MINISTERUL EDUCAȚIEI, CULTURII și CERCETĂRII al Rep. MOLDOVA
UNIVERSITATEA TEHNICĂ a MOLDOVEI
FACULTATEA CALCULATOARE, INFORMATICĂ și MICROELECTRONICĂ
Departamentul „Informatică și Ingineria Sistemelor”

LUCRARE INDIVIDUALĂ Nr.2
GRAFICA PE CALCULATOR

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CHIȘINĂU 2022

CUPRINS

					GC 21-102 Buza Cătălin	
Mo	*Coala*	*Nr. Document*	*Semn.*	*Data*		
Elaborat		*Buza Cătălin.*			**Lucrare independentă la disciplina:**	*Litera* / *Coala* / *Coli*
Verificat		*Malcoci*				*1* / **28**
						UTM
					Grafica pe calculator	*FCIM Gr. TI-214*

Exemple laborator 4

```
print("Ex4_1")
print ("Python" == "PYTHON")
print ("Python" != "PYTHON")
print ("PYTHON" != "PYTHON")
print (15 <= 14)
print (15 <= 15)

print("\nEx4_2")
print ("Welcome" != "WELCOME" and (7>5) and (4==4))
print ("Welcome" != "WELCOME" or (7>5) or (4==4))
print ("Welcome" == "WELCOME" and (7<5) and (4==4))
print ("Welcome" == "WELCOME" or (7<5) or (4==4))
print ("Welcome" == "WELCOME" or (7<5) and (4==4))
print ("Welcome" == "WELCOME" and (7<5) or (4==4))

print("\nEx4_3")
x = 15
y = 7
print ( x == y)
print ( x != y)
print ( x > y)
print ( x >= y)
print ( x == y and x != y)
print ( x == y or x != y)

print("\nEx4_4")
my_dict = {'key 1': 1, 'key 2': 7, 'key 3': 9}
new_list = []
x = list(my_dict.values())
for i in x:
    if i >= 5:
        new_list.append(i)
print(new_list)


print("\nEx4_5")
import random
a = random.randint(1,100)
```

```
b = int(input( " Alege un numar intre 1 si 100 : "))
print(f"\nNumarul a generat aleator este :{a}")
if (a > b) :
    print(f" Numarul a > b : {a} > {b} ")
elif (a<b) :
    print(f" Numarul a < b : {a} < {b} ")
else  :
    print(f" Numarul a = b : {a} = {b} ")

print("\nEx4_6")
num = float(input("Introduceti numarul : "))
if num>= 0:
    if num == 0: print("Zero")
    else: print("Numarul este pozitiv")
else: print("Numarul este negativ")

print("\nEx4_7")
b = int(input( " alege un numar intre 1 si 100 : "))
if (b%5==0) and (b%3!=0) : print(F"Numarul {b} este multipul lui
5 si 3  ")
else : print ("Conditiile nu se respecta ")

print("\nEx4_8")
nr = int(input("Introduceti numarul : "))
x = len(str(nr))
print(f"Nr ales de utilizator are {x} cifre")

print("\nEx4_9")
nr = int(input("Introduceti numarul : "))
if nr%2 == 0 :
    print ( "Numarul este par")
else:
    print(" Numarul este impar")

print("\nEx4_10")
my_dict = {'Ana': 11, 'Mariana': 40, 'Iulian': 41}
new_list = []
x = list(my_dict.values())
for i in x:
```

```
    if i >= 25:
        new_list.append(i)
print(new_list)

print("\nEx4_11")
print("\na)")
lista_mea = ['Ion','Ana','Maria']
for x in lista_mea:
    print(x)
    print('Salut')

print("\nb)")
lista_mea = ['Ion','Ana','Maria']
for x in lista_mea[:2]:
    print(x)
    print('Salut')

print("\nc)")
lista_mea = ['Ion','Ana','Maria']
for x in lista_mea:
    print(x)
print('Salut')

print("\nEx4_12")
print("a)")
lista_mea = ['Ion','Ana','Maria']
for x in 'Ana':
    print(x)

print("\nb)")
lista_mea = ['Ion','Ana','Maria']
for x in 'Ana':
    print(x,end = '')

print("\nEx4_13")
lista_mea = ['nokia', 'samsung', ' google','iphone']
i = 0
while i < len(lista_mea) :
    telefoane = lista_mea[i]
```

```
    i +=1
    if telefoane == 'google':
        continue
    print(telefoane)

print("\nEx4_14")
print("\na)")
for i in range(1,8):
    print(i)

print("\nb)")
i = 1
while i < 8:
    print(i)
    i +=1

print("\nEx4_15")
for i in  range(1,11):
    print('{} {} {}'.format(i , i**2 , i**3))

print("\nb)")
for i in  range(1,11):
    print('{0:2d} {1:3d} {2:4d}'.format(i , i**2 , i**3))

print("\nEx4_16")
print('*'*5, 'Arunca zarurile' , '*'*5 )
import random
import time
zar = 'y'
while (zar == 'y'):
    print(" Aruncam zarurile ")
    print("Zar1 indica : ", random.randint(1,6))
    print("Zar2  indica : ", random.randint(1,6))
    zar = input("Apasa tasta y pentru a arunca zarurile din nou :
")
    time.sleep(3)

print("\nEx4_17")
```

```
num = int(input("Alege un numar cuprins intre 1 si 9 :"))for i in
range(1 , 10) :
    print(F"{num} x {i} = {num*i}")

print("\nEx4_18")
a = int ( input( " intodu limita de jos :"))
b = int ( input( " intodu limita de sus :"))
my_list = list(range(a,b))
print(F"{my_list[0::2]}")

print("\nEx4_19")
for i in 'Dacia':
    if i == 'a':
        continue
    print(i)

print("\nEx4_20")
print("Introdu 4 valori pentru temp in grade C separate prin spatiu
")
Temp_C = [int(x) for x in input().split()]
Temp_F = [(9/5 *y +32) for y in Temp_C]
print("Temperatura in grade C si grade F\n",Temp_C,Temp_F)

print("\nEx4_21")
import string
import random
parola = int(input("Introdu lungimea parolei : "))
charactere    =    string.digits    +    string.ascii_letters    +
string.punctuation
PAROLA = " "
for i in range(0,parola):
    PAROLA = PAROLA + random.choice(charactere)
print(PAROLA)

print("\nEx4_22")
a = input("Cum te numesti si ce varsta ai :")
b = a.split()
b.sort()
for i in b:
```

```
     print(i)

print("\nEx4_23")
culori = ['Alb', 'Negru','Oranj']
auto = ['Duster','Logan','Dokker']
for i in culori:
    for q in auto :
        print(q,i)
print()
lista = [(q,i)for i in culori  for q in auto ]
print(lista)

print("\nEx4_24")
sir = input (" Introdu o propozitie: ")
litere_mari = 0
litere_mici = 0
for i in sir :
    if i.isupper():
        litere_mari = litere_mari + 1
    elif i.islower():
        litere_mici +=1
    else:
        pass
print(" Numarul de litere mari este : ", litere_mari)
print(" Numarul de litere mici este : ", litere_mici)

print("\nEx4_25")
x_min = int(input("Introdu limita de jos incepand cu 100 : "))
x_max = int(input("Introdu limita de care nu depaseste 999 : "))
numere_pare = []
for i in range (x_min,x_max):
    s =str(i)
    if int(s[0])%2==0  and int(s[1])%2==0 and int(s[2])%2==0 :
        numere_pare.append(s)
print(numere_pare)

print("\nEx4_26")
import time
film = input("Care este filmul tau preferat ? : ")
```

```
while True:
    print(film,'este un film SUPER !!!')
    time.sleep(5)

print("\nEx4_27")
while True:
    parola = input ("Introdu parola : ")
    if len(parola)>= 10 and any(i.isdigit() for i in parola) and
any(i.isupper() for i in parola):
        print("Parola noua a fost salvata cu succes")
        break
else:
    print("Parola nu are 10 caractere , o cifra sau majuscula !!!")
```

