Pyton 3.6+ moduli

Koji vi birate?

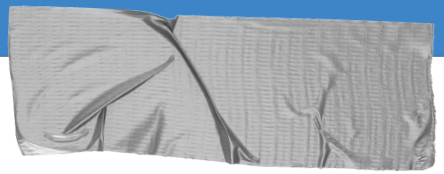
Šta su to moduli?

Moduli su fajlovi koji sadrže Python kod. Oni omogućavaju da se Python kod logički organizuje.

```
import module as m
m.do_something()
m.hello_world()

for x in m.my_collection:
    print(x.data)
```

Opcije?

- Python turtle (crtanje)
- Python speech_recognition (audio->tekst)
- Python PIL (modifikacija slika)
- Python matplotlib (crtanje grafikona)
- Python math (matematicke funkcije)
- Python pygame (igrice i animacije)
- Python csv (rad sa podacima)
- Python re (rad sa regularnim izrazima)

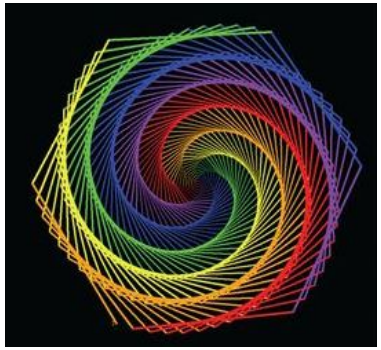


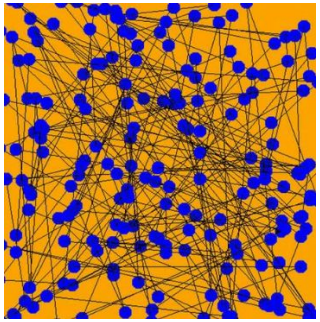
1. turtle

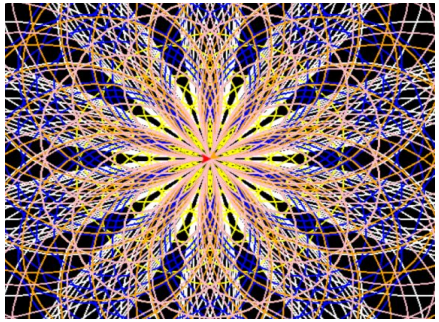
Turtle je Python modul kojim se mogu iscrtavati razne geometrijske slike.

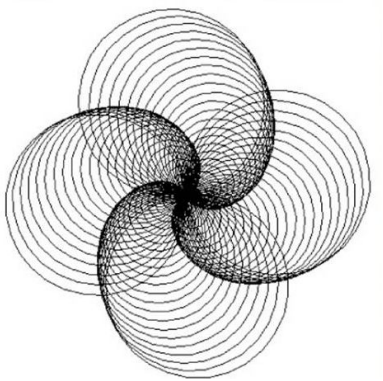
➔ **Jednostavno iscrtavanje**
Koristi se strelica kojoj se zadaje putanja kojom se crta linija.

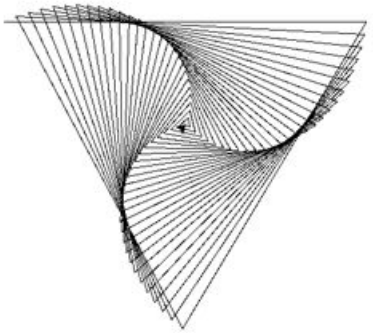
➔ **Bezbrojne mogućnosti**
Šarene konture i zanimljive sličice









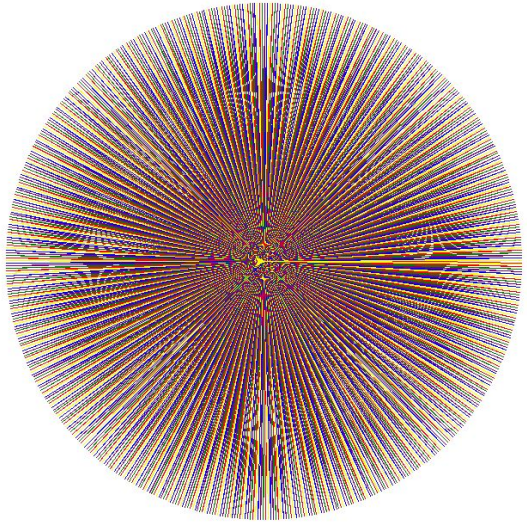


Jednostavno

iscrtavanje,

Manje koda,

Više slika



2. speech_recognition

Speech recognition je modul koji omogućava prepoznavanje engleskih reči na osnovu nekog audio unosa.

