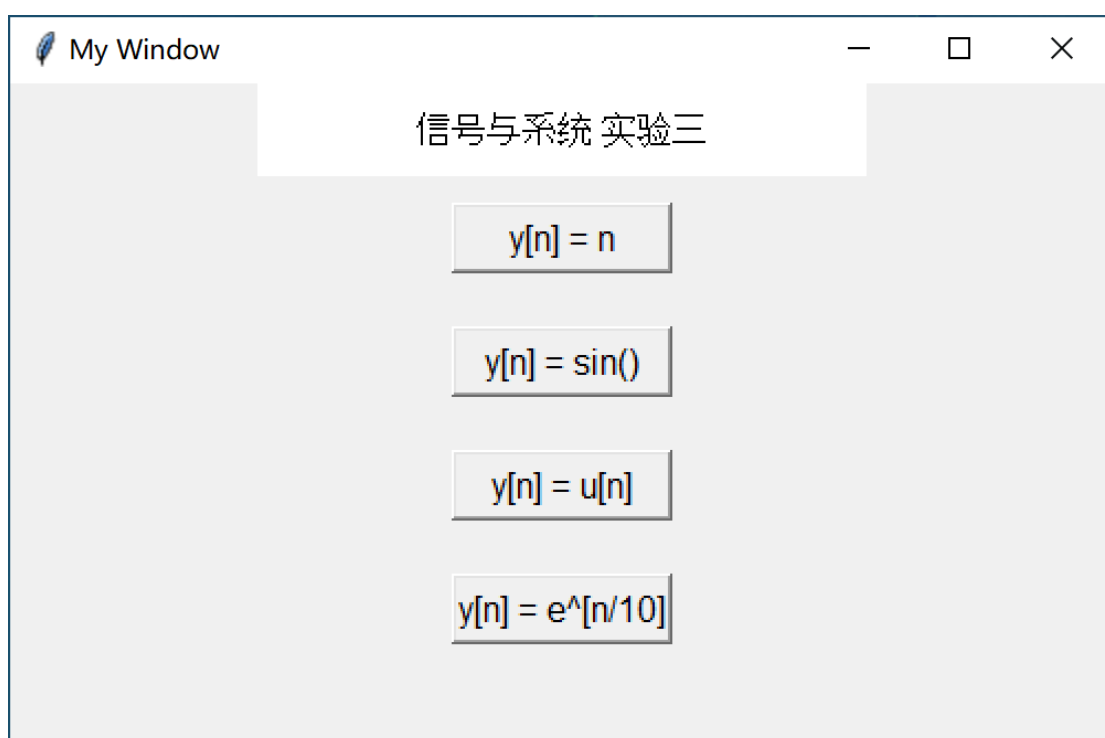


实验报告

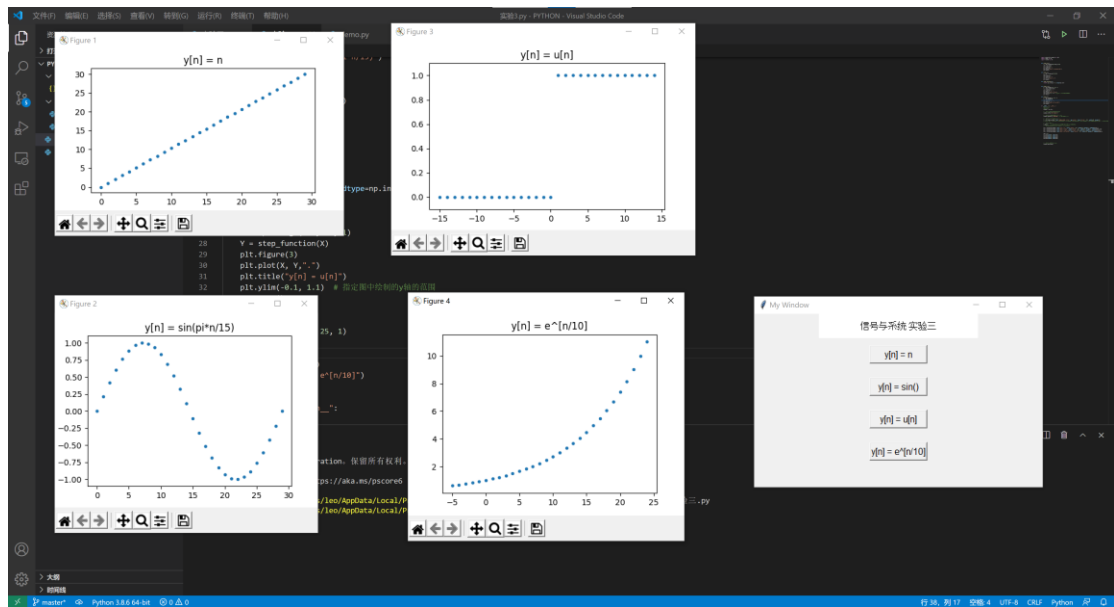
1. 实现 GUI，添加按钮



实现方法：python tkinter 模块

代码见附录

2. 示例



主页网址: <https://leodeskss.github.io>

附录：

```
import matplotlib.pyplot as plt
import numpy as np
import tkinter as tk
```

```
def draw_sin():
    x = np.linspace(0,2*np.pi,30)
    y5 = np.sin(x)
    plt.figure(2)
    plt.plot(y5,".")
    plt.title("y[n] = sin(pi*n/15)")
    plt.show()
```

```
def draw_n():
    x = np.linspace(0,30,30)
    y1 = x
    plt.figure(1)
    plt.plot(y1,".")
    plt.title("y[n] = n")
    plt.show()
```

```
def step_function(x):
    return np.array(x > 0, dtype=np.int)
```

```
def draw_u_n():
    X = np.arange(-15, 15, 1)
    Y = step_function(X)
    plt.figure(3)
    plt.plot(X, Y,".")
    plt.title("y[n] = u[n]")
    plt.ylim(-0.1, 1.1) # 指定图中绘制的 y 轴的范围
    plt.show()
```

```
def draw_e():
    X = np.arange(-5, 25, 1)
    Y = np.exp(X/10)
    plt.figure(4)
    plt.plot(X, Y,".")
    plt.title("y[n] = e^[n/10]")
    plt.show()
```

```

if __name__ == "__main__":
    #draw_u_n()
    #draw_e()