Rezultatul

```
PS C:\Users\Lenovo> & C:/Users/Lenovo,
Ex4_1
False
True
False
False
True

Ex4_2
True
True
False
True
False
True

Ex4_3
False
True
True
True
False
True

Ex4_4
[7, 9]

Ex4_5
 Alege un numar intre 1 si 100 : 4

Numarul a generat aleator este :83
```

```
Ex4_5
 Alege un numar intre 1 si 100 : 4

Numarul a generat aleator este :83
 Numarul a > b : 83 > 4

Ex4_6
Introduceti numarul : 4
Numarul este pozitiv

Ex4_7
 alege un numar intre 1 si 100 : 4
Conditiile nu se respecta

Ex4_8
Introduceti numarul : 4
Nr ales de utilizator are 1 cifre

Ex4_9
Introduceti numarul : 4
Numarul este par

Ex4_10
[40, 41]

Ex4_11

a)
Ion
Salut
Ana
Salut
Maria
Salut

b)
Ion
Salut
Ana
Salut
```

```
Ana
Salut

c)
Ion
Ana
Maria
Salut

Ex4_12
a)
A
n
a

b)
Ana
Ex4_13
nokia
samsung
 google
iphone

Ex4_14

a)
1
2
3
4
5
6
7

b)
1
2
3
4
5
6
```

```
5
6
7

Ex4_15
1 1 1
2 4 8
3 9 27
4 16 64
5 25 125
6 36 216
7 49 343
8 64 512
9 81 729
10 100 1000

b)
 1   1    1
 2   4    8
 3   9   27
 4  16   64
 5  25  125
 6  36  216
 7  49  343
 8  64  512
 9  81  729
10 100 1000

Ex4_16
***** Arunca zarurile *****
 Aruncam zarurile
Zar1 indica :  4
Zar2  indica :  2
Apasa tasta y pentru a arunca zarurile din nou : y
 Aruncam zarurile
Zar1 indica :  5
Zar2  indica :  3
Apasa tasta y pentru a arunca zarurile din nou : y
 Aruncam zarurile
Zar1 indica :  5
Zar2  indica :  3
```

```
 Aruncam zarurile
Zar1 indica :  5
Zar2  indica :  3
Apasa tasta y pentru a arunca zarurile din nou : gata

Ex4_17
Alege un numar cuprins intre 1 si 9 :9
9 x 1 = 9
9 x 2 = 18
9 x 3 = 27
9 x 4 = 36
9 x 5 = 45
9 x 6 = 54
9 x 7 = 63
9 x 8 = 72
9 x 9 = 81

Ex4_18
 intodu limita de jos :0
 intodu limita de sus :9
[0, 2, 4, 6, 8]

Ex4_19
D
c
i

Ex4_20
Introdu 4 valori pentru temp in grade C separate prin spatiu
20 40 60 80
Temperatura in grade C si grade F
 [20, 40, 60, 80] [68.0, 104.0, 140.0, 176.0]

Ex4_21
Introdu lungimea parolei : 8
 KDvg-t]c

Ex4_22
Cum te numesti si ce varsta ai :Ma numesc Catalin si am 20 de ani din pacate
20
Catalin
Ma
am
ani
de
din
numesc
pacate
si

Ex4_23
Duster Alb
Logan Alb
Dokker Alb
Duster Negru
Logan Negru
Dokker Negru
Duster Oranj
Logan Oranj
Dokker Oranj

[('Duster', 'Alb'), ('Logan', 'Alb'), ('Dokker', 'Alb'), ('Duster', 'Negru'), ('Logan', 'Negru'), ('Dokker', 'Negru'), ('Duster', 'Oranj'), ('Logan', 'Oranj'), ('Dokker', 'Oranj')]

Ex4_24
 Introdu o propozitie: Salutare Ce mai faci
 Numarul de litere mari este :  2
 Numarul de litere mici este :  15
```

```
Ex4_25
Introdu limita de jos incepand cu 100 : 100
Introdu limita de care nu depaseste 999 : 210
['200', '202', '204', '206', '208']
```

```
Ex4_26
Care este filmul tau preferat ? : Yugioh 5ds  Bonds Beyound The time
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Yugioh 5ds  Bonds Beyound The time este un film SUPER !!!
Traceback (most recent call last):
  File "c:\Users\Lenovo\Desktop\Lab4LI.py", line 258, in <module>
    time.sleep(5)
KeyboardInterrupt
PS C:\Users\Lenovo>
```

```
Ex4_27
Introdu parola : HiIlovePython3.10
Parola noua a fost salvata cu succes
PS C:\Users\Lenovo>
```

