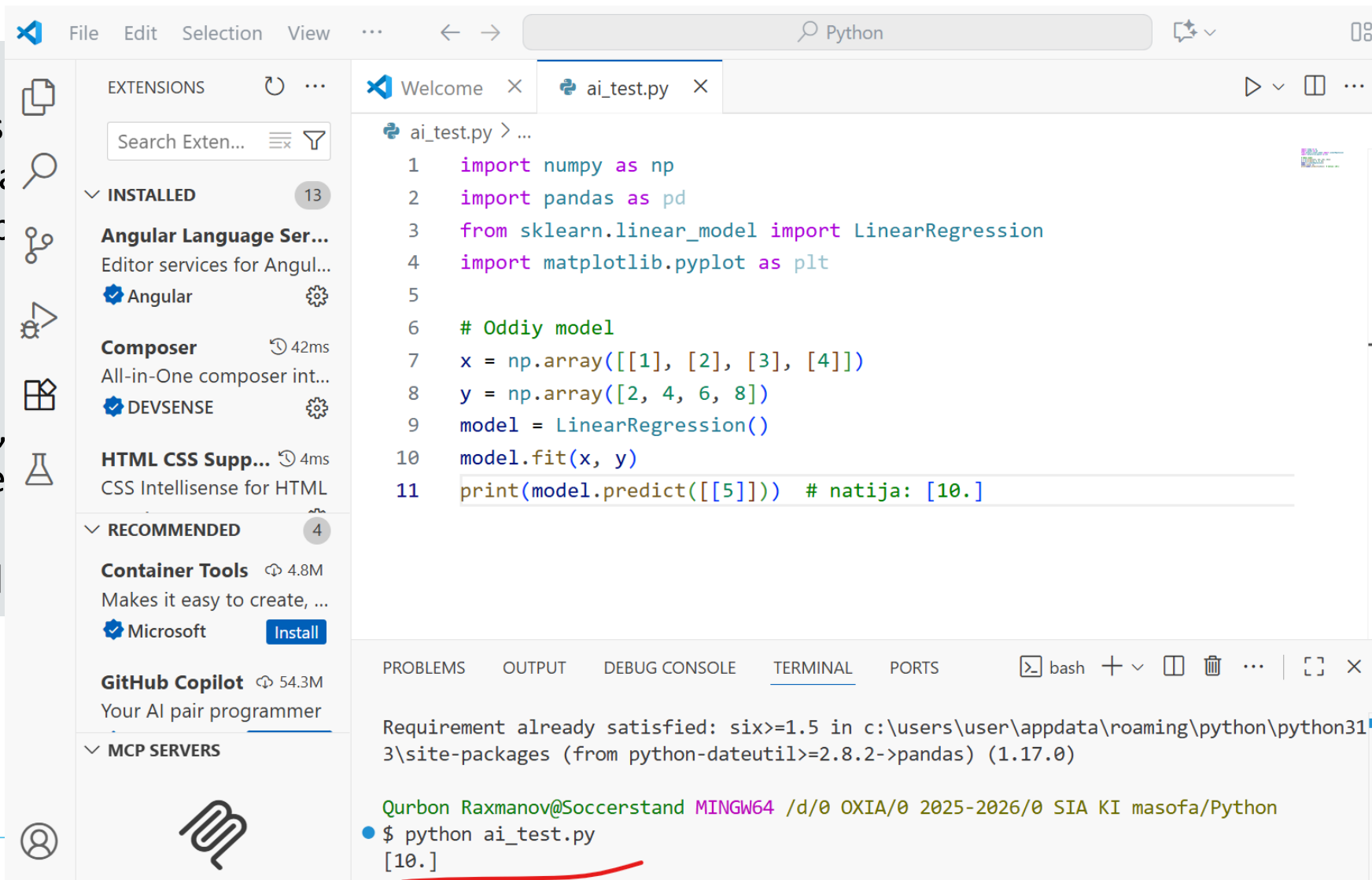
Shu dasturlarda ishlatib korish mumkin

Sun'iy intellekt uchun kutubxonalar o'rnatish (VSCODE)



```
import numpy as np
import pandas as pd
from sklearn.linear_model import LinearRegression
import matplotlib.pyplot as plt
```

```
# Oddiy model
x = np.array([[1], [2], [3], [4]])
y = np.array([2, 4, 6, 8])
model = LinearRegression()
model.fit(x, y)
print(model.predict([[5]]))
```



Nima uchun natija 10 chiqdi



Sun'iy intellekt (aniqrog'i, mashinaviy o'qitish) - jarayonidagi modelni o'qitish bosqichini ifodalaydi.

```
# Oddiy model
x = np.array([[1], [2], [3], [4]])
y = np.array([2, 4, 6, 8])
model = LinearRegression()
model.fit(x, y)
print(model.predict([[5]])) # natija: [10.]
```

model.fit(x, y)

Bu yerda **fit()** metodi modelni “o'qitadi”.

