

La task-ul 1 citim matricea corespunzatoare imaginii, efectuam DVS asupra ei, eliminam valorile considerate nesemnificative iar rezultatul este inmultirea matricelor prelucrate anterior( $U_k * S_k * V_k'$ ).

La task-ul 2 citim matricea corespunzatoare imaginii, extragem dimensiunile lui A, efectuam DVS asupra lui A si reprezentam grafic valorile singulare; reprezentam grafic k si informatia data de primele k valori singulare; reprezentam grafic k si eroarea aproximarii pentru A; reprezentam grafic k si rata de compresie a datelor.

La task-ul 3 citim matricea corespunzatoare imaginii, extragem dimensiunile lui A, calculam media pentru fiecare linie, dupa o scadem din fiecare element, construim matricea Z, efectuam DVS asupra lui Z, calculam spatial k-dimensional al componentelor principale, calculam proiectia lui A in spatiul componentelor principale, aproximam matricea initiala.

La task-ul 4 citim matricea corespunzatoare imaginii, extragem dimensiunile lui A, calculam media pentru fiecare linie, dupa o scadem din fiecare element, construim matricea de covarianta, calculam spatiul k-dimensional al componentelor principale, calculam proiectia lui A in spatiul componentelor principale, aproximam matricea initiala.

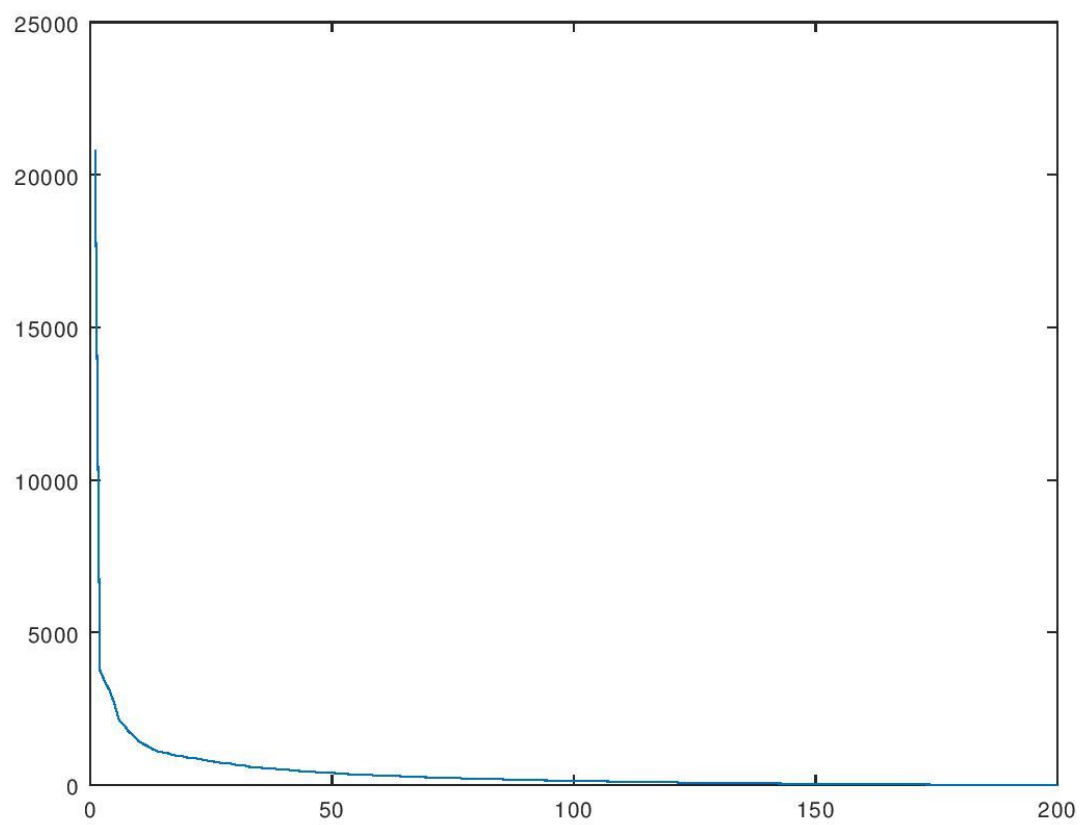
La task-ul 5 citim matricea corespunzatoare imaginii, extragem dimensiunile lui A, calculam  $A_k$  si S pentru  $k = \min(m,n)$  folosind task-ul 3, reprezentam grafic  $\text{diag}(S)$ ; reprezentam grafic k si informatia data de valorile singulare; reprezentam grafic k si eroarea aproximarii pentru A; reprezentam grafic k si rata de compresie a datelor.

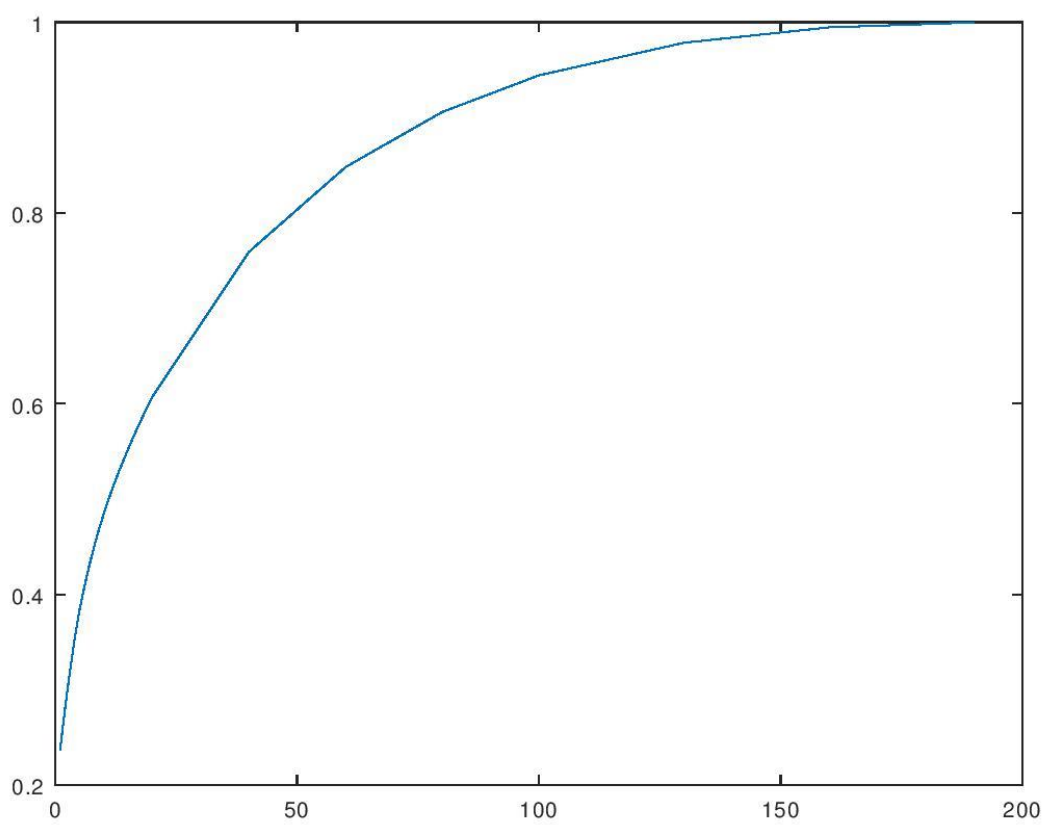
In functia `eigenface_core` citim prima imagine doar pentru a face rost de dimensiune, initializam matricea T, construim matricea T, dupa matricea fiecarei imagini(contine toti vectorii coloana), calculam media pentru fiecare linie din T dupa care calculam A, V, eigenfaces si `pr_img`.