Exemple Laboratorul 5

```
print("Ex5_1")
a=int(input("Introduceti numarul dorit:"))
b=lambda a:a**2
print(f"Patratul numarului {a} este {b(a)}")

print("\nEx5_2")
a=int(input("Introduceti primul numar:a="))
b=int(input("Introduceti primul numar:b="))
def f(a,b):
    print(f"Suma a+b={a+b},Produsul a*b={a*b}")
    print(f"Suma {a}+{b}={a+b},Produsul {a}*{b}={a*b}")
f(a,b)

print("\nEx5_3")
a=int(input("Introduceti primul numar:a="))
b=int(input("Introduceti primul numar:b="))
c=lambda a,b:a+b
d=lambda a,b:a*b
print(f"Suma a+b={c(a,b)},Produsul a*b={d(a,b)}")
print(f"Suma {a}+{b}={c(a,b)},Produsul {a}*{b}={d(a,b)}")

print("\nEx5_4")
a=int(input("Doriti sa determinati factorialul numarului :"))
b=1
def factorial(a,b):
    for i in range(1,a+1):
        b=b*i
    return b
c=factorial(a,b)
print(f"Factorialul lui {a} este {c}")

print("\nEx5_5")
lista_mea=list(range(-7,8))
lista_noua=[]
for i in lista_mea:
```

```
    i=i**3
    lista_noua.append(i)
print(lista_noua)

print("\nEx5_6")
def patrat(x):
    return x*x
numere=list(range(-5,6))
patr=[]

for i in numere:
    a=lambda i:patrat(i)
    i=a(i)
    patr.append(i)
print(patr[:])

print("\nEx5_7")
a=int(input("Introduceti raza cercului:"))
b=lambda a:a*2
print(f"Diametrul cercului cu raza {a} este {b(a)}")
c=lambda c:2*3.14*a
print(f"Lungimea cercului cu raza {a} este {c(a)}")
d=lambda d:3.14*a*a
print(f"Aria cercului cu raza {a} este {d(a)}")

print("\nEx.5_8")
a=int(input("Introduceti limita minima(nr.negativ):"))
b=int(input("Introduceti limita maxima (nr.pozitiv):"))
lista_initiala=list(range(a,b))
lista_para=filter(lambda d:d%2==0 and d>0, lista_initiala)
print(list(lista_para))

print("\nEx5_9")
lista_initiala=[-1,2,45,20,-23,17,-3,9,-5,6,32,-14,14,17,12,-
20,11,8]
lista_negativa_impara=filter(lambda     a:a%2!=0     and     a<0,
lista_initiala)
print(f"Nr negative/impare:{list(lista_negativa_impara)}")
lista_20_20=filter(lambda b:b>-20 and b<20,lista_initiala)
```

```
print(f"Numerele intre -20 si 20 :{list(lista_20_20)}")

print("Ex5_10")
import numpy as np
a=np.array(((3,9),(8,5)))
b=np.array(((2,3),(1,7)))
c=a+b
print("Suma matricelor x+y=")
print(c)
d=a-b
print("Diferenta matricelor x-y=")
print(d)
e=a*b
print("Produsul matricelor x*y=")
print(e)
f=a/b
print("Impartirea matricelor x/y=")
print(f)
print("Transpusa matricei x=")
print(a.transpose())
g=np.linalg.inv(b)
print("Inversa matricei y=")
print(g)

print("\nEx5_11")
print("a)")
def suma(x=4,y=-2):
    return x+y
print(suma())

print("b)")
def suma(x=4,y=-2):
    return x+y
print(suma(5,-5))

print("\nEx5_12")
a=int(input("Introdu limita de jos :"))
b=int(input("Introdu limita de sus :"))
lista=list(range(a,b))
```

