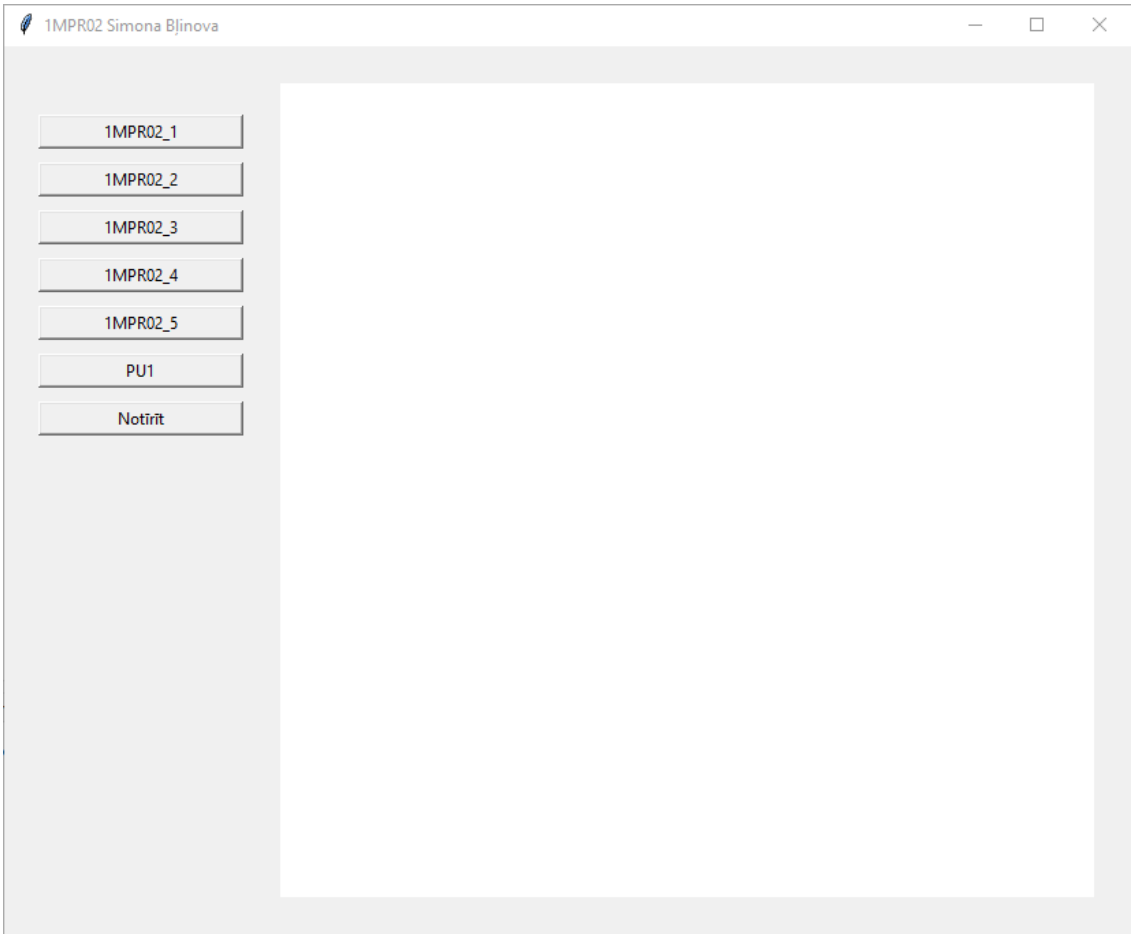
1MPR02_Simona_Bļinova sb24037

Visiem uzdevumiem lietota viena grafiskā saskarne.