➔ **Zvuk**

Očitavanje zvučnog fajla iz datoteke ili direktno sa mikrofona kao ulaz.

➔ **Prevođenje u tekst**

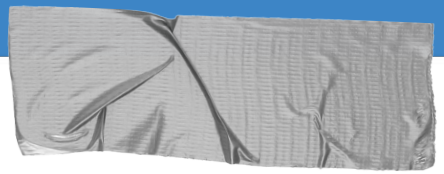
Poznavanje engleskog jezika i prepoznavanje reči na osnovu samih zvučnih signala.

Prepoznavanja teksta izrečenog u mikrofon i prevođenje u string koji se ispisuje.

speech.py

```python
import speech_recognition as sr

r = sr.Recognizer()

with sr.Microphone() as source:
    print('Speak Anything : ')
    audio = r.listen(source)

    try:
        text = r.recognize_google(audio)
        print('You said : {}'.format(text))
    except:
        print('Sorry could not recognize your voice')
```

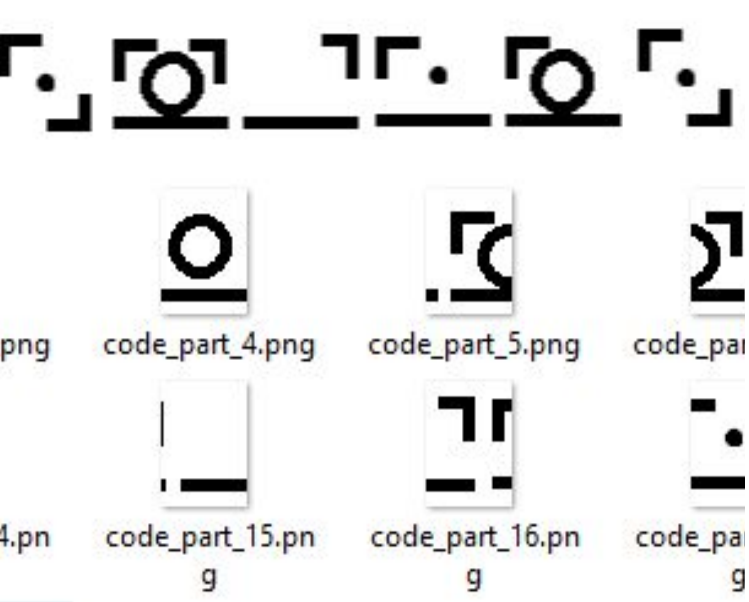
```
Speak Anything :
You said : so I am saying hello
umang@umang-HP-Notebook:~/youtube$
```



3. PIL

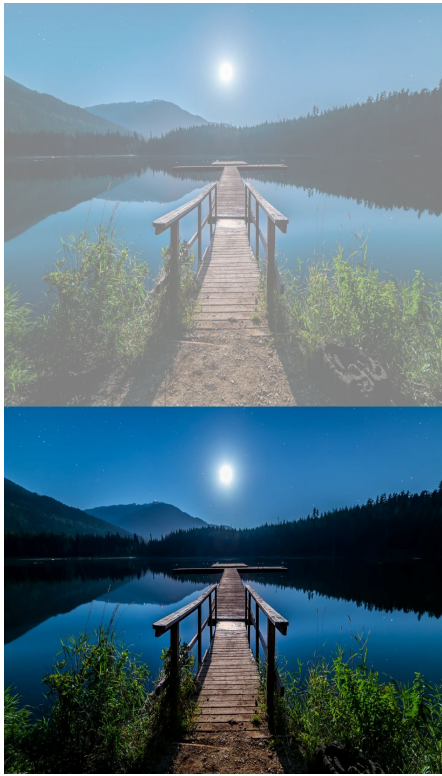
PIL (Python Image Library) je modul koji omogućava obradu slika vršeći izmene nad samim pikselima.