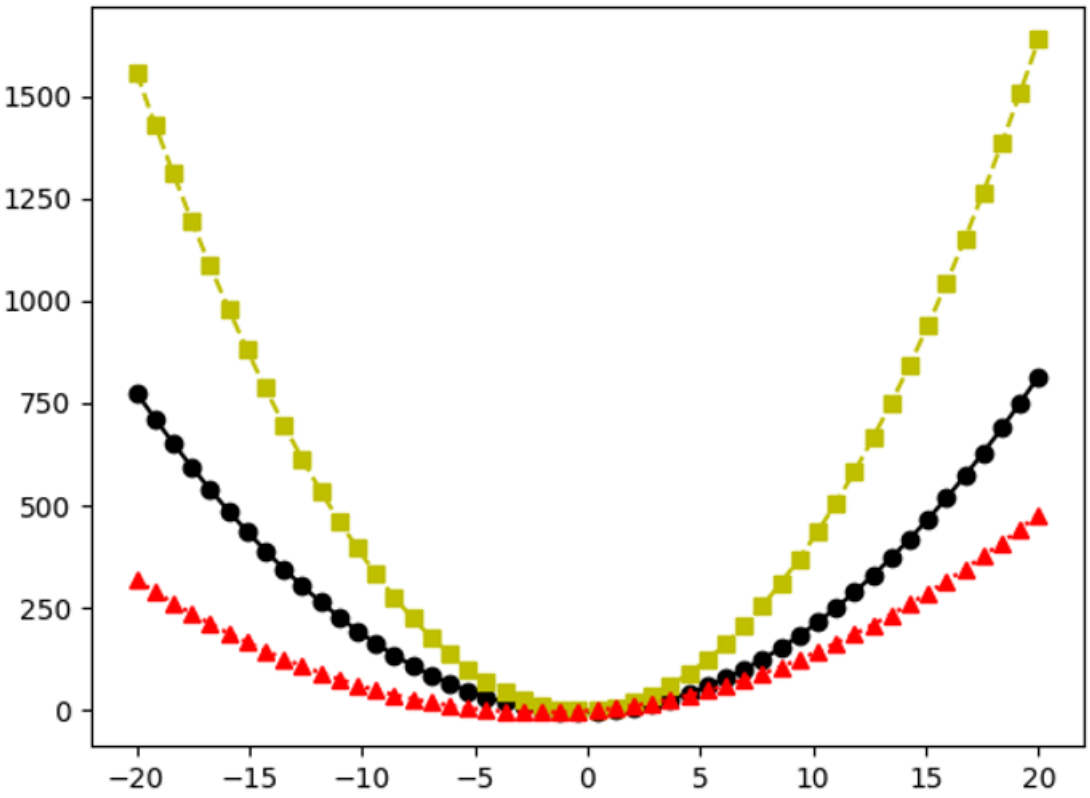
```
lista_mea=filter(lambda c:c%4==0 and c%3!=0,lista)
print(list(lista_mea))

def sortare (lista1):
    lista2=filter(lambda c:c%4==0 and c%3!=0,lista1)
    print(list(lista2))
sortare(lista)

print("\nEx5_13")
import matplotlib.pyplot as myplt
import numpy as np
x=np.linspace(-20,20,num=50)
def y1(x):
    return 2*x*x+x-4
def y2(x):
    return 4*x*x+2*x-1
def y3(x):
    return x*x+4*x-2
ylist1=y1(x)
ylist2=y2(x)
ylist3=y3(x)
myplt.figure(1)
myplt.plot(x,ylist1,"-k",marker="o")
myplt.plot(x,ylist2,"--y",marker="s")
myplt.plot(x,ylist1,":r",marker="^")
myplt.show()

print("\nEx5_14")
import matplotlib.pyplot as myplt
import numpy as np
x=np.linspace(-10,10,num=30)
def func1(x):
    return 2*x*x+x-4
def func2(x):
    return 4*x*x+2*x-1
def func3(x):
    return x*x+4*x-2
ylist1=func1(x)
ylist2=func2(x)
```