Kods grafiskai saskarnei un funkcija zīmējumu notīrīšanai:

```
import tkinter as tk
import math

def notirit():
    kanva.delete('all')

logs = tk.Tk()
logs.geometry('825x650')
logs.title('1MPR02 Simona Bļinova')

kanva = tk.Canvas(logs, background='white')
kanva.place(x=200, y=25, height=600, width=600)

b1 = tk.Button(logs, text='1MPR02_1', command=mpr1)
b1.place(x=25, y=50, height=25, width=150)
```

```
b2 = tk.Button(logs, text='1MPR02_2', command=mpr2)
b2.place(x=25, y=85, height=25, width=150)

b3 = tk.Button(logs, text='1MPR02_3', command=mpr3)
b3.place(x=25, y=120, height=25, width=150)

b4 = tk.Button(logs, text='1MPR02_4', command=mpr4)
b4.place(x=25, y=155, height=25, width=150)

b5 = tk.Button(logs, text='1MPR02_5', command=mpr5)
b5.place(x=25, y=190, height=25, width=150)

b6 = tk.Button(logs, text='PU1', command=pu1)
b6.place(x=25, y=225, height=25, width=150)

bnotirit = tk.Button(logs, text='Notīrīt', command=notirit)
bnotirit.place(x=25, y=260, height=25, width=150)

logs.mainloop()
```

1.uzdevums

Programma, kas zīme riņķu zīmējumu ar rekursiju.

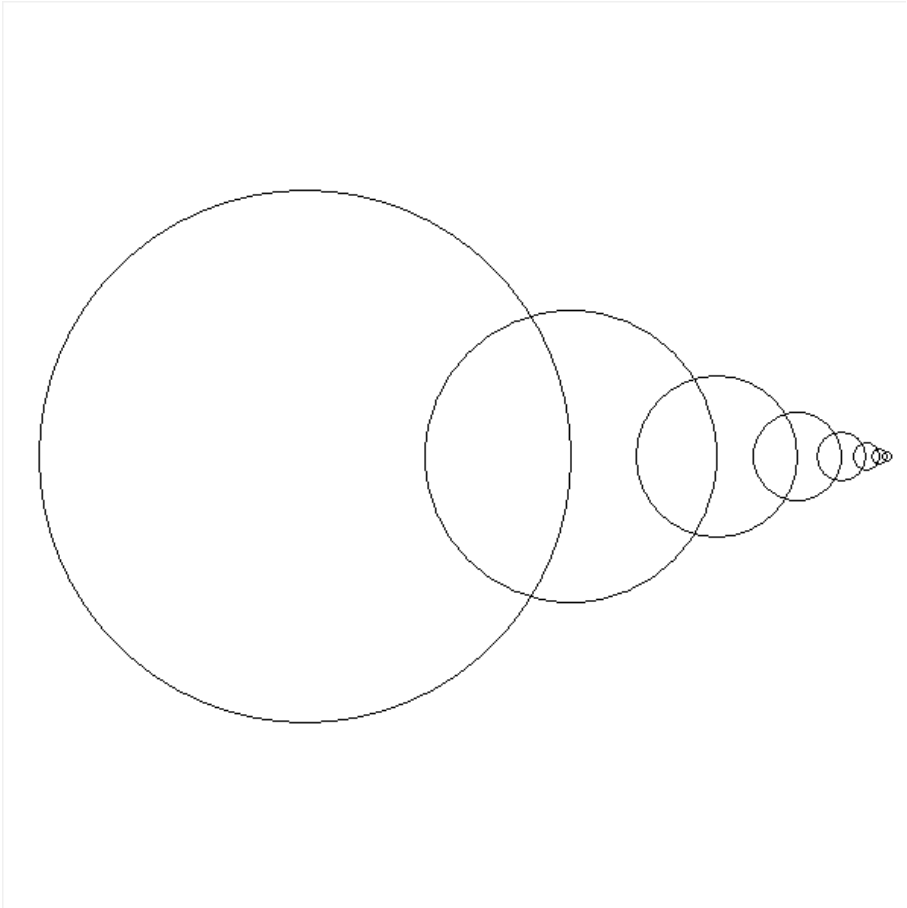
Kods:

```
def mpr1():
    x = 200
    y = 300
    r = 175
    rinki1(x, y, r)

def rinkis(x, y, r):
    kanva.create_oval(x-r, y-r, x+r, y+r)

def rinki1(x, y, r):
    rinkis(x, y, r)
    if r > 3:
        rinki1(x+r, y, r*0.55)
```

Testa piemērs(1)



2.uzdevums

Programma, kas zīme otro riņķu zīmējumu ar rekursiju.

