

Zadatak 1

Zid

```
import turtle
import math
turtle.color("black", "red")
turtle.shape("turtle")
turtle.speed(0)

for q in range(3):
    for p in range(2):
        for j in range(5):
            turtle.begin_fill()
            for i in range(4):
                if i%2==0:
                    turtle.forward(60)
                else:
                    turtle.forward(40)
                    turtle.left(360/4)
            turtle.end_fill()

            turtle.penup()
            turtle.forward(60)
            turtle.pendown()

            turtle.right(180)
            turtle.penup()
            turtle.forward(30)
            turtle.pendown()

            turtle.right(90)
            turtle.penup()
            turtle.forward(80)
            turtle.left(90)
            turtle.pendown()
```

Zadatak 2

Kružnice

```
import turtle
import math
turtle.color("black", "red")
turtle.shape("turtle")
turtle.speed(0)

turtle.left(90)
```

```

poluprecnik = 15
for j in range (10):
    for i in range(30):
        if j%2==0:
            turtle.begin_fill()
            turtle.forward(2*poluprecnik*math.pi/30)
            turtle.left(360/30)
        turtle.end_fill()

    poluprecnik = 15 + (j+1)*3 # Izracunat poluprecnik sledece kruznice
    turtle.right(90)
    turtle.penup()
    turtle.forward(2*poluprecnik)
    turtle.left(90)
    turtle.pendown()

```

Zadatak 3

Meda

```

import math
import pygame as pg
import pygamebg

(sirina, visina) = (700, 600) # otvaramo prozor
prozor = pygamebg.open_window(sirina, visina, "Meda")

# bojimo pozadinu u zeleno
prozor.fill(pg.Color("white"))

# crtamo usi
pg.draw.circle(prozor, pg.Color("yellow"), (200, 100),100)
pg.draw.circle(prozor, pg.Color("black"), (200, 100), 100,1)
pg.draw.circle(prozor, pg.Color("yellow"), (500, 100),100)
pg.draw.circle(prozor, pg.Color("black"), (500, 100), 100,1)
# crtamo glavu
pg.draw.circle(prozor, pg.Color("yellow"), (350, 300),220)
pg.draw.circle(prozor, pg.Color("black"), (350, 300), 220,1)
# crtamo nos
pg.draw.circle(prozor, pg.Color("yellow"), (350, 410),110)
pg.draw.circle(prozor, pg.Color("black"), (350, 410), 110,1)
pg.draw.circle(prozor, pg.Color("black"), (350, 350),30)

# crtamo oci
pg.draw.circle(prozor, pg.Color("black"), (270, 230),30)
pg.draw.circle(prozor, pg.Color("black"), (430, 230),30)

# prikazujemo prozor i čekamo da ga korisnik isključi
pygamebg.wait_loop()

```

Zadatak 4

Rotirane duzi

```
import pygame as pg
import pygamebg

(sirina, visina) = (400, 300) # otvaramo prozor
prozor = pygamebg.open_window(sirina, visina, "Rotirane duzi")

prozor.fill(pg.Color("white"))

# broj podeoka
n = 10
# prirastaj
dx = sirina / n
dy = visina / n

# crtamo n linija u donjem levom uglu prozora
for i in range(n + 1):
    pg.draw.line(prozor, pg.Color("black"), (0, i*dy), (i*dx, visina), 1)

# crtamo n linija u gornjem desnom uglu prozora
for i in range(n + 1):
    pg.draw.line(prozor, pg.Color("black"), (sirina, visina - i*dy),
(sirina - i*dx, 0), 1)

# crtamo n linija u gornjem levom uglu
for i in range(n + 1):
    pg.draw.line(prozor, pg.Color("black"), (0, visina - i*dy), (i*dx, 0),
1)

# crtamo n linija u donjem desnom uglu
for i in range(n + 1):
    pg.draw.line(prozor, pg.Color("black"), (sirina, i*dy), (sirina - i*dx,
visina), 1)

# prikazujemo prozor i čekamo da ga korisnik isključi
pygamebg.wait_loop()
```