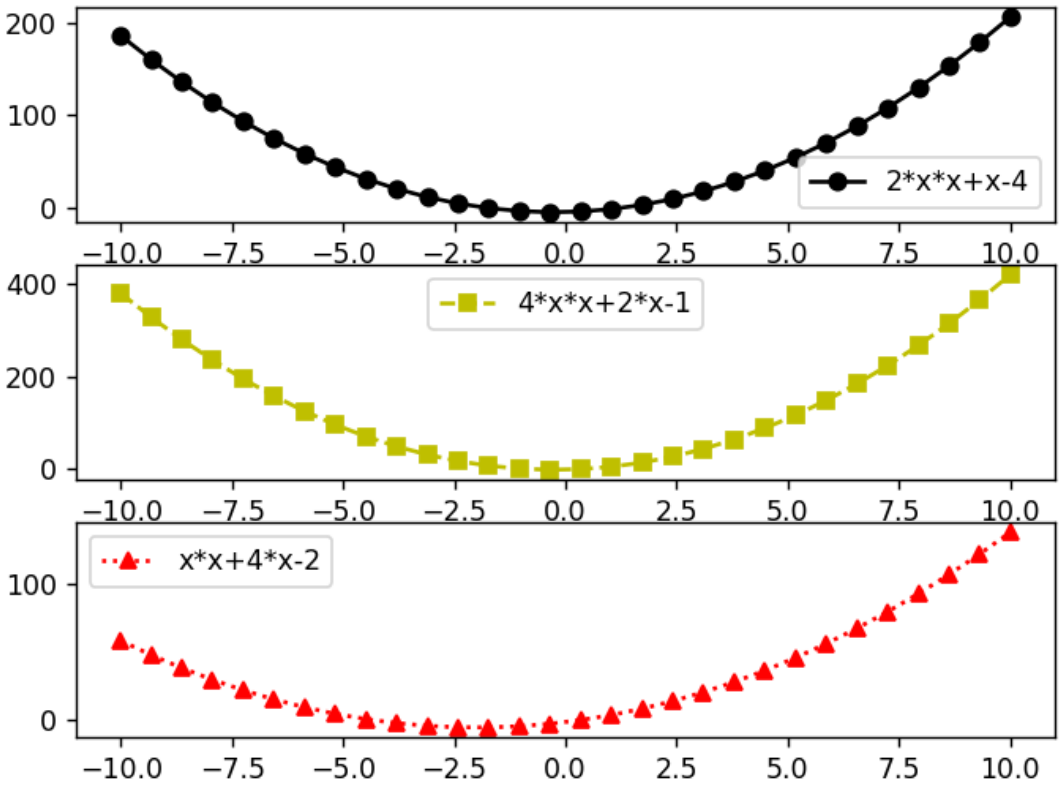
```
ylist3=func3(x)
fig,(func1,func2,func3)=myplt.subplots(nrows=3,ncols=1)
func1.plot(x,ylist1,"-k",marker="o",label='2*x*x+x-4')
func1.legend()
func2.plot(x,ylist2,"--y",marker="s",label='4*x*x+2*x-1')
func2.legend()
func3.plot(x,ylist3,":r",marker="^",label='x*x+4*x-2')
func3.legend()
myplt.show()
```

Rezultatele

```
Ex5_1
Introduceti numarul dorit:3
Patratul numarului 3 este 9

Ex5_2
Introduceti primul numar:a=4
Introduceti primul numar:b=6
Suma a+b=10,Produsul a*b=24
Suma 4+6=10,Produsul 4*6=24

Ex5_3
Introduceti primul numar:a=4
Introduceti primul numar:b=7
Suma a+b=11,Produsul a*b=28
Suma 4+7=11,Produsul 4*7=28

Ex5_4
Doriti sa determinati factorialul numarului :4
Factorialul lui 4 este 24

Ex5_5
[-343, -216, -125, -64, -27, -8, -1, 0, 1, 8, 27, 64, 125, 216, 343]

Ex5_6
[25, 16, 9, 4, 1, 0, 1, 4, 9, 16, 25]

Ex5_7
Introduceti raza cercului:10
Diametrul cercului cu raza 10 este 20
Lungimea cercului cu raza 10 este 62.800000000000004
Aria cercului cu raza 10 este 314.0
```

```
Ex.5_8
Introduceti limita minima(nr.negativ):-10
Introduceti limita maxima (nr.pozitiv):10
[2, 4, 6, 8]

Ex5_9
Nr negative/impare:[-1, -23, -3, -5]
Numerele intre -20 si 20 :[-1, 2, 17, -3, 9, -5, 6, -14, 14, 17, 12, 11, 8]
Ex5_10
Suma matricelor x+y=
[[ 5 12]
 [ 9 12]]
Diferenta matricelor x-y=
[[ 1  6]
 [ 7 -2]]
Produsul matricelor x*y=
[[ 6 27]
 [ 8 35]]
Impartirea matricelor x/y=
[[1.5        3.        ]
 [8.         0.71428571]]
Transpusa matricei x=
[[3 8]
 [9 5]]
Inversa matricei y=
[[ 0.63636364 -0.27272727]
 [-0.09090909  0.18181818]]

Ex5 11
Ex5_11
a)
2
b)
0

Ex5_12
Introdu limita de jos :0
Introdu limita de sus :16
[4, 8]
[4, 8]

Ex5_13

Ex5_14
```


1500
1250
1000
750
500
250
0
−20
−15
−10
−5
0
5
10
15
20


200
100
0
2*x*x+x-4
−10.0
−7.5
−5.0
−2.5
0.0
2.5
5.0
7.5
10.0
400
200
0
4*x*x+2*x-1
100
0
x*x+4*x-2