Kods:

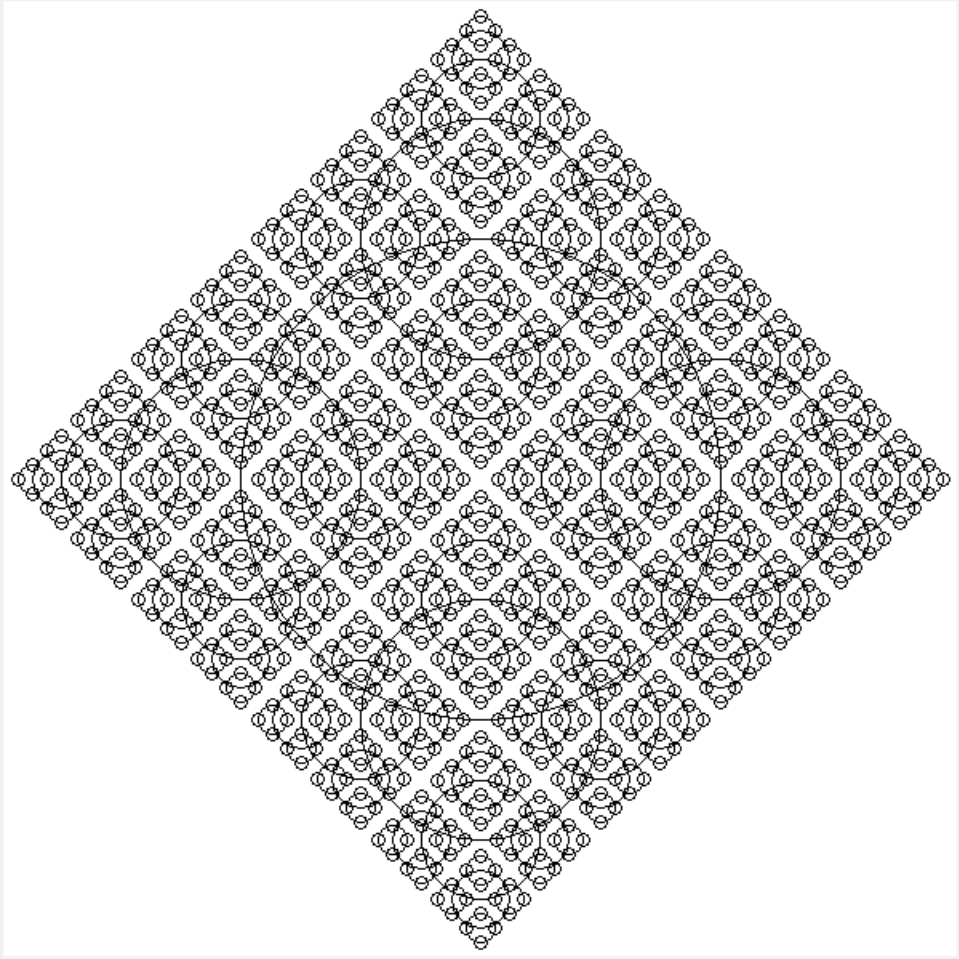
```
def mpr2():
    x = 300
    y = 300
    r = 150
    rinki2(x, y, r)

def rinkis(x, y, r):
    kanva.create_oval(x-r, y-r, x+r, y+r)

def rinki2(x, y, r):
    rinkis(x, y, r)
    if r > 5:
        rinki2(x-r, y, r//2)
        rinki2(x+r, y, r//2)
        rinki2(x, y-r, r//2)
```

```
    rinki2(x, y+r, r//2)
```

Testa piemērs(1)



3.uzdevums

Programma, kas zīme trešo riņķu zīmējumu ar rekursiju.