Zadatak 5

Kućice

```
import pygame as pg
import random
import pygamebg

(sirina,visina)=(500, 300)
prozor=pygamebg.open_window(sirina, visina,"Kućice" )
prozor.fill(pg.Color("darkgreen")) # bojimo pozadinu ekrana u tamno zeleno

broj_kucica = 4

def kuca(x, y, boja_zidova):
    pg.draw.polygon(prozor, pg.Color("red"), [(x, y), (x+70, y-50), (x+140,
y)]) # krov
```

```

    pg.draw.rect(prozor, boja_zidova, (x, y, 140, 100)) #
kuca
    pg.draw.rect(prozor, pg.Color("brown"), (x + 10, y + 20, 30, 30)) #
levi prozor
    pg.draw.rect(prozor, pg.Color("brown"), (x + 100, y + 20, 30, 30)) #
desni prozor
    pg.draw.rect(prozor, pg.Color("brown"), (x + 50, y + 30, 40, 70))
#vrata

for i in range (broj_kucica):
    x = random.randint(0, sirina - 140) #od sirine prozora oduzimamo sirinu
kucice
    y = random.randint(50, visina - 100)
    boja = (255, 255, random.randint(0, 255))
    kuca(x, y, boja)
    pg.display.update()

# prikazujemo prozor i čekamo da ga korisnik isključi
pygamebg.wait_loop()

```

Zadatak 6

Loptica - levo desno

```

import math
import pygame as pg
import pygamebg
(sirina,visina)=(600,200)
prozor=pygamebg.open_window(sirina, visina,"Loptica - levo - desno" )

# Definisanje parametara elipse

r=50 #poluprecnik
x = 0+r
y = visina//2
dx = 2

def crtaj():
    prozor.fill(pg.Color("white"))
    pg.draw.circle(prozor, pg.Color("red"), (x, y), r)

def novi_frejm():
    global x, y, dx

    if x + dx > sirina - r:
        dx = -dx
    if x + dx < 0 + r:
        dx = -dx

    x += dx

    crtaj()

pygamebg.frame_loop(100, novi_frejm)

```

Zadatak 7

Loptica na elipsi:

```
import math
import pygame as pg
import pygamebg
(sirina,visina)=(600,400)
prozor=pygamebg.open_window(sirina, visina,"Primer - elipsa" )

# Definisanje parametara elipse
a=200
b=120
C = (sirina//2, visina//2) #centar elipse
r=15 # precnik loptice
x = sirina//2
y = visina//2 + b
dx = 3 # pomeraj

def crtaj():
    prozor.fill(pg.Color("white"))
    pg.draw.ellipse(prozor , pg.Color("darkgray"), (sirina//2-a, visina//2-
b, 2*a, 2*b),1) #
    pg.draw.circle(prozor, pg.Color("red"), (x, y), r)

def novi_frejm():
    global x, y, dx

    if x + dx > sirina//2 + a:
        dx = -dx
    if x + dx < sirina//2 - a:
        dx = -dx

    x += dx
    x_pomocno = x - sirina//2
    y_pomocno = round(b * math.sqrt(1 - x_pomocno*x_pomocno/a/a))

    if dx > 0:
        y = visina//2 + y_pomocno
    if dx < 0:
        y = visina//2 - y_pomocno
    crtaj()

pygamebg.frame_loop(100, novi_frejm)
```

Loptica na elipsi - preko uglova:

```
import math
import pygame as pg
import pygamebg
(sirina,visina)=(600,400)
prozor=pygamebg.open_window(sirina, visina,"Primer - elipsa preko uglova" )
```

```

# Definisanje parametara elipse
a=200
b=120
C = (sirina//2, visina//2) #centar elipse
r=15 # precnik loptice
x = sirina//2 + a
y = visina//2
teta = 0 # pomeraaj
dteta = math.pi/180

def crtaj():
    prozor.fill(pg.Color("white"))
    pg.draw.ellipse(prozor , pg.Color("darkgray"), (sirina//2-a, visina//2-
b, 2*a, 2*b),1) #
    pg.draw.circle(prozor, pg.Color("red"), (x, y), r)

def novi_frejm():
    global x, y, teta

    if teta + dteta > 2 * math.pi:
        teta = 0
        teta += dteta;

    x_pomocno = a*b/(math.sqrt(b*b+a*a*math.tan(teta)*math.tan(teta)))
    y_pomocno = abs(math.tan(teta)) * x_pomocno

    if teta < math.pi/2:
        x = sirina//2 + x_pomocno
        y = visina//2 - y_pomocno
    elif teta < 2*math.pi/2:
        x = sirina//2 - x_pomocno
        y = visina//2 - y_pomocno
    elif teta < 3*math.pi/2:
        x = sirina//2 - x_pomocno
        y = visina//2 + y_pomocno
    else:
        x = sirina//2 + x_pomocno
        y = visina//2 + y_pomocno

    x = int(x)
    y = int(y)
    crtaj()

pygamebg.frame_loop(100, novi_frejm)

