Admixture

Используя результаты прошлого домашнего задания PCA, .ipynb прошлого домашнего задания воспользуемся Admixture

Установим его

Code

```
!wget https://dalexander.github.io/admixture/binaries/admixture_linux-1.3.0.tar.gz
!tar -xvzf admixture_linux-1.3.0.tar.gz

!chmod +x dist/admixture_linux-1.3.0/admixture
!mv dist/admixture_linux-1.3.0/admixture /usr/local/bin/

!admixture --version
```

Воспользуемся admixture для параметров $K = 3, 4, 5$

Code

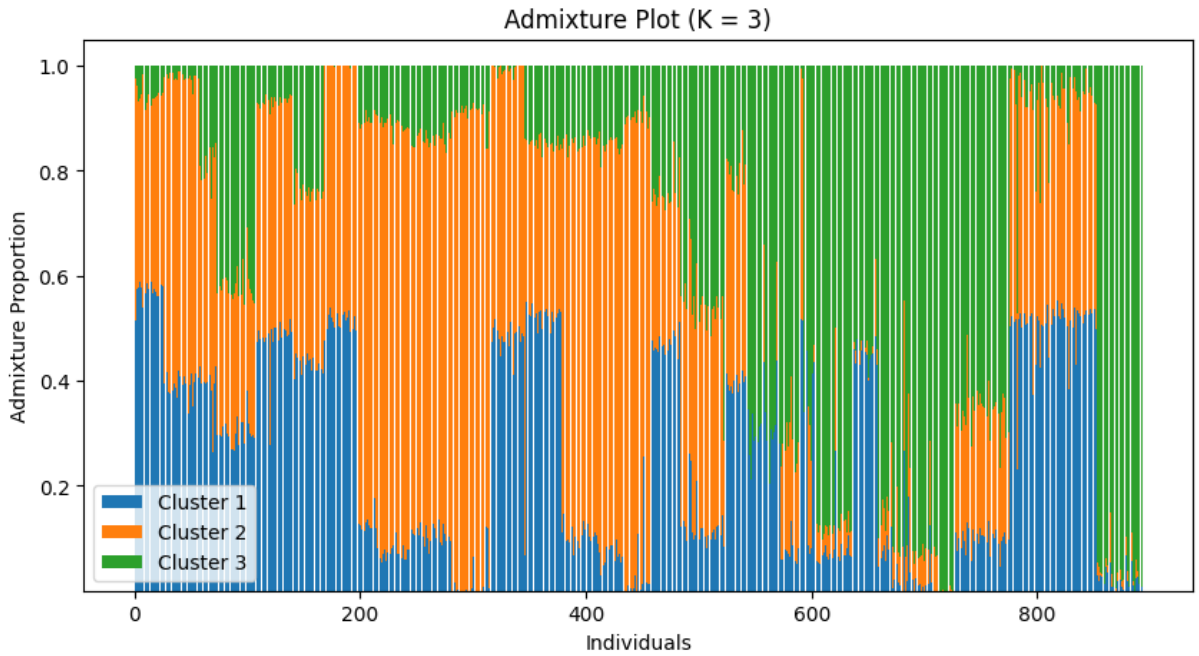
```
import time

K_values = [3, 4, 5]
for K in K_values:
    start_time = time.time()
    print(f"Running ADMIXTURE for K = {K}...")

    !admixture --cv biengi.bed {K}

    total_time = time.time() - start_time
    print(f"Completed ADMIXTURE for K = {K} in {total_time:.2f} seconds.")
```