Kods:

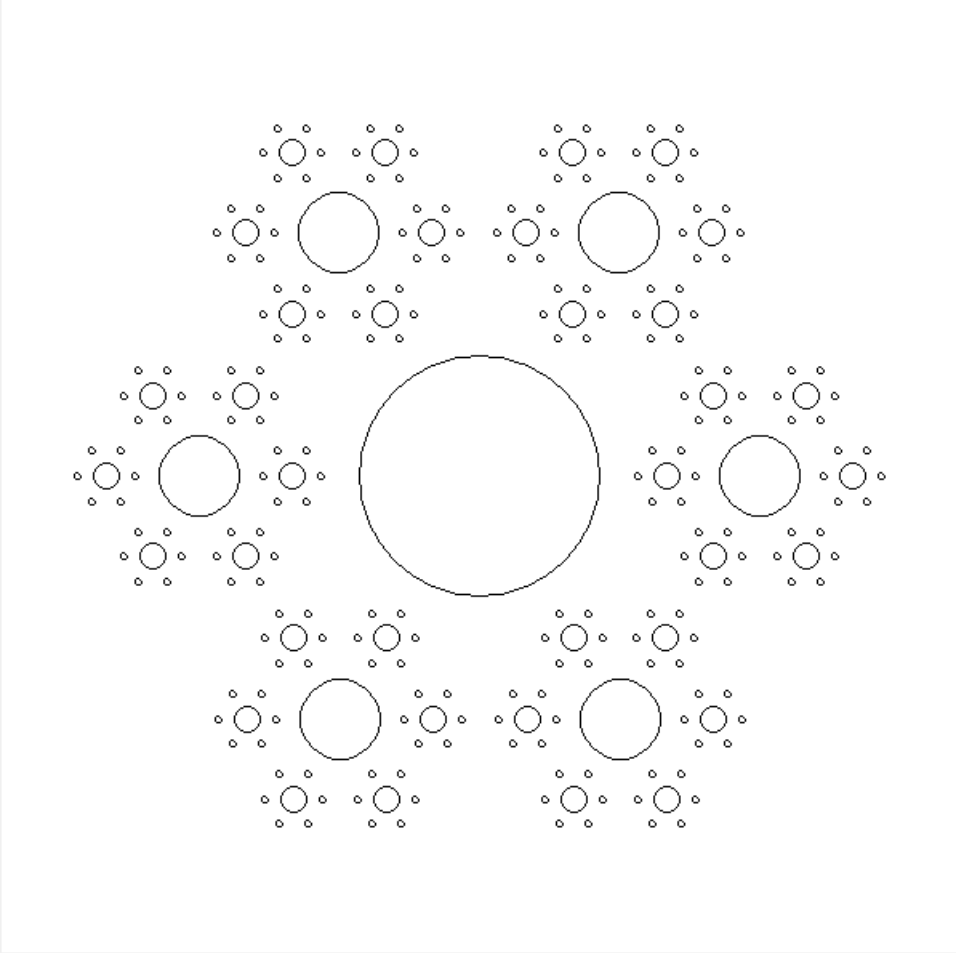
```
def mpr3():
    x = 300
    y = 300
    r = 75
    rinki3(x, y, r)

def rinkis(x, y, r):
    kanva.create_oval(x-r, y-r, x+r, y+r)

def rinki3(x, y, r):
    rinkis(x, y, r)
    if r > 5:
```

```
    mazais_r = r // 3
    for i in range(6):
        lenkis = (math.pi / 3) * i
        x2 = x + (2*r+mazais_r) * math.cos(lenkis)
        y2 = y + (2*r+mazais_r) * math.sin(lenkis)
        rinki3(x2, y2, mazais_r)
```

Testa piemērs(1)



4.uzedvums

Programma, kas zīme Pitagora koku.