Yani:

- **x** — **kiruvchi ma'lumotlar** (input yoki mustaqil o'zgaruvchi),
 - **y** — **chiqish natijalari** (output yoki bog'liq o'zgaruvchi).
- fit()** metodi shu **x** va **y** orasidagi **matematik munosabatni** topadi.
Misol uchun, bu holatda u **$y = 2x$** ekanini o'rganadi.

mmodel = LinearRegression()

Bu satr bilan **chiziqli regressiya modelini** yaratiladi.

Bu model **ma'lumotlar orasidagi bog'liqlikni (munosabatni)** o'rganadi.

x	y
1	2
2	4
3	6
4	8

Jadvaldagi **x** ortsa, **y** ham ortadi.
Bunda **chiziqli bog'liqlik** mavjud.

model.predict([[5]])

Endi modeldan foydalanib, **x = 5 bo'lganda y qancha bo'ladi?** degan savolni beramiz.

Model ilgari o'rgangan bog'liqlikka (**$y = 2x$**) asoslanib, **natija [10.]** ni qaytaradi.

Uy maydoni asosida narxni aniqlash

```
import numpy as np
from sklearn.linear_model import LinearRegression

# Ma'lumotlar (x - maydon, y - narx)
x = np.array([[50], [60], [80], [100], [120]]) # kv.m
y = np.array([30000, 35000, 45000, 55000, 65000]) # dollar

# Model yaratamiz
model = LinearRegression()

# Modelni o'qitamiz
model.fit(x, y)

# Yangi qiymat uchun bashorat qilamiz
maydon = 90
narx = model.predict([[maydon]])

print(f"{maydon} kv.m uy taxminan {narx[0]:.0f} dollarga tushadi.")
```

Uy maydoni asosida narxni aniqlash



```
import numpy as np
from sklearn.linear_model import LinearRegression

# Ma'lumotlar (x - maydon, y - narx)
x = np.array([[50], [60], [80], [100], [120]])
y = np.array([30000, 35000, 45000, 55000, 65000])

# Model yaratamiz
model = LinearRegression()

# Modelni o'qitamiz
model.fit(x, y)

# Yangi qiymat uchun bashorat qilamiz
maydon = 90
narx = model.predict([[maydon]])

print(f"{maydon} kv.m uy taxminan {narx[0]:.0f} dollarga tushadi.")
```

```
Welcome x ai_test.py x
ai_test.py > ...
5 x = np.array([[50], [60], [80], [100], [120]]) # kv.m
6 y = np.array([30000, 35000, 45000, 55000, 65000]) # dollar
7 # Model yaratamiz
8 model = LinearRegression()
9 # Modelni o'qitamiz
10 model.fit(x, y)
11 # Yangi qiymat uchun bashorat qilamiz
12 maydon = 90
13 narx = model.predict([[maydon]])
14 print(f"{maydon} kv.m uy taxminan {narx[0]:.0f} dollarga tushadi.")

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL PORTS
Qurbon Raxmanov@Soccerstand MINGW64 /d/0 OXIA/0 2025-2026/0 SIA KI masofa/Python
$ python ai_test.py

Qurbon Raxmanov@Soccerstand MINGW64 /d/0 OXIA/0 2025-2026/0 SIA KI masofa/Python
$ python ai_test.py
90 kv.m uy taxminan 50000 dollarga tushadi.
```

SUN'IY INTELLEKT ASOSLARI

```
def add5(x):  
    return x+5  
  
def determine(ast):  
    nodename = getNodeName()  
    label=symbol.sym_name.get(int(ast[0]),ast[0])  
    print '    %s [label="%s' % (nodename, label),
```

E'tiboringiz uchun rahmat!

```
else:  
    print '"]';  
    children = []  
    for n, child in ast.items():  
        children.append(determine(child))  
    print '    %s [%s' % (nodename, children)  
    for name in children:  
        print '%s' % name,
```

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