```

Prava i loptica

```

import math
import pygame as pg
import pygamebg
(sirina,visina)=(600,400)
prozor=pygamebg.open_window(sirina, visina,"Primer - prava i loptica" )

```

```

# Definisanje parametara prave Ax + By = 0 podrazumeva se da prava prolazi
kroz koordinatni pocetak
A = 1
B = -7

C1 = (50, 300) # pocetak prave, posmatramo kao koordinatni pocetak

x = C1[0]
y = C1[1]

r = 15
dx = 3 # pomeraaj

def crtaj():
    prozor.fill(pg.Color("white"))
    # jednačina prave je Ax+By=0 -> Y=-Ax/B
    # int(C1[1] - (-A/B)*(sirina-C1[0])) ovde je minus zbog obrnute y-ose
    pg.draw.line(prozor, pg.Color("darkgray"), (C1[0], C1[1]), (sirina-50,
int(C1[1] - (-A/B)*(sirina-C1[0]-50))), 1) #
    pg.draw.circle(prozor, pg.Color("red"), (x, y), r)

def novi_frejm():
    global x, y, dx

    if x + dx > sirina-50:
        dx = -dx
    if x + dx < C1[0]:
        dx = -dx

    x += dx
    dy = (-A/B)*(x - C1[0])
    y = C1[1] - dy;
    x = int(x)
    y = int(y)
    crtaj()

pygamebg.frame_loop(100, novi_frejm)

```

Zadatak 8

Strazari koji patroliraju

```

import pygame as pg
import pygamebg

(sirina, visina) = (800, 350) # otvaramo prozor
prozor = pygamebg.open_window(sirina, visina, "Stražar koji patrolira")

# učitavamo dve slike -
# stražara okrenutog na levo i stražara okrenutog na desno
strazar_levo = pg.image.load('strazar_levo.png')
strazar_desno = pg.image.load('strazar_desno.png')

# izračunavamo dimenzije slika (obe slike su istih dimenzija)

```

```

strazar_sirina = strazar_levo.get_width()
strazar_visina = strazar_levo.get_height()

# početni polozej stražara (gornjeg levog ugla slike)
x = 0
y = 30
x2 = sirina - strazar_sirina
y2 = 30
# horizontalni pomeraj stražara u pikselima u svakom koraku
dx = 5
dx2 = -5

def crtaj():
    prozor.fill(pg.Color("white"))    # bojimo pozadinu u belo
    # u zavisnosti od smeru kretanja biramo sliku koja će se prikazivati
    if dx > 0:
        slika1 = strazar_desno
    else:
        slika1 = strazar_levo

    if dx2 > 0:
        slika2 = strazar_desno
    else:
        slika2 = strazar_levo

    prozor.blit(slika1, (x,y))# prikazujemo sliku na prozoru
    prozor.blit(slika2, (x2,y2))# prikazujemo sliku na prozoru

def novi_frejm():
    global x, x2, dx, dx2    # globalne promenljive koje se mogu promeniti

    if x + dx < 0:
        dx = dx * (-1)
    if x2 + dx2 > sirina - strazar_sirina:
        dx2 = dx2 * (-1)

    x = x + dx
    x2 = x2 + dx2

    if x2-x < strazar_sirina: # ako je stražar ispao van prozora
        dx = dx * (-1)
        dx2 = dx2 * (-1)

    crtaj()

pygamebg.frame_loop(50, novi_frejm)

```