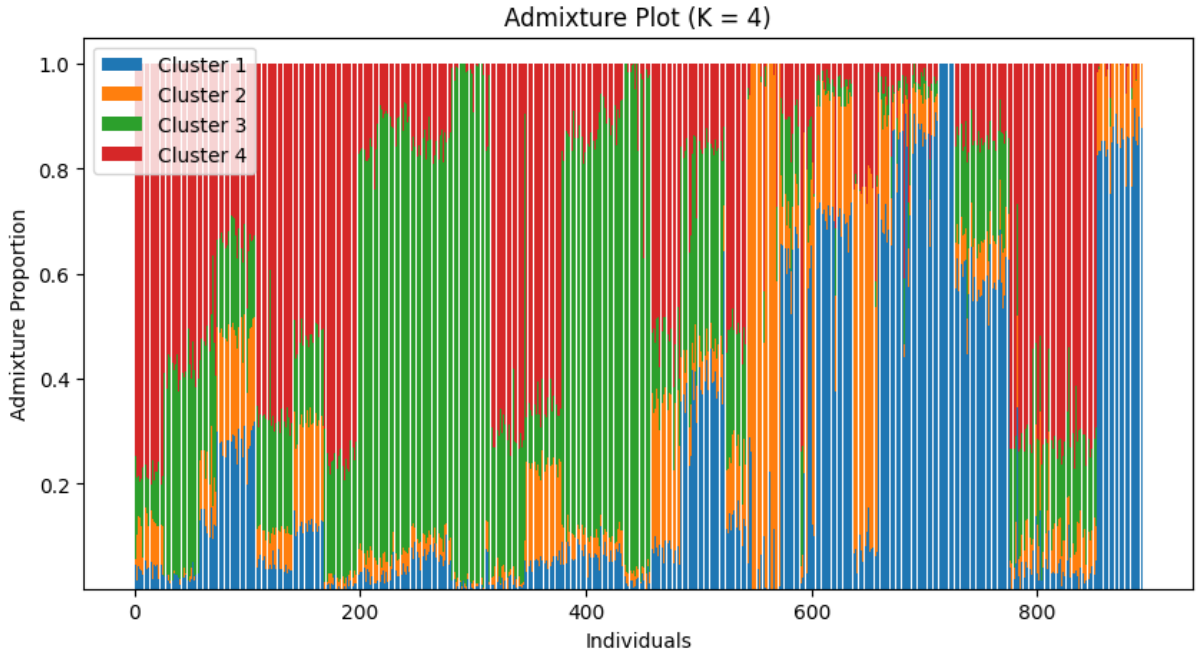
Построим Графики на основе полученных результатов:

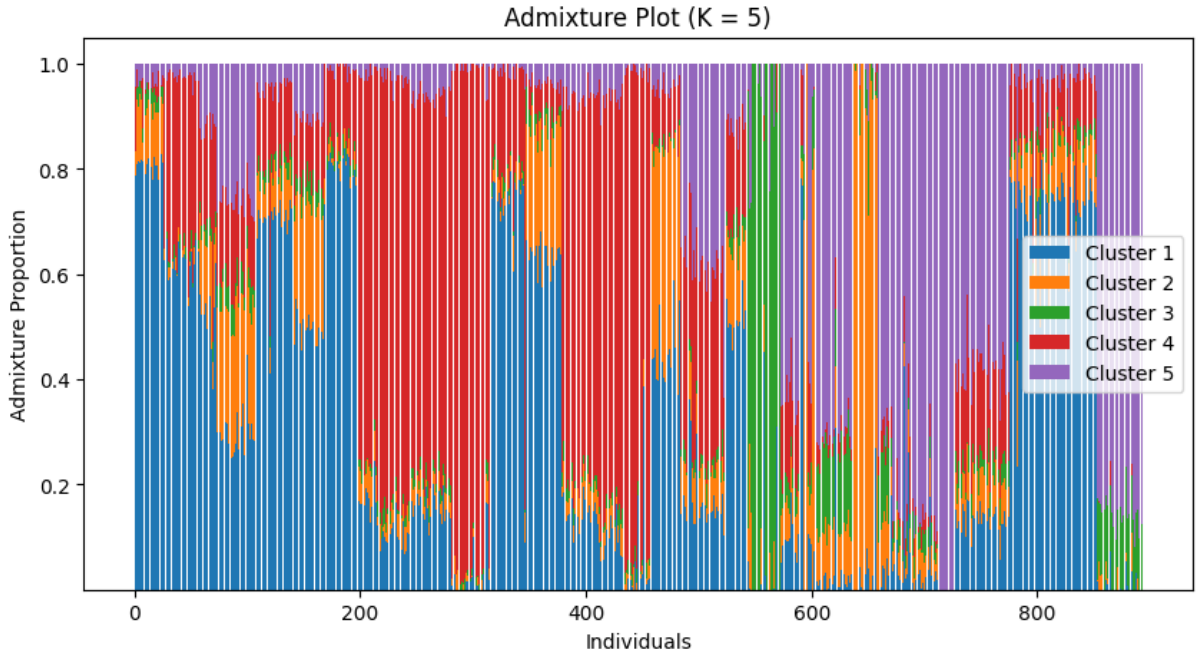
Code

```
import matplotlib.pyplot as plt
import numpy as np
import pandas as pd

for K in K_values:
    q_file = f"biengi.{K}.Q"
    admixture_data = pd.read_csv(q_file, delim_whitespace=True, header=None)

    admixture_data['IID'] = pca_data['IID']

    fig, ax = plt.subplots(figsize=(10, 5))
    bottom_array = np.zeros(admixture_data.shape[0])
    for k in range(K):
        ax.bar(admixture_data.index,
            admixture_data[k],
            bottom=bottom_array,
            label=f'Cluster {k+1}')
        bottom_array += admixture_data[k]

    ax.set_title(f'Admixture Plot (K = {K})')
    ax.set_xlabel('Individuals')
    ax.set_ylabel('Admixture Proportion')
    ax.legend()
    plt.show()
```

Получим:







Также весь код можно посмотреть тут