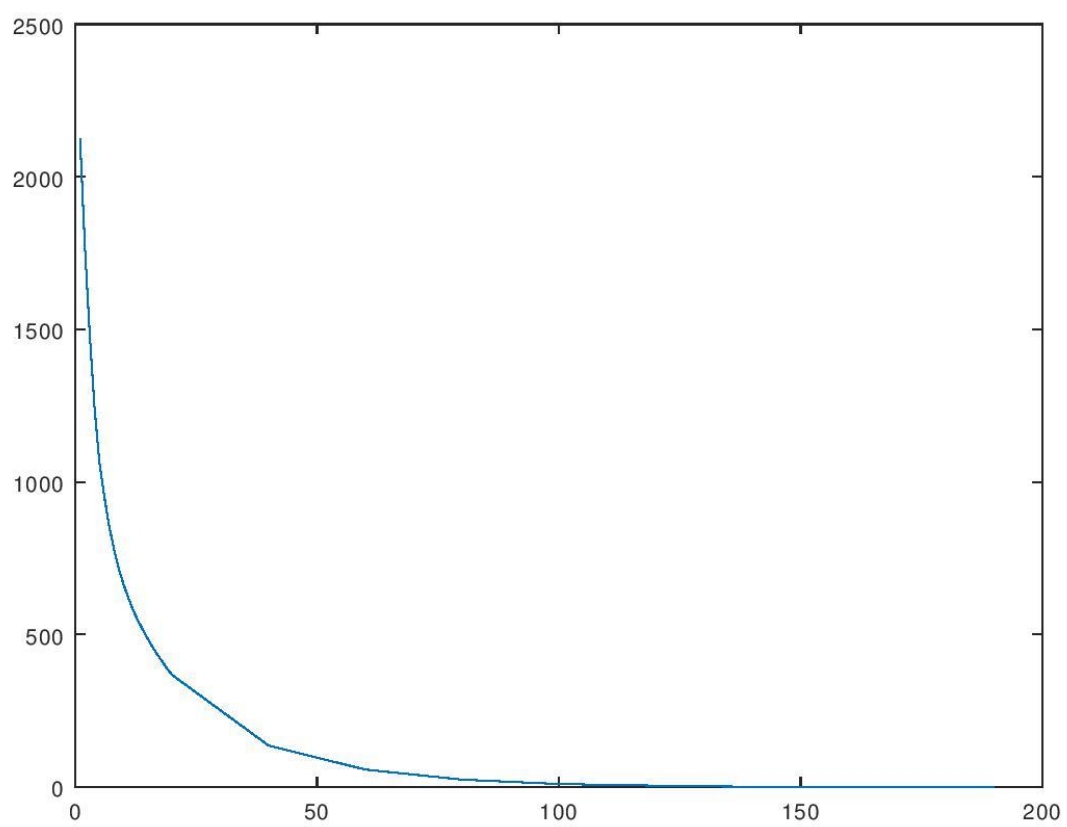
In functia `face_recognition` construim matricea T doar pentru imaginea data, construim o matrice din care scadem media, calculam proiectia imaginii de test, determinam cea mai mica distanta dintre proiectia imaginii de test si proiectiile obtinute anterior si retinem indicele imaginii.

