**Cvičenie**

Python, grafika, náhodne

V jednotlivých príkladoch zmeňte parametre ( súradnice, rozmer, farbu, text), sledujte ako sa mení vykreslenie obrázkov

1. Obdĺžnik

import tkinter

canvas = tkinter.Canvas()

canvas.pack()

x, y = 50, 30

sirka, vyska = 140, 80

canvas.create\_rectangle(x, y, x + sirka, y + vyska)

2. Obdĺžnik – náhodne

import tkinter

import random

canvas = tkinter.Canvas()

canvas.pack()

for i in range(5):

x = random.randint(10, 240)

y = random.randint(10, 180)

sirka, vyska = 140, 80

canvas.create\_rectangle(x, y, x + sirka, y + vyska)

3. Štvorec – náhodne

import tkinter

import random

xmax = 300

ymax = 300

canvas = tkinter.Canvas(width=xmax, height=ymax)

canvas.pack()

def stvorec(x, y, a, farba):

canvas.create\_rectangle(x, y, x + a, y + a, fill=farba)

for i in range(20):

strana = random.randint(10,100)

x = random.randint(0, xmax)

y = random.randint(0, ymax)

farba = random.choice(("black", "red", "blue", "yellow", "green"))

stvorec(x, y, strana, farba)

canvas.mainloop()

4. Dopravné značky

Kreslenie geometrických tvarov, farba, text

import tkinter

canvas = tkinter.Canvas(width=1000, height=800)

canvas.pack()

canvas.create\_text(250, 25, text="Križovatka", font="Arial 25 bold")

canvas.create\_line(50,350,450,350,250,50,50,350,80,350, fill="red", width=30)

canvas.create\_polygon(50,350,450,350,250,50,50,350, fill="white")

canvas.create\_line(180,320,320,180,fill="black", width=20)

canvas.create\_line(180,180,320,320, fill="black", width=20)

canvas.create\_text(600, 25, text="Slepá cesta", font = "Arial 25 bold")

canvas.create\_rectangle(500, 50, 800, 350, fill="blue", outline="black", width=3)

canvas.create\_rectangle(620, 150, 680, 300, fill="white", outline="white")

canvas.create\_rectangle(560, 100, 740, 150, fill="white", outline="white")

canvas.create\_rectangle(570, 110, 730, 140, fill="red", outline="red")

canvas.create\_text(210, 400, text = "Zákaz zastavenia", font = "Arial 25 bold")

canvas.create\_oval(50, 440, 370, 760, fill = "white", outline="black")

canvas.create\_oval(61, 451, 359, 749, fill = "red", outline="red")

canvas.create\_oval(101, 491, 319, 709, fill = "blue", outline="blue")

canvas.create\_line(106, 496, 314, 704, fill = "red", width = 28)

canvas.create\_line(106 , 704, 314, 496, fill = "red", width = 28)

canvas.create\_text(625, 400, text="Nebezpečné klesanie", font="Arial 25 bold")

canvas.create\_polygon(600, 450, 450, 750, 750, 750, 600, 450, fill="white", outline="white", width=4)

canvas.create\_polygon(600, 455, 455, 745, 745, 745, 600, 455, fill="red", outline="red")

canvas.create\_polygon(600, 495, 490, 720, 710, 720, 600, 495, fill="white", outline="white")

canvas.create\_polygon(491, 721, 709, 721, 519, 664, fill="black", outline="black")

canvas.create\_text(600, 665, text="10 %", font="Arial 25 bold", fill="black", angle=345)

5. Terč

import tkinter

canvas = tkinter.Canvas()

canvas.pack()

canvas.create\_oval(20,20,170,170, width=5, outline='black',fill='grey')

canvas.create\_oval(40,40,150,150, width=3, outline='black')

canvas.create\_oval(60,60,130,130, width=3, outline='black')

canvas.create\_oval(80,80,110,110, width=4, outline='black')

canvas.create\_oval(110,110,80,80, width=3, outline='black')

canvas.create\_oval(80,30,110,60, fill='red')

čiary pomocou myšky

import tkinter

def klik(event):

canvas.create\_line(10, 100, event.x, event.y)

canvas = tkinter.Canvas()

canvas.pack()

canvas.bind ('<ButtonPress>', klik)