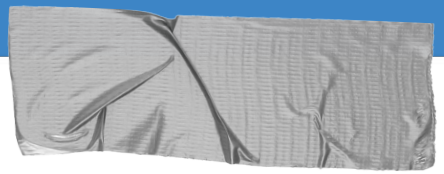
- ➔ **Matrice**
  Glavna struktura kojom se slika predstavlja
- ➔ **Slike**
  Glavna jedinica koji se koristi je slika.
- ➔ **“Fizička” obrada**
  Skraćivanje i sečenje slika.
- ➔ **Efekti i filteri**
  Povećavanje osvetljenosti, kontrasta, ...




```python
from PIL import Image

slike = list()
my_img = Image.open("code_fin.png")

upper = 0
lower = 50

for i in range(0,24):
    left = i * 35
    right = (i + 1) * 35
    new_img = my_img.crop((left, upper, right, lower))
    slike.append(new_img)

for k in range(len(slike)):
    slike[k].save("code_part_" + str(k) + ".png")
```

Brz i jednostavan način da se izvrši neka modifikacija fotografije.





4. matplotlib

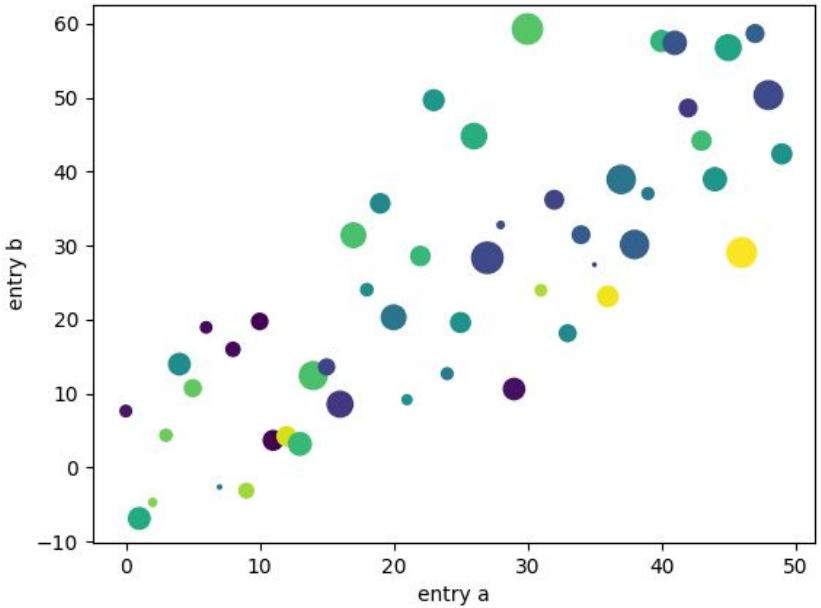
Matplotlib (Math Plotting Library) je modul koji omogućava skiciranje i interaktivan pregled grafikona.