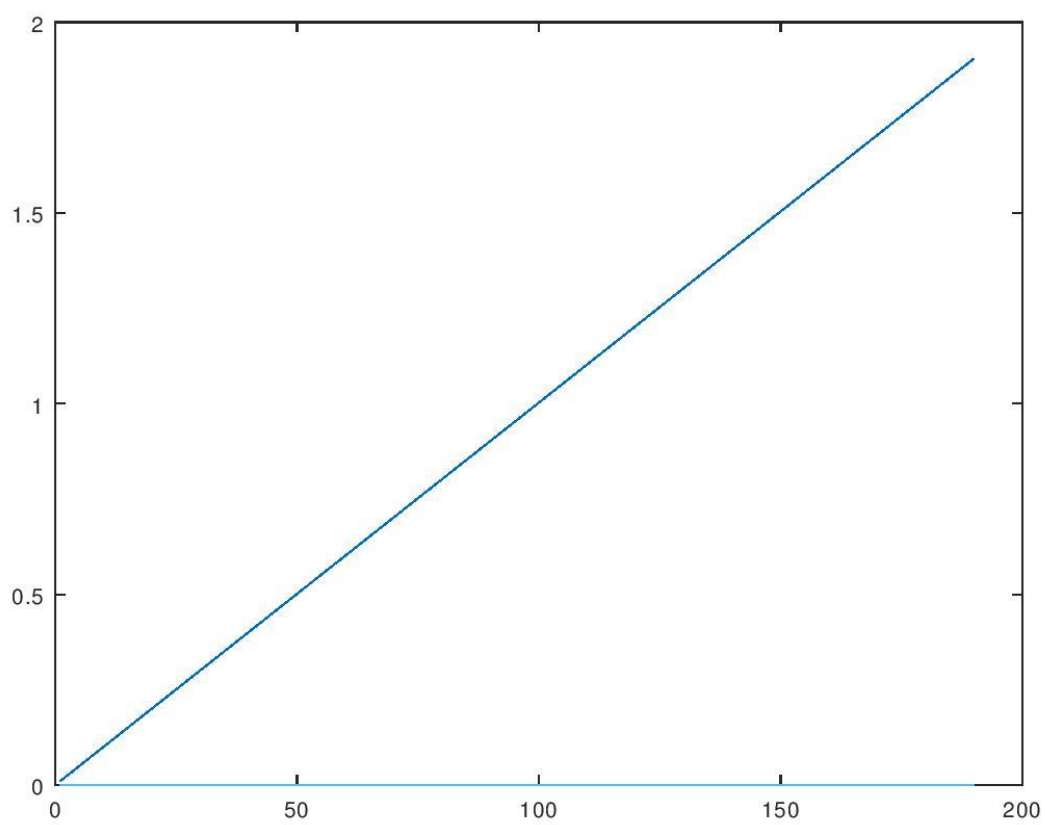
## Grafice task2

### Imaginea 1

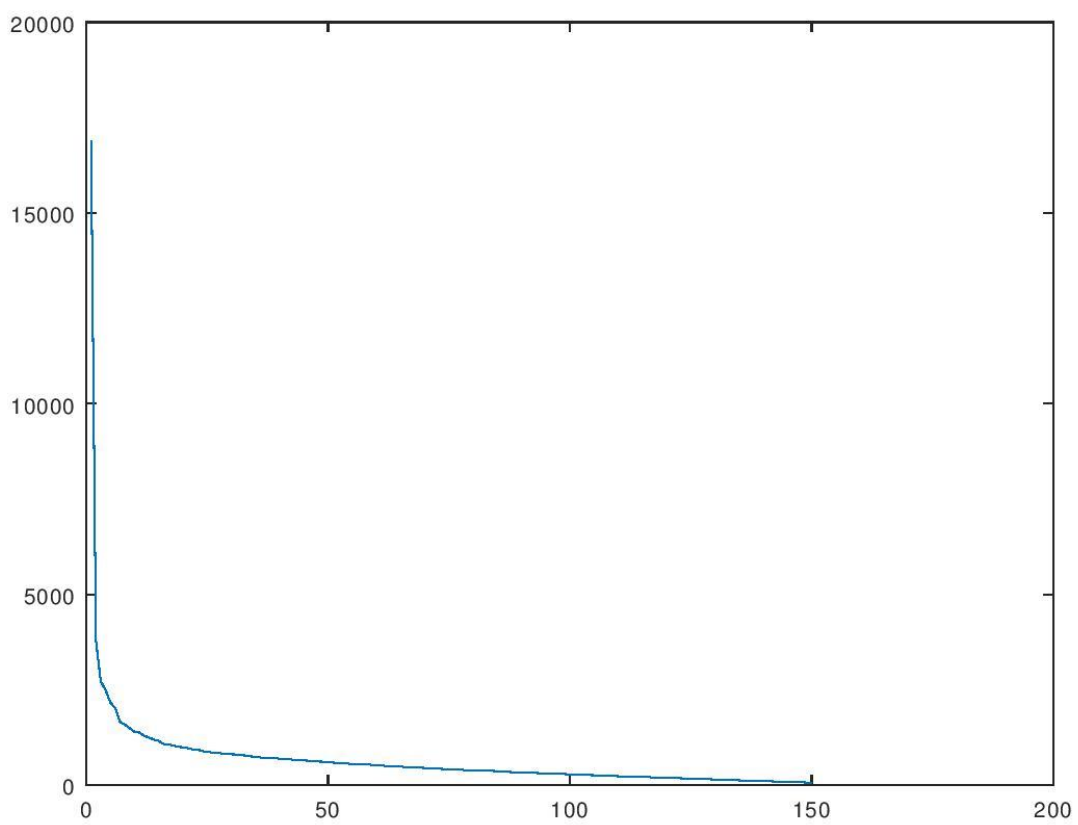