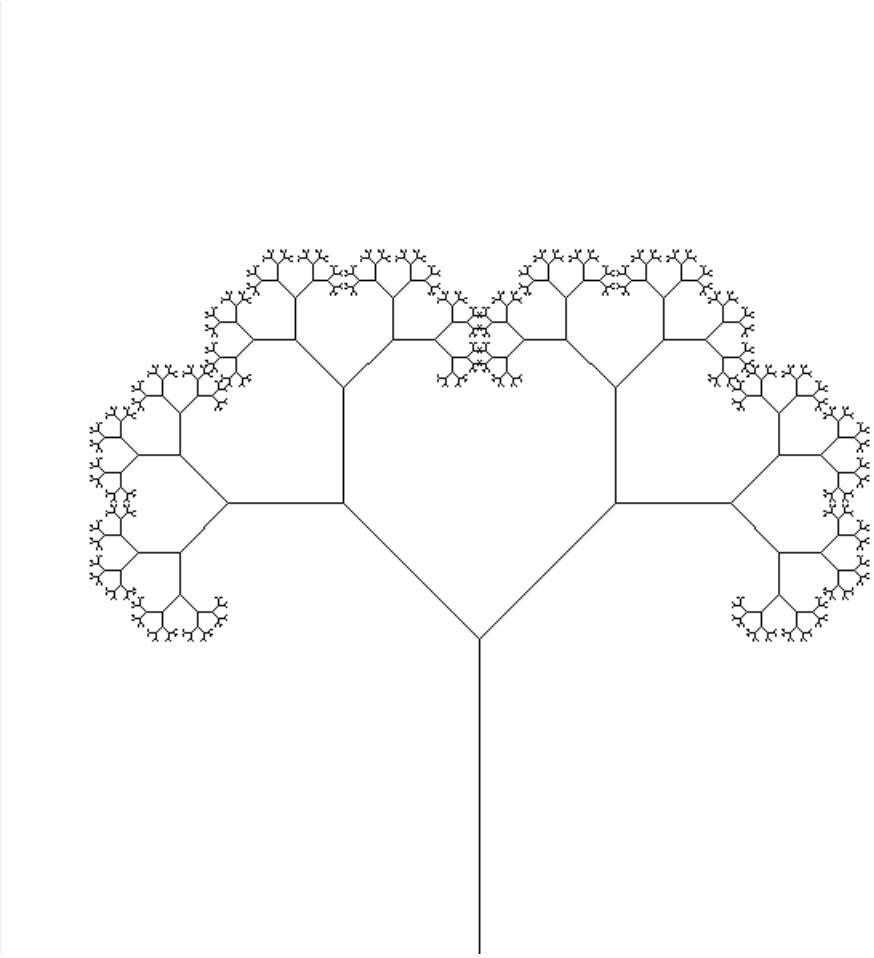
Kods:

```
def mpr4():
    x = 300
    y = 600
    garums = 200
    lenkis = math.pi / 2
    linijas(x, y, garums, lenkis)
```

```
def linijas(x, y, garums, lenkis):
    x2, y2 = linija(x, y, garums, lenkis)
    if garums > 2:
        linijas(x2, y2, garums*0.6, lenkis + math.pi / 4)
        linijas(x2, y2, garums*0.6, lenkis - math.pi / 4)

def linija(x, y, garums, lenkis):
    x_beigu = x-garums*math.cos(lenkis)
    y_beigu = y-garums*math.sin(lenkis)
    kanva.create_line(x, y, x_beigu, y_beigu)
    return x_beigu, y_beigu
```

Testa piemērs(1)



5.uzdevums

Programma, kas zīme Serpinska trijstūri.

