Лабораторная 3

Моисеев М33001, Муров М33011

```python
import numpy as np
import matplotlib.pyplot as plt


mat = np.array([
    [1 / 3, 1 / 3, 1 / 3, 0, 0, 0, 0, 0],
    [1 / 3, 1 / 3, 1 / 3, 0, 0, 0, 0, 0],
    [0, 0, 1 / 3, 1 / 3, 0, 0, 1 / 3, 0],
    [0, 1 / 5, 0, 1 / 5, 1 / 5, 0, 1 / 5, 1 / 5],
    [0, 0, 0, 1 / 3, 1 / 3, 1 / 3, 0, 0],
    [0, 0, 0, 0, 1 / 2, 1 / 2, 0, 0],
    [0, 0, 1 / 3, 1 / 3, 0, 0, 1 / 3, 0],
    [0, 0, 0, 0, 0, 0, 1 / 2, 1 / 2],
])

eps = 1e-6
inits = [
    np.array([1, 0, 0, 0, 0, 0, 0, 0]),
    np.array([0, 1 / 2, 1 / 2, 0, 0, 0, 0, 0]),
]
results = []
for i, init in enumerate(inits):
    prev = init
    diffs = []
    while (diff := np.linalg.norm(prev - (new := prev @ mat))) >= eps:
        diffs.append(diff)
        prev = new
    results.append([round(p, 5) for p in prev])
    fig = plt.figure()
    plt.plot(diffs)
    fig.tight_layout()
    plt.savefig(f"ds{i}.png")
results
```

0.04167	0.08333	0.16667	0.20833	0.125	0.08333	0.20834	0.08333
0.04167	0.08333	0.16667	0.20833	0.125	0.08333	0.20834	0.08333

```python
[round(p, 5) for p in np.linalg.lstsq(np.vstack([mat.T - np.eye(8), np.ones(8)]), np.ones(9))[0]]
```