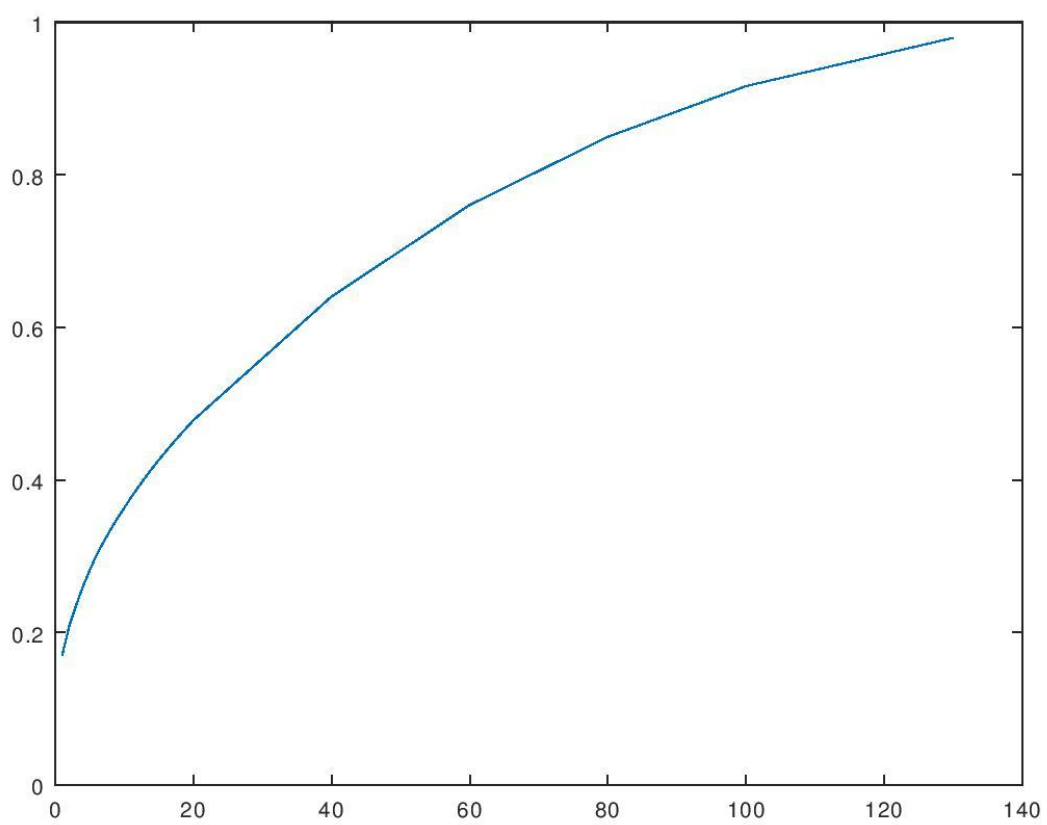


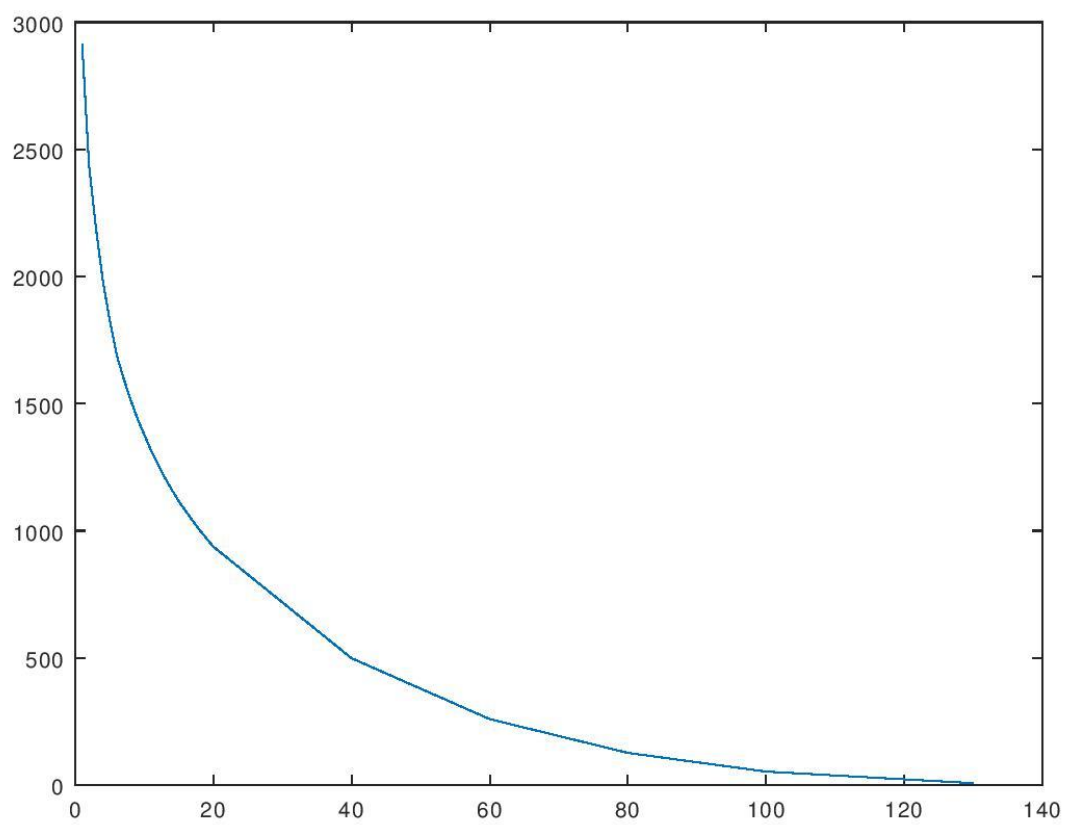




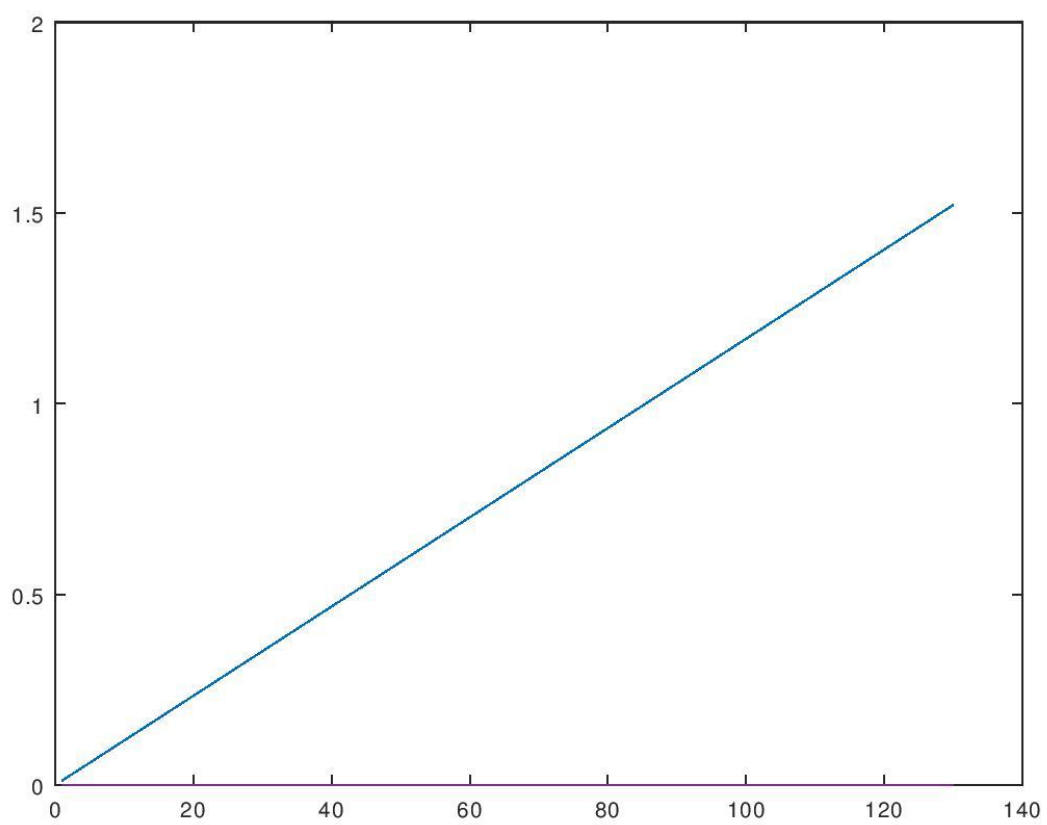