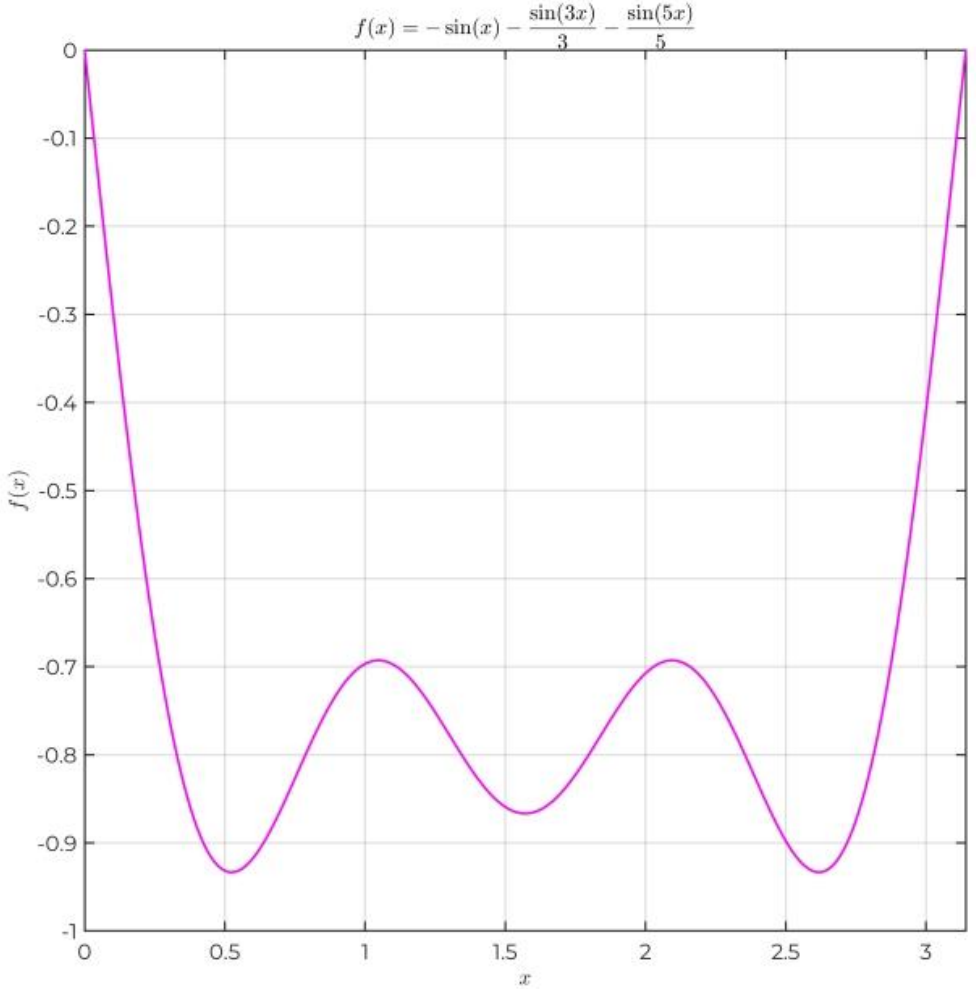
➔ **Grafik funkcije**
Postoji mogućnost skiciranja funkcije na zadatom intervalu.

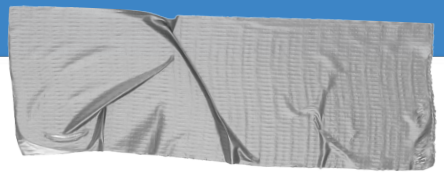
➔ **Podaci**
Vizuelna reprezentacija podataka i odnosa među podacima.

➔ **Analiza podataka**
Podaci se lako mogu posmatrati i analizirati pomoću grafikona.

Primer skiciranja grafika funkcije i prikaz podataka.







5. math

Math je modul koji omogućava dodatne operacije nad brojevima poput računanja korena, apsolutnih vrednosti i drugih.

- ➔ **Matematičke konstante**
  Na primer: π=3,1415926535...
- ➔ **Matematičke funkcije**
  Funkcije kojim se određuju: hipotenuza trougla, vrednost ugla u radijanima ili stepenima, da li je realan broj pozitivna ili negativna beskonačnost, ...

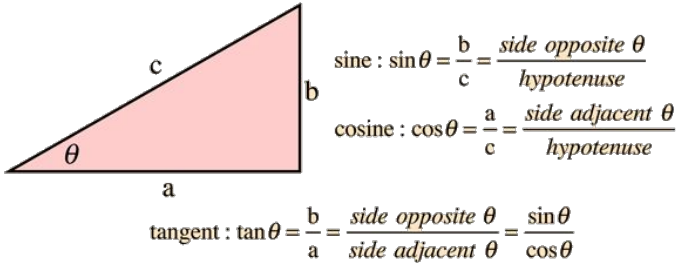
Constants

```
>>> import math
>>> math.pi
3.141592653589793
>>> math.e
2.718281828459045
```