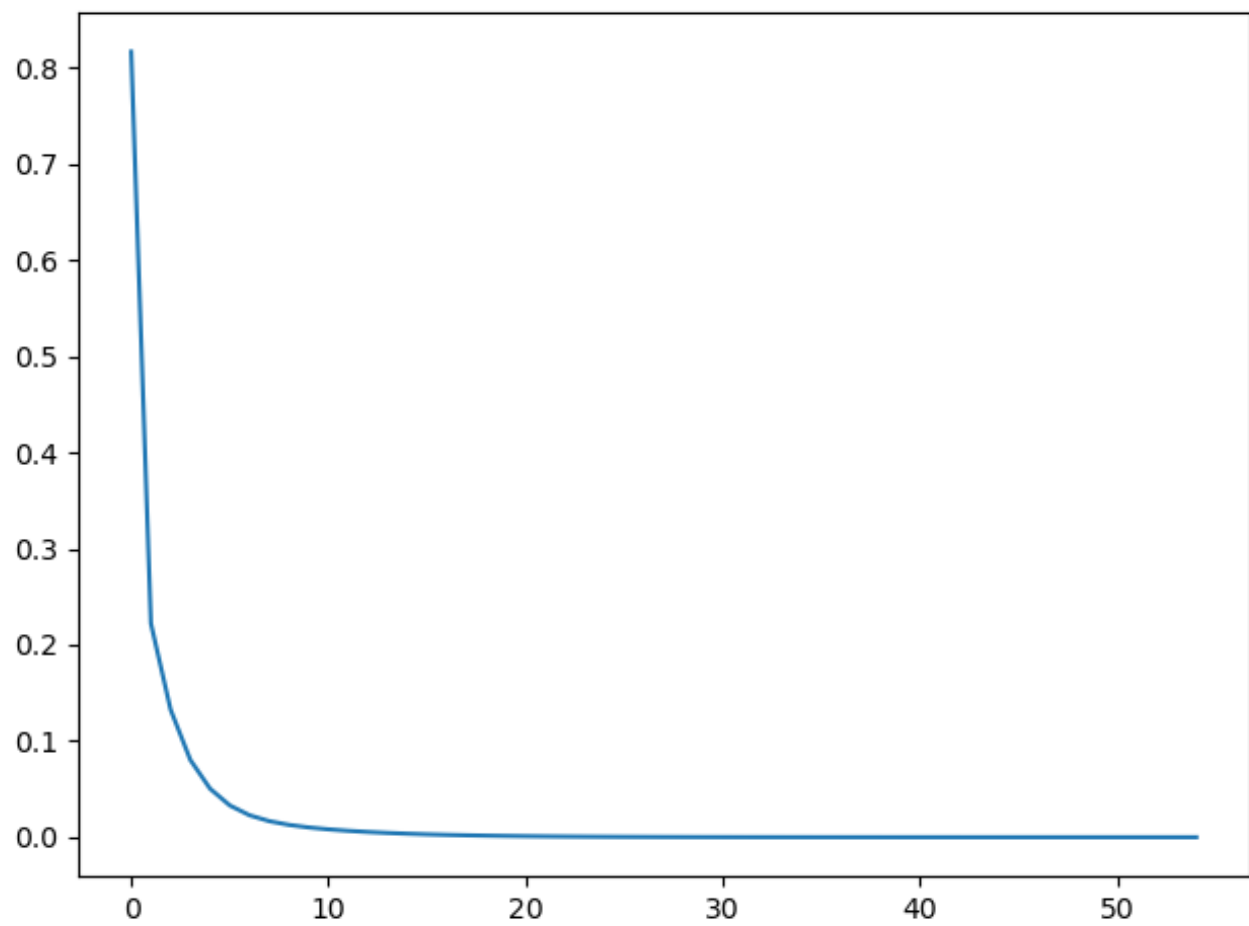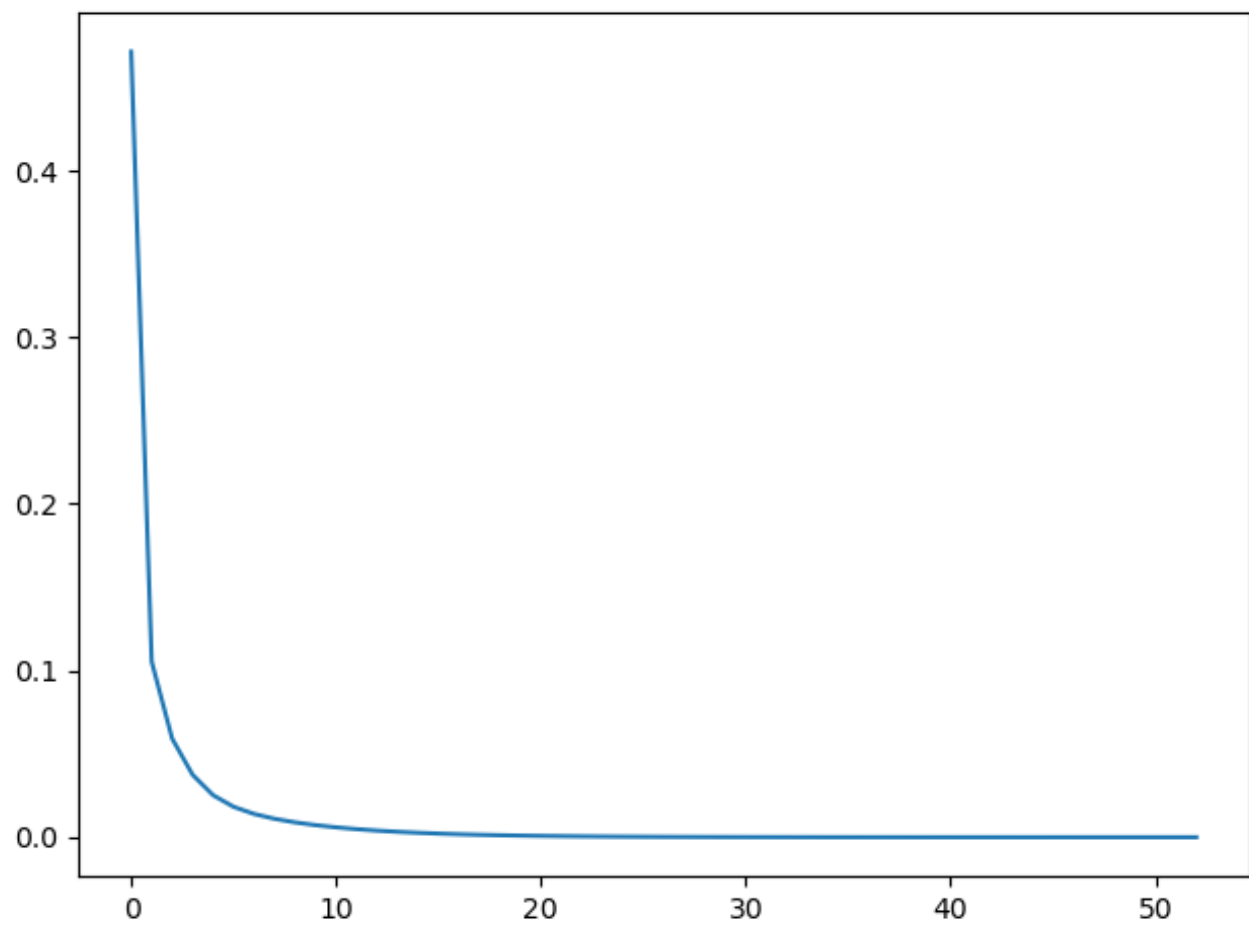|							
0.04167	0.08333	0.16667	0.20833	0.125	0.08333	0.20833	0.08333

Figure 1: 1 начальный вектор

Figure 2: 2 начальный вектор