Exemple din modulul turtle

Exemplul 1

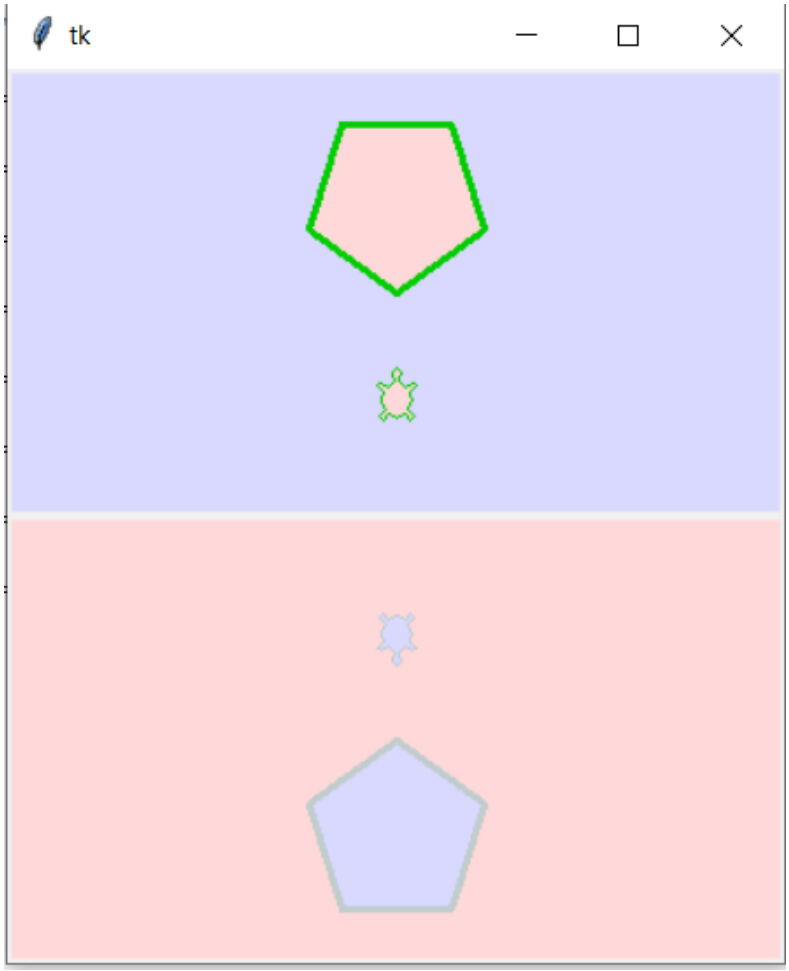
```
from turtle import *
def main():
   peacecolors = ("red3",  "orange", "yellow",
                  "seagreen4", "orchid4",
                  "royalblue3", "dodgerblue3")
  reset()
   Screen()
   up()
   goto(-320,-195)
   width(70)

   for pcolor in peacecolors:
      color(pcolor)
      down()
      forward(600)
      up()
      backward(600)
      left(90)
      forward(60)
      right(90)
   width(25)
   color("black")
   goto(0,-170)
   down()
   circle(170)
   left(90)
   forward(340)
   up()
   left(180)
```

```
    forward(170)
    right(45)
    down()
    forward(170)
    up()
    backward(170)
    left(90)
    down()
    forward(170)
    up()
    goto(0,300) # vanish if hideturtle() is not available ;-)
    return "Done!"
if __name__ == "__main__":
    main()
    mainloop()
```

Exemplul 2

```
from turtle import TurtleScreen, RawTurtle, TK
def main():
    root = TK.Tk()
    cv1 = TK.Canvas(root, width=350, height=200, bg="#ddffff")
    cv2 = TK.Canvas(root, width=350, height=200, bg="#ffeeee")
    cv1.pack()
    cv2.pack()
    s1 = TurtleScreen(cv1)
    s1.bgcolor(0.85, 0.85, 1)
    s2 = TurtleScreen(cv2)
    s2.bgcolor(1, 0.85, 0.85)
    p = RawTurtle(s1)
    q = RawTurtle(s2)
    p.color("green3", (1, 0.85, 0.85))
    p.width(3)
    q.color("azure3", (0.85, 0.85, 1))
    q.width(3)

for t in p,q:
        t.shape("turtle")
        t.lt(36)

    q.lt(180)
    for t in p, q:
        t.begin_fill()
    for i in range(5):
        for t in p, q:
            t.fd(50)
            t.lt(72)
    for t in p,q:
        t.end_fill()
```