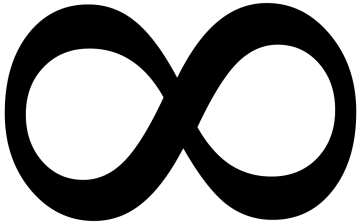
Uglovi,

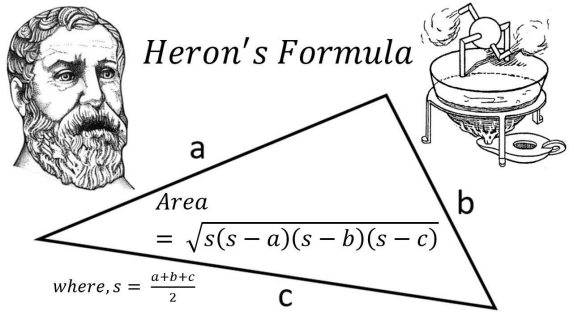
Beskonačnosti,

NaN - Not A Number



Detaljna analiza ugrađenih funkcija koje se mogu koristiti u matematičkim proračunima.



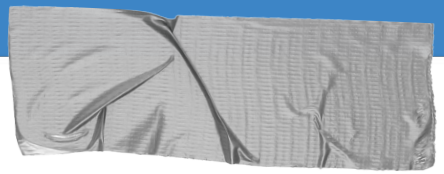


9.2. `math` — Mathematical functions

This module is always available. It provides access to the mathematical functions defined by the C standard.

These functions cannot be used with complex numbers; use the functions of the same name from the `cmath` module if you require support for complex numbers. The distinction between functions which support complex numbers and those which don't is made since most users do not want to learn quite as much mathematics as required to understand complex numbers. Receiving an exception instead of a complex result allows earlier detection of the unexpected complex number used as a parameter, so that the programmer can determine how and why it was generated in the first place.

The following functions are provided by this module. Except when explicitly noted otherwise, all return values are floats.



6. pygame

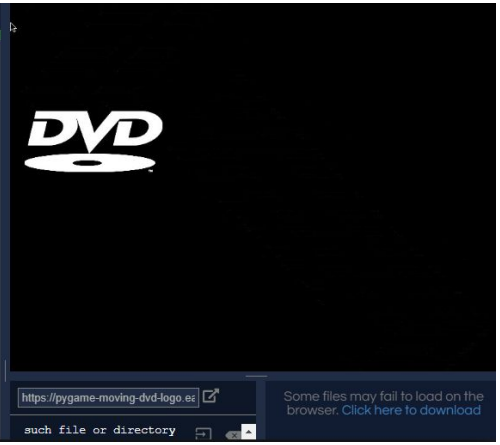
Pygame (Python Game) je modul koji obezbeđuje kreiranje jednostavnih 2D i pseudo 3D igrica i animacija.

➔ **Aplikacije, igrice i animacije**
Aplikacije poput Paint-a, igrice poput zmije i animacije poput screensaver-a.

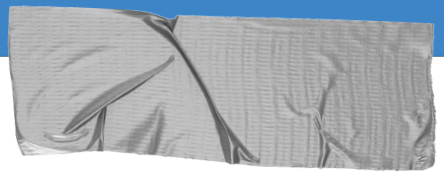
➔ **Frame-ovi**
Kadar kao grafički panel koji aplikacija popunjava nekim sadržajem u datoj jedinici vremena.

main.py saved

```python
import pygame, time

pygame.init()
width, height = 800, 600
dvdLogoSpeed = [1, 1]
backgroundColor = 0, 0, 0

screen = pygame.display.set_mode((width, height))

dvdLogo = pygame.image.load("dvd-logo-white.png")
dvdLogoRect = dvdLogo.get_rect()

while True:
    screen.fill(backgroundColor)

    screen.blit(dvdLogo, dvdLogoRect)
    dvdLogoRect = dvdLogoRect.move(dvdLogoSpeed)

    if dvdLogoRect.left < 0 or dvdLogoRect.right > width:
        dvdLogoSpeed[0] = -dvdLogoSpeed[0]
    if dvdLogoRect.top < 0 or dvdLogoRect.bottom > height:
        dvdLogoSpeed[1] = -dvdLogoSpeed[1]

    pygame.display.flip()
    time.sleep(10 / 1000)
```



