Interaktívny posuvník pre normálne rozdelenie

Python

```
import numpy as np
import matplotlib.pyplot as plt
from scipy.stats import norm
import ipywidgets as widgets

def normal_plot(mu, sigma):

    x = np.linspace(mu-4*sigma, mu+4*sigma, 400)
    y = norm.pdf(x, mu, sigma)

    plt.figure(figsize=(6,4))
    plt.plot(x,y)
    plt.title(f"Normálne rozdelenie N({mu},{sigma**2})")
    plt.xlabel("x")
    plt.ylabel("f(x)")
    plt.show()

widgets.interact(normal_plot,
                 mu=(-10,10,1),
                 sigma=(0.5,5,0.5));
```

Vizualizácia pravdepodobnosti ako plochy

Python

```python
import numpy as np
import matplotlib.pyplot as plt
from scipy.stats import norm

mu = 50
sigma = 5

a = 42
b = 56

x = np.linspace(30,70,400)
y = norm.pdf(x, mu, sigma)

plt.plot(x,y)

x_fill = np.linspace(a,b,200)
y_fill = norm.pdf(x_fill, mu, sigma)

plt.fill_between(x_fill,y_fill)

plt.title("P(42 < X < 56)")
plt.show()

p = norm.cdf(b,mu,sigma) - norm.cdf(a,mu,sigma)
p
```

Simulácia pravdepodobnosti

Python

```python
import numpy as np
from scipy.stats import norm

mu = 50
sigma = 5

n = 100000

data = np.random.normal(mu, sigma, n)

p_sim = np.mean((data > 42) & (data < 56))

p_theory = norm.cdf(56,mu,sigma) - norm.cdf(42,mu,sigma)

p_sim, p_theory
```