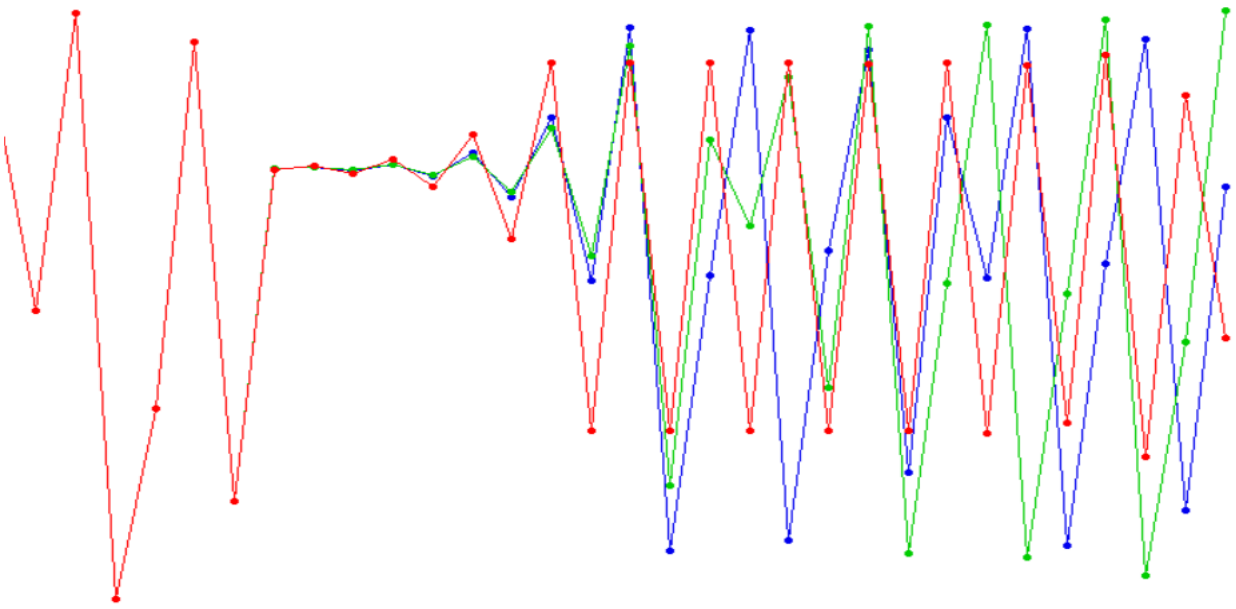
```
        t.lt(54)
        t.pu()
        t.bk(50)

    return "EVENTLOOP"
if __name__ == '__main__':
    main()
    TK.mainloop()
```



Exemplul 3

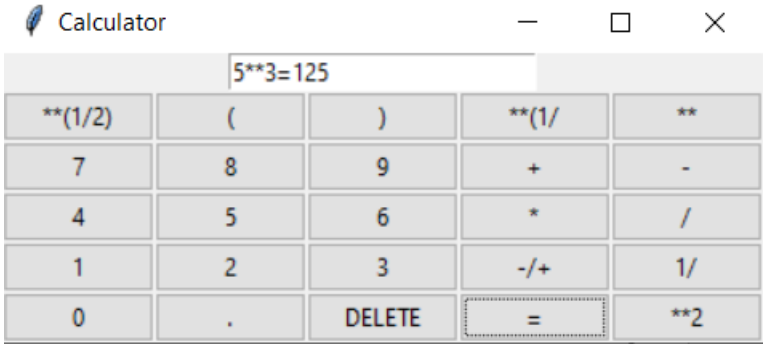
```
from turtle import *
N = 80
def f(x):
    return 3.9*x*(1-x)
def g(x):
    return 3.9*(x-x**2)
def h(x):
    return 3.9*x-3.9*x*x
def jumpto(x, y):
    penup(); goto(x,y)
def line(x1, y1, x2, y2):
    jumpto(x1, y1)
    pendown()
    goto(x2, y2)
def coosys():
    line(-1, 0, N+1, 0)
    line(0, -0.1, 0, 1.1)
def plot(fun, start, color):
    pencolor(color)
    x = start
    jumpto(0, x)
    pendown()
    dot(5)
    for i in range(N):
        x=fun(x)
        goto(i+1,x)
        dot(5)

def main():
```

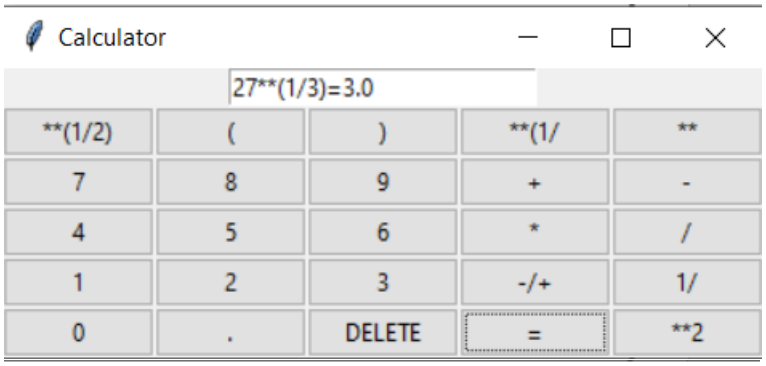
```
    reset()
    setworldcoordinates(-1.0,-0.1, N+1, 1.1)
    speed(0)
    hideturtle()
    coosys()
    plot(f, 0.35, "blue2")
    plot(g, 0.35, "green3")
    plot(h, 0.35, "red1")
    # Now zoom in:
    for s in range(100):
        setworldcoordinates(0.5*s,-0.1, N+1, 1.1)
    return "Done!"
if __name__ == "__main__":
    main()
    mainloop()
```