Kods:

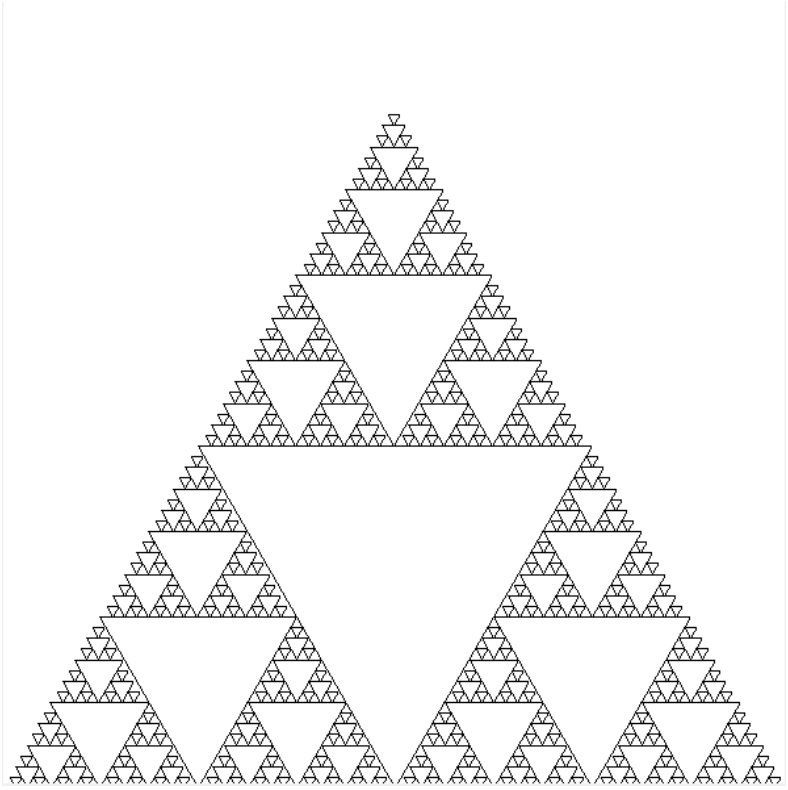
```
def mpr5():
    x = 300
    y = 600
```

```
    garums = 300
    lenkis = math.pi / 3
    trijsturi(x, y, garums, lenkis)

def linija(x, y, garums, lenkis):
    x_beigu = x-garums*math.cos(lenkis)
    y_beigu = y-garums*math.sin(lenkis)
    kanva.create_line(x, y, x_beigu, y_beigu)
    return x_beigu, y_beigu

def trijsturi(x, y, garums, lenkis):
    x1, y1 = linija(x, y, garums, lenkis)
    x2, y2 = linija(x, y, garums, lenkis*2)
    kanva.create_line(x1, y1, x2, y2)
    if garums > 10:
        x_jaunais = (x1 + x2) // 2
        y_jaunais = (y1 + y2) // 2
        jaunais_garums = garums // 2
        trijsturi(x-jaunais_garums, y, jaunais_garums, lenkis)
        trijsturi(x+jaunais_garums, y, jaunais_garums, lenkis)
        trijsturi(x_jaunais, y_jaunais, jaunais_garums, lenkis)
```

Testa piemērs(1)



PU1

Programma, kas zīme zīmējumu ar rekursiju.

Kods:

```
def pu1():
    x=300
    y=600
    garums = 300
    lenkis = math.pi / 2
    linijas2(x, y, garums, lenkis)

def linija(x, y, garums, lenkis):
    x_beigu = x-garums*math.cos(lenkis)
    y_beigu = y-garums*math.sin(lenkis)
    kanva.create_line(x, y, x_beigu, y_beigu)
    return x_beigu, y_beigu

def linijas2(x, y, garums, lenkis):
    x2, y2 = linija(x, y, garums, lenkis)
    if garums > 25:
        linijas2(x2, y2, garums//2, lenkis - math.pi / 4)
        linijas2(x2, y2, garums//2, lenkis + math.pi / 4)
        linijas2(x2, y2, garums//2, lenkis - math.pi / 4 * 3)
        linijas2(x2, y2, garums//2, lenkis + math.pi / 4 * 3)
```

Testa piemērs(1)