Introduction.

1. Network credentials: `Laboratorium-IoT / IoTL@bolatorium`
2. Github repository - https://github.com/tocet/prog_devices

Task. 1. Basic application.

```
import tkinter as tk

#window
wnd = tk.Tk()
wnd.title("Tkinter demo")

#run
wnd.mainloop()
```

Task. 2. Image.

```
import tkinter as tk
from tkinter.ttk import *
from tkinter.messagebox import *

def convert():
    temp_K = temp_C.get() + 273.15
    print(temp_K)
    print(type(temp_K))
    showinfo(title="Temperature in K",message=str(temp_K))

#window
wnd = tk.Tk()
wnd.title("Temperature converter")
wnd.geometry('400x100')

#app window - label
lab_title = Label(wnd,
                  text="Celsius to Kelvin converter",
                  font=('Helvetica',14))
lab_title.pack()

#app window - input field
```

```
frame_input = Frame(wnd)
temp_C = tk.DoubleVar()
entry = Entry(frame_input, textvariable=temp_C)
btn_convert = Button(frame_input,
                     text='Convert',
                     command=convert)
entry.pack(side='left',padx=15)
btn_convert.pack(side='left')
frame_input.pack(pady=15)

#run window
wnd.mainloop()
```

Task. 3. Layout *pack* example.

Download *layout_pack.py*

Task. 4. Improve the snake game.

Download *snake_en.py*. Improve the game:

- (0.1) add a Game Over window with an image;
- (0.1) add a Play once again window;
- (0.1) create a counter of eaten apples;
- (0.1) detect collision with walls.
- (0.5)implementing a two-player mode

Presenting this solution is worth 1 point to the final course score.

For those interested:

1. Tkinter tutorial:

   www.pythontutorial.net/tkinter/

2. Tk docs:

   tkdocs.com/tutorial/index.html