Imaginea 2



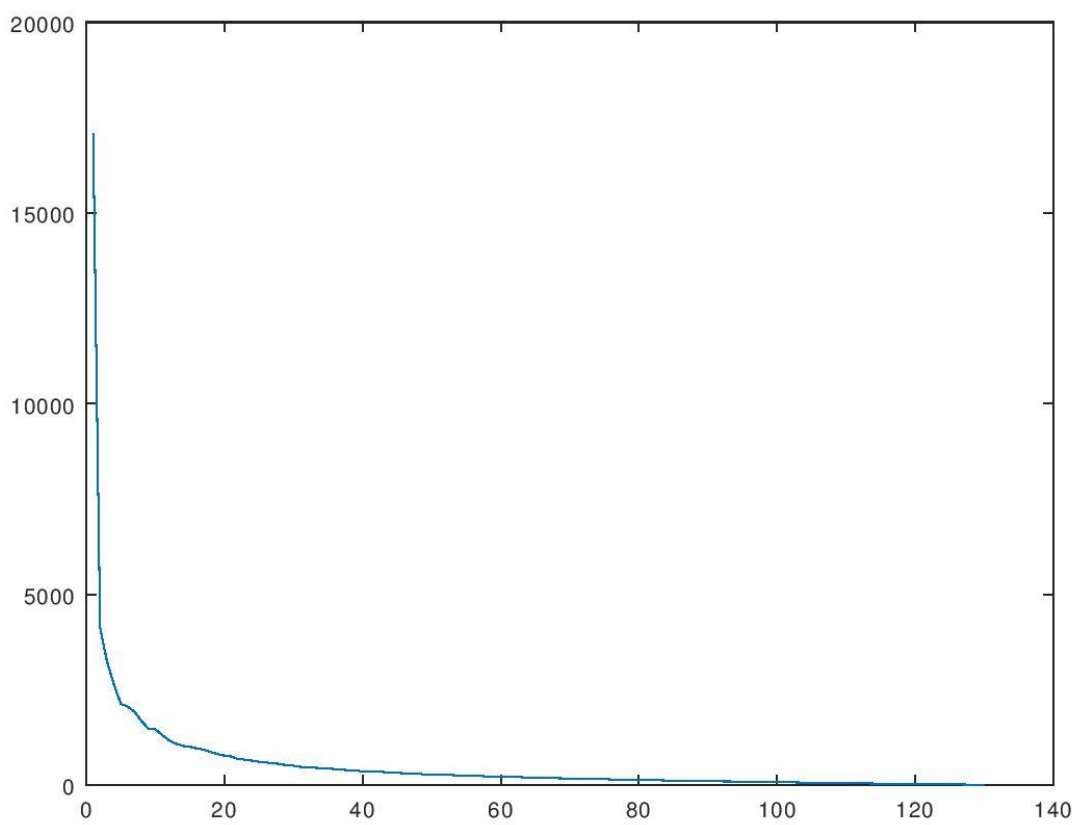


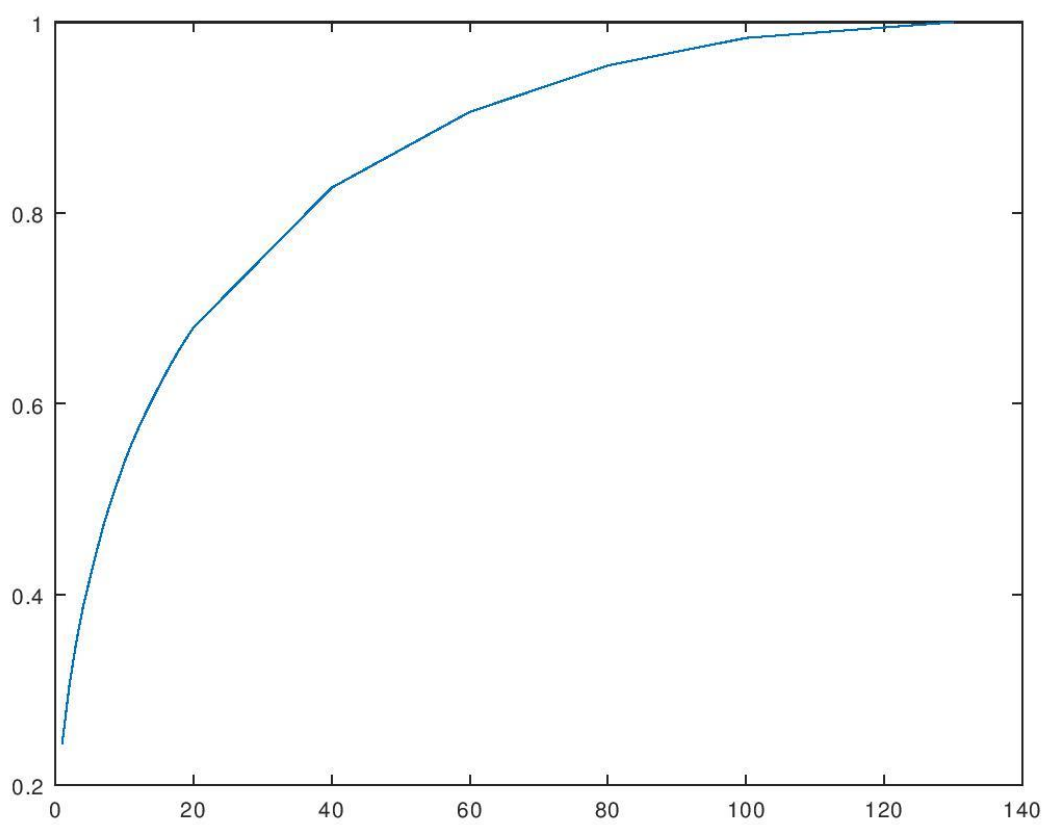