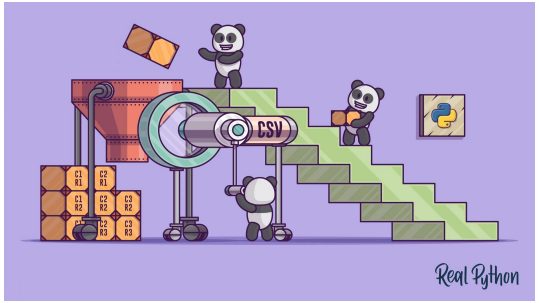
- Jednostavni screensaver-i
- Složene igrice
- Grafički korisnički interfejs
- Kadrovi

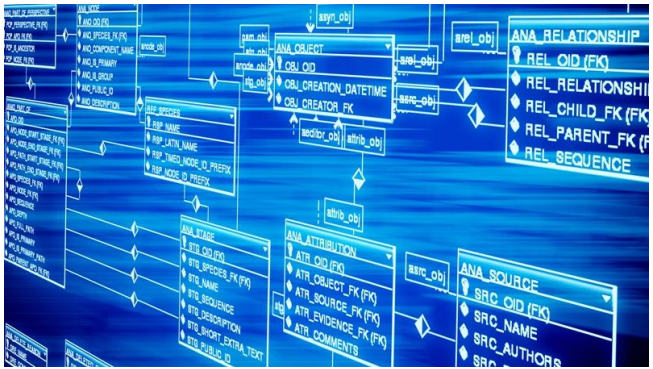


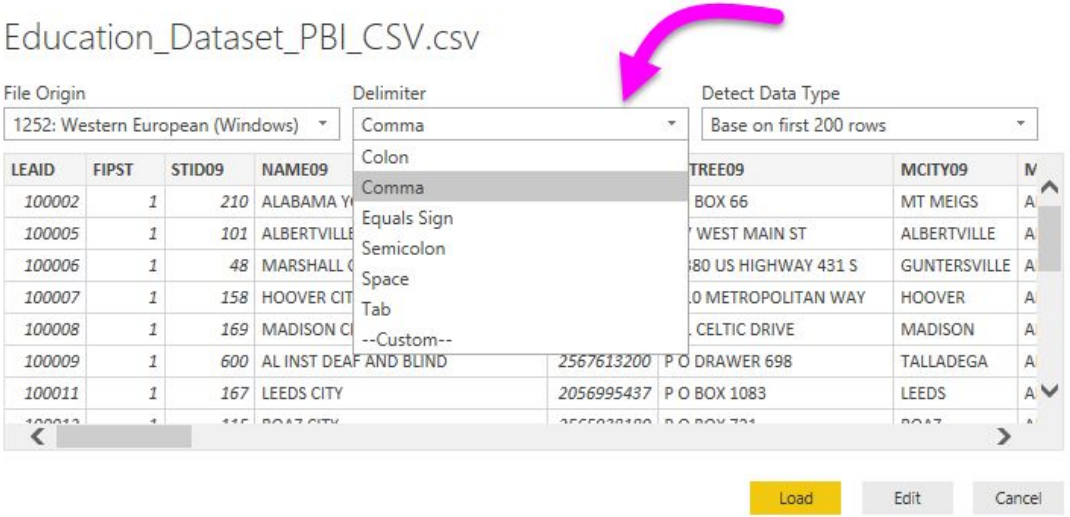
7. csv

Csv (Comma Separated Values) je modul koji omogućava rad sa fajlovima ekstenzije .csv koji obično sadrže neke podatke nad kojima se može vršiti neka obrada.

- ➔ **.csv datoteke**
  Kreiranje, čuvanje i otvaranje.
- ➔ **Podaci i tabele**
  Svi podaci su indeksirani i svaka vrsta predstavlja jednu n-torku podataka.
- ➔ **Pretraga po podacima**
  Pisanje različitih funkcija za pronalaženje odgovarajućih podataka.