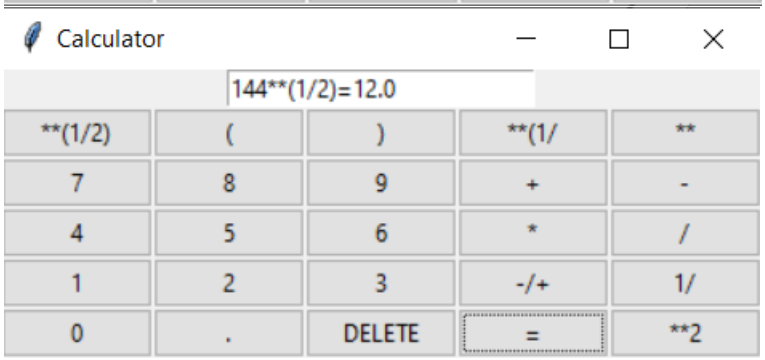


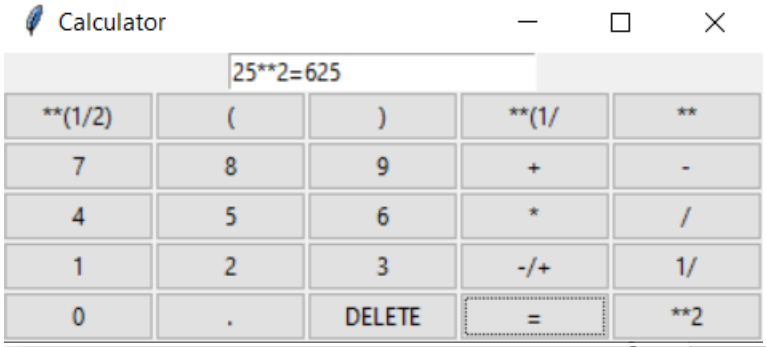
```
from tkinter import *
from tkinter import messagebox # mesaje
from tkinter import ttk #butoane

window=Tk()
window.title('Calculator')
butoane_calc=[
              "**(1/2)","(",")","**(1/","**", #**(1/2)-radical de
ordinul 2
              "7","8","9","+","-",              #**(1/-radical de
ordinul n
            "4","5","6","*","/",             #** x la puterea y
           "1","2","3","-/+","1/",          #1/ --1/x=inversul lui
x
             "0",".","DELETE","=","**2"       #**2-ridicarea la
patrat
]

r=1
c=0
calc_txt=Entry(window,width=25)
calc_txt.grid(row=0,column=0,columnspan=5)
def calc(key):
    global memory
    if key == "=":
        str1="**.+-()*/0123456789"
        if calc_txt.get() [0] not in str1:
            calc_txt.insert(END,"Nu este cifra")
            messagebox.showerror("ERROR!!!Not Number")
        try:
            rezultat=eval(calc_txt.get())
            calc_txt.insert(END,"=" + str(rezultat))
        except:
            calc_txt.insert(END,"ERROR!!!")
            messagebox.showerror("Verifica valorile introduse")
    elif key =="DELETE":
        calc_txt.delete(0,END)
    elif key=="-/+":
```

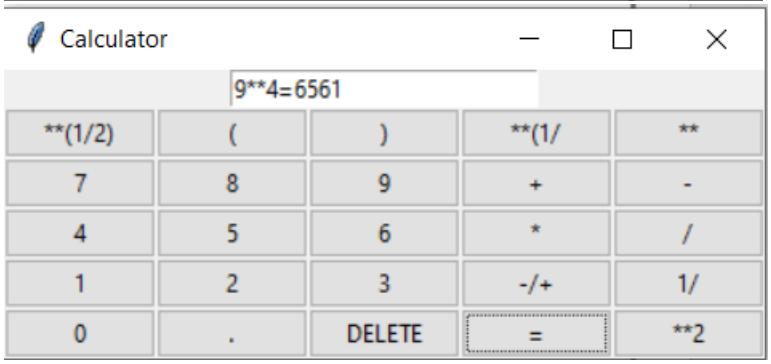
```
            if "=" in calc_txt.get():
                calc_txt.delete(0,END)
            try:
                if calc_txt.get()[0]=="-":
                    calc_txt.delete(0)
                else:
                    calc_txt.insert(0,"-")
            except IndexError:
                pass
        else:
            if "=" in calc_txt.get():
                calc_txt.delete(0,END)
            calc_txt.insert(END,key)

for i in butoane_calc:
    rel=""
    cmd=lambda x=i:calc(x)
    ttk.Button(window,text=i,command=cmd).grid(row=r,column=c)
    c+=1
    if c>4:
        c=0
        r+=1

window.mainloop()
```




Calculator
27**(1/3)=3.0
**(1/2)
(
)
**(1/
**
7
8
9
+
-
4
5
6
*
/
1
2
3
-/+
1/
0
.
DELETE
=
**2


Calculator
144**(1/2)=12.0
**(1/2)
(
)
**(1/
**
7
8
9
+
-
4
5
6
*
/
1
2
3
-/+
1/
0
.
DELETE
=
**2


Calculator
25**2=625
**(1/2)
(
)
**(1/
**
7
8
9
+
-
4
5
6
*
/
1
2
3
-/+
1/
0
.
DELETE
=
**2


Calculator
9**4=6561
**(1/2)
(
)
**(1/
**
7
8
9
+
-
4
5
6
*
/
1
2
3
-/+
1/
0
.
DELETE
=
**2