    window = tk.Tk()

    # 第 2 步, 给窗口的可视化起名字
    window.title('My Window')

    # 第 3 步, 设定窗口的大小(长 * 宽)
    window.geometry('500x300') # 这里的乘是小 x

    # 第 4 步, 在图形界面上设定标签
    l = tk.Label(window, text='信号与系统 实验三', bg='white', font=('Arial', 12), width=30, height=2)
    # 说明: bg 为背景, font 为字体, width 为长, height 为高, 这里的长和高是字符的长和高, 比如
    height=2,就是标签有 2 个字符这么高

    # 第 5 步, 放置标签
    l.pack() # Label 内容 content 区域放置位置, 自动调节尺寸
    # 放置 lable 的方法有: 1) l.pack(); 2)l.place();

    b1 = tk.Button(window, text='y[n] = n', font=('Arial', 12), width=10, height=1, command=draw_n)
    b2 = tk.Button(window, text='y[n] = sin()', font=('Arial', 12), width=10, height=1, command=draw_sin)
    b3 = tk.Button(window, text='y[n] = u[n]', font=('Arial', 12), width=10, height=1, command=draw_u_n)
    b4 = tk.Button(window, text='y[n] = e^[n/10]', font=('Arial', 12), width=10, height=1, command=draw_e)

    num = 12
    b1.pack(padx=0, pady=num)
    b2.pack(padx=0, pady=num)
    b3.pack(padx=0, pady=num)
    b4.pack(padx=0, pady=num)

    # 第 6 步, 主窗口循环显示
    window.mainloop()

```