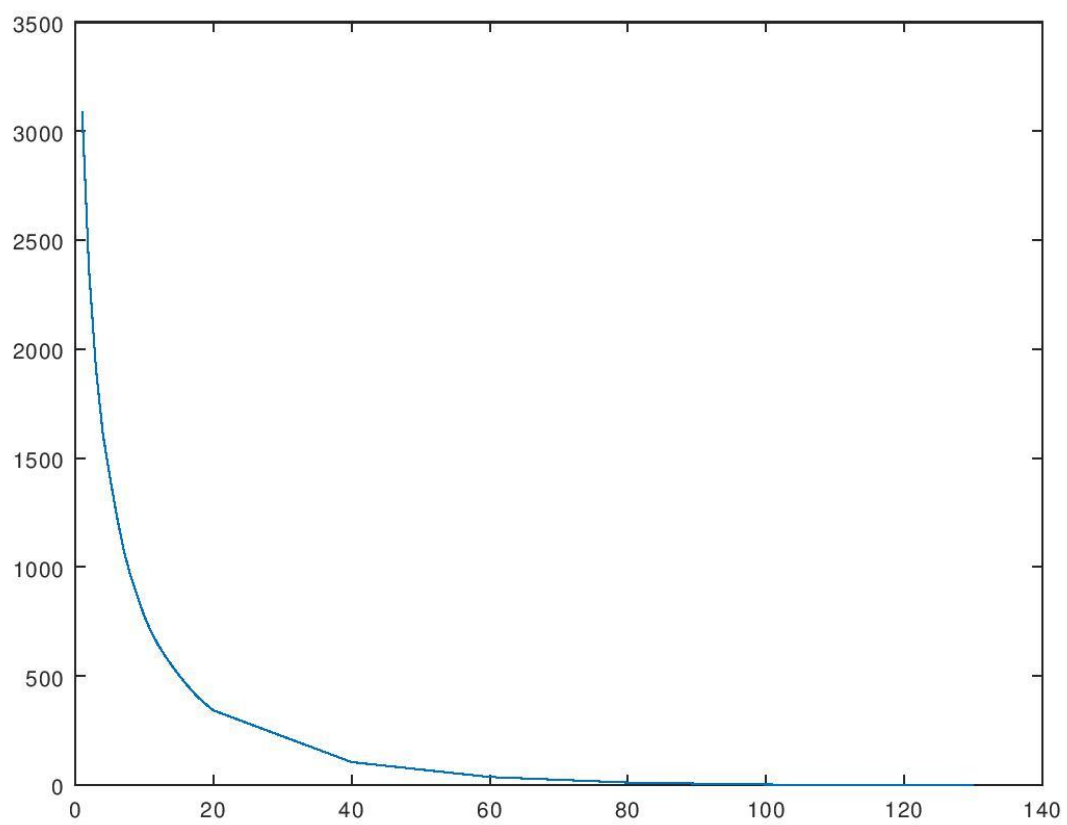


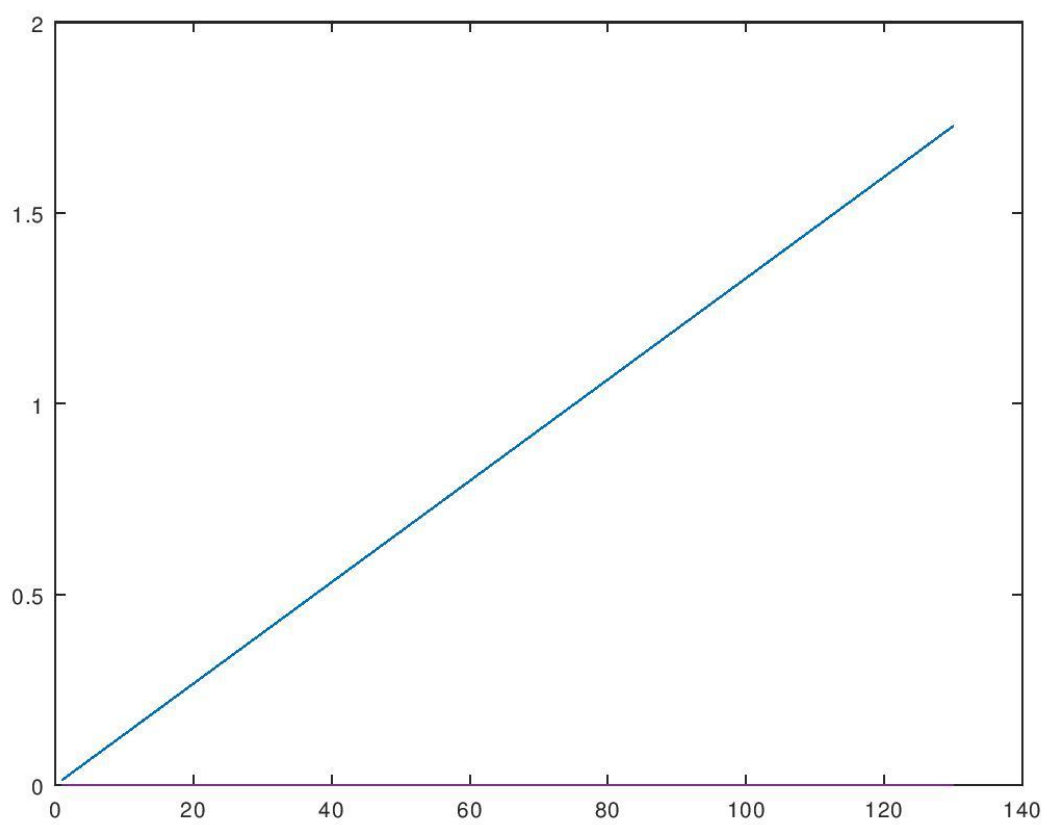


Imaginea 3

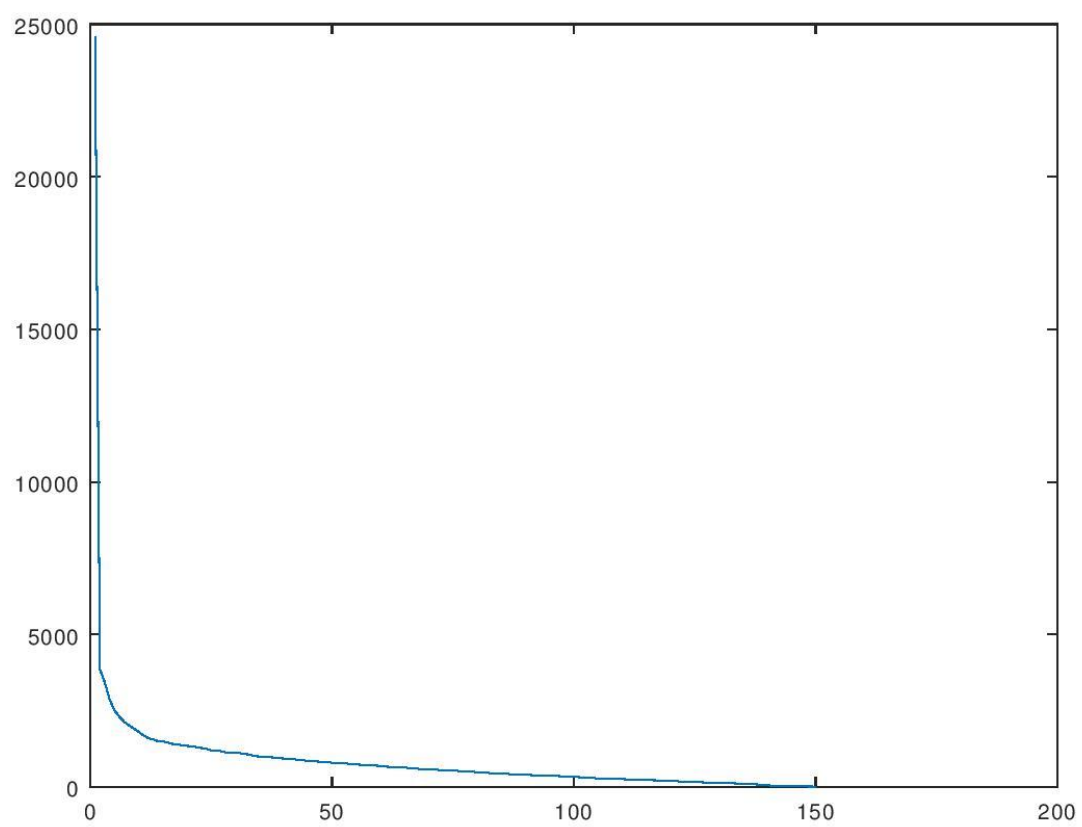


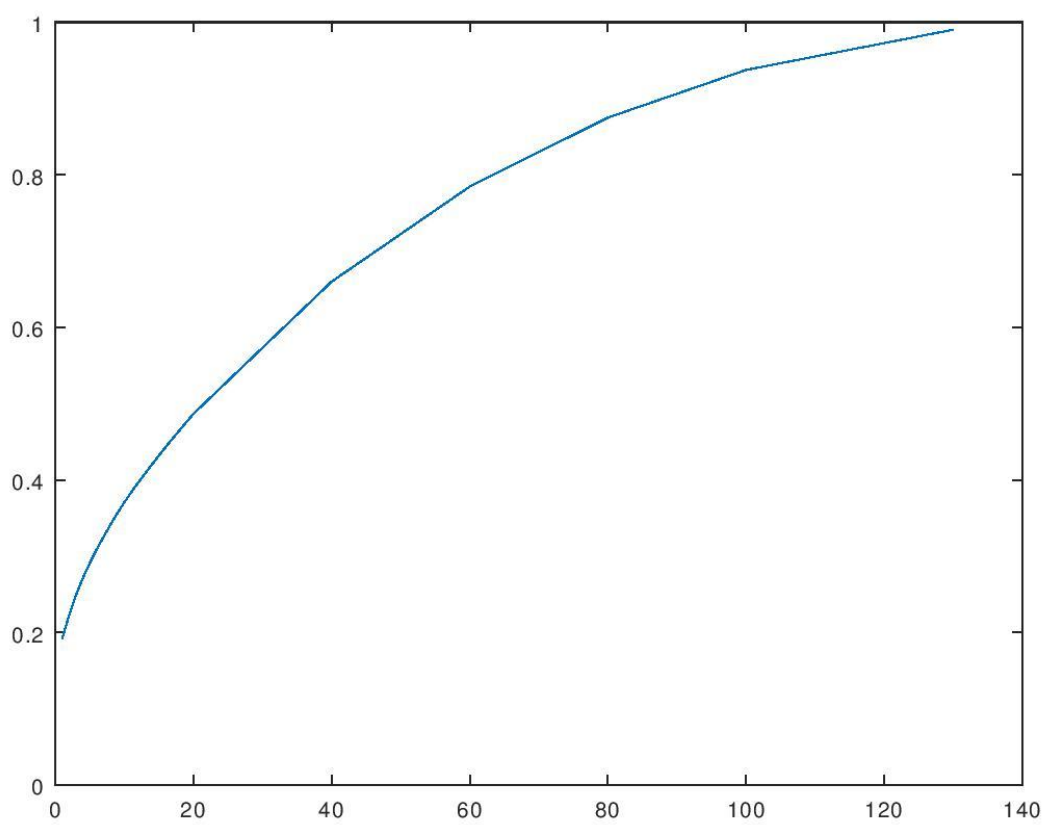


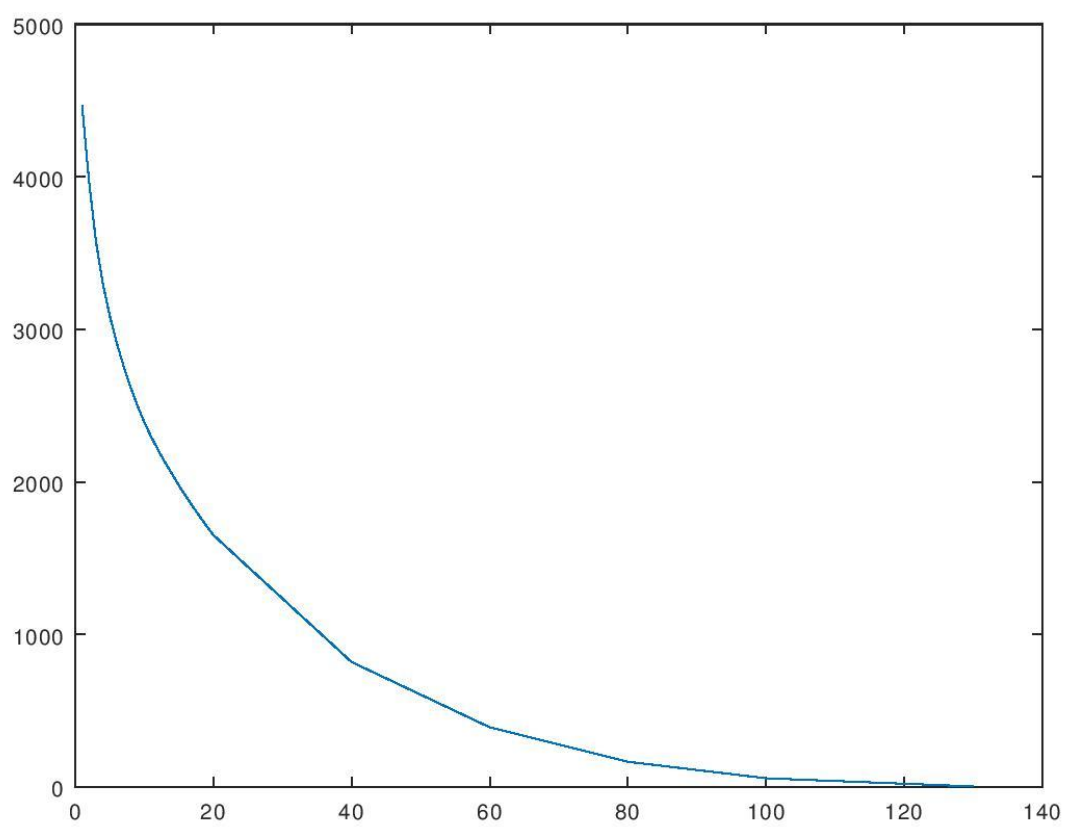




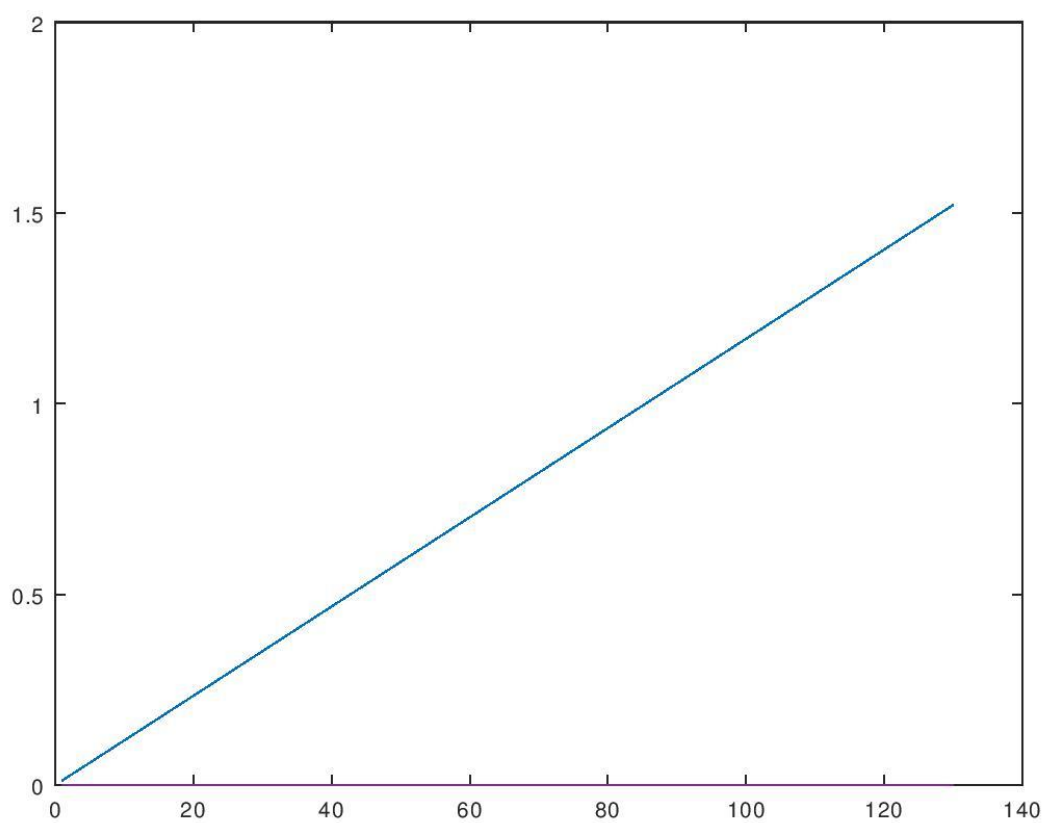
Imaginea 4





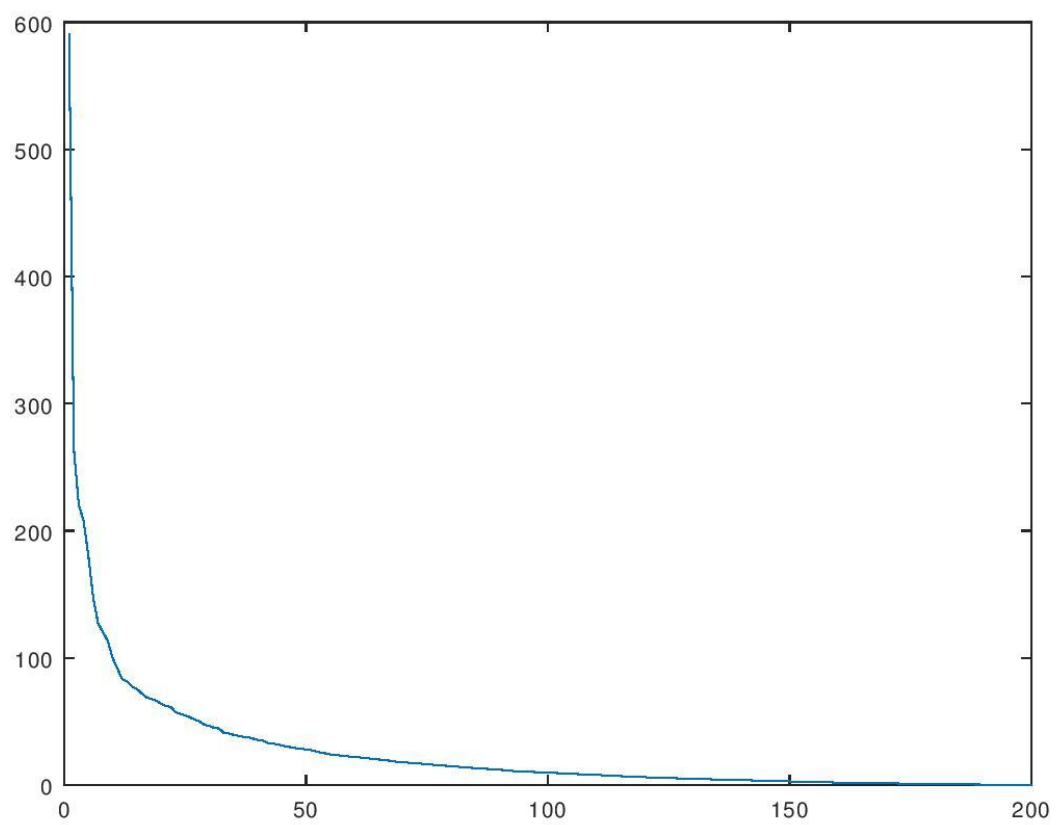


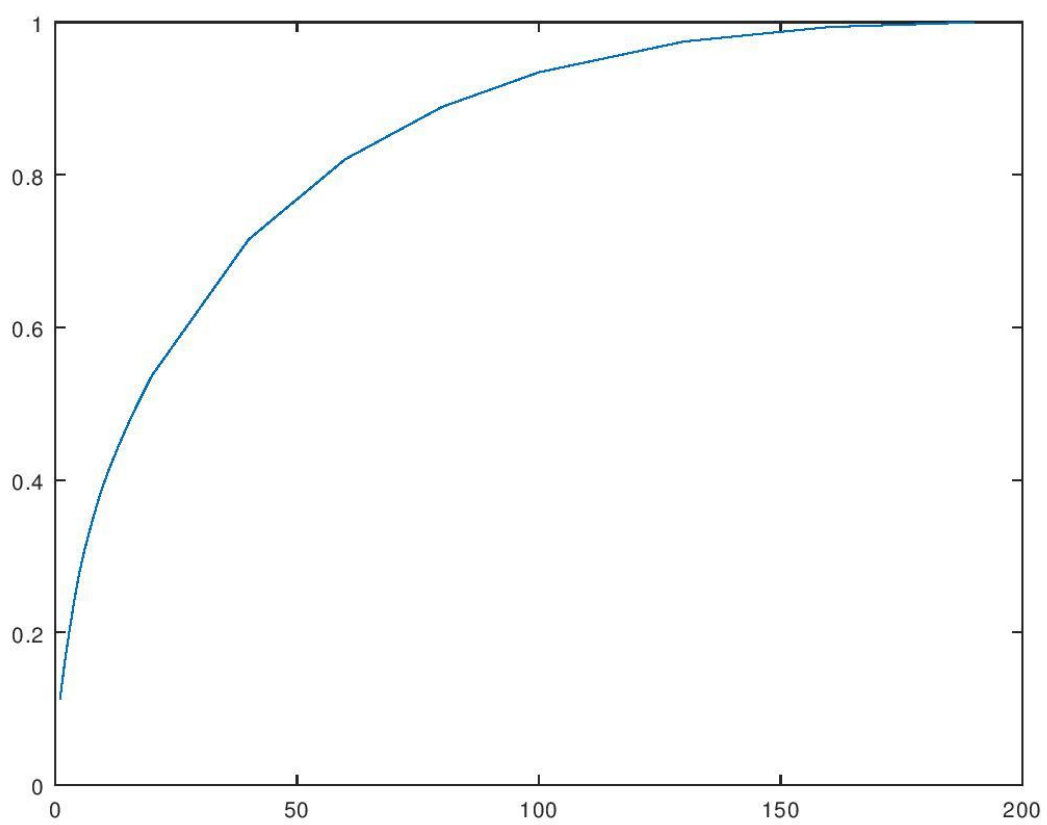