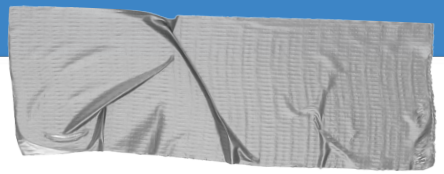






Najjednostavniji način čuvanja podataka - datoteke

```
,Vendor ID,Vendor Name,Cost Element,Expenditure Account Code Description,Document No,Amount,Clearing Date
,18000063,CIRCLE ANGLIA LIMITED,544076,HSG Grants to Registered Providers,1900017038,"4,007,633.00",06 Feb  2013
,18000050,ONE HOUSING GROUP LIMITED,544076,HSG Grants to Registered Providers,1900017214,"3,047,294.00",01 Mar  2013
,18000010,NOTTING HILL HOUSING TRUST,544076,HSG Grants to Registered Providers,1900017060,"2,850,000.00",07 Feb  2013
,18000078,BERKELEY PARTNERSHIP HOMES LIMITED,544078,HSG Grants to Non-Registered Providers,1900017134,"2,453,235.00",13 Feb  2013
,15500097,LONDON BOROUGH OF CAMDEN,544075,Grants to External Organisations,5107795327,"1,829,793.00",14 Feb  2013
,18000092,WANDSWORTH COUNCIL,544077,HSG Grants to Local Authorities,1900017174,"1,814,500.00",20 Feb  2013
,18000010,NOTTING HILL HOUSING TRUST,544076,HSG Grants to Registered Providers,1900017201,"1,597,410.00",27 Feb  2013
,18000064,AFFINITY HOMES GROUP LIMITED,544076,HSG Grants to Registered Providers,1900017178,"1,584,000.00",22 Feb  2013
```



8. re

Regular Expressions (RegEx) je modul koji omogućava postavljanje regularnih izraza koji se koriste za potvrdu formata teksta.

➔ **Regularni izrazi**
Proveravanje sadržaja teksta.

➔ **Razne primene**
Lozinke, datumi, e-mail adrese, ...

Proveravanje ispravnosti e-mail-ova

```python
import re

#Check if the string starts with "The" and ends with "Spain":

txt = "The rain in Spain"
x = re.search("^The.*Spain$", txt)

if (x):
  print("YES! We have a match!")
else:
  print("No match")
```

Task	Text	Capture Groups	
Capture	tom@hogwarts.com	tom	✓
Capture	tom.riddle@hogwarts.com	tom.riddle	✓
Capture	tom.riddle+regexone@hogwarts.com	tom.riddle	✗
Capture	tom@hogwarts.eu.com	tom	✓
Capture	potter@hogwarts.com	potter	✓
Capture	harry@hogwarts.com	harry	✓
Capture	hermione+regexone@hogwarts.com	hermione	✗

`^([\w\.]+)(@)?([\w\.]+)` Continue ›

New User Signup

123

Username must be alphanumeric and contains 5 - 12 characters

the-boss@thenetninja.co.u

Email must be a valid address, e.g. me@mydomain.com

••••••••••

1234567890

Telephone must be a valid UK telephone number (11 digits)

thenetninja

Anchors	
^	Start of string, or start of line in multi-line pattern
\A	Start of string
$	End of string, or end of line in multi-line pattern
\Z	End of string
\b	Word boundary
\B	Not word boundary
\<	Start of word
\>	End of word

Character Classes	
\c	Control character
\s	White space
\S	Not white space

Assertions	
?=	Lookahead assertion
?!	Negative lookahead
?<=	Lookbehind assertion
?!= or ?<!	Negative lookbehind
?>	Once-only Subexpression
?()	Condition [if then]
?()|	Condition [if then else]
?#	Comment

Quantifiers			
*	0 or more	{3}	Exactly 3
+	1 or more	{3,}	3 or more
?	0 or 1	{3,5}	3, 4 or 5

Add a ? to a quantifier to make it ungreedy.

Groups and Ranges	
.	Any character except new line (\n)
(a|b)	a or b
(...)	Group
(?:...)	Passive (non-capturing) group
[abc]	Range (a or b or c)
[^abc]	Not (a or b or c)
[a-q]	Lower case letter from a to q
[A-Q]	Upper case letter from A to Q
[0-7]	Digit from 0 to 7
\x	Group/subpattern number "x"

Ranges are inclusive.

Pattern Modifiers	
g	Global match

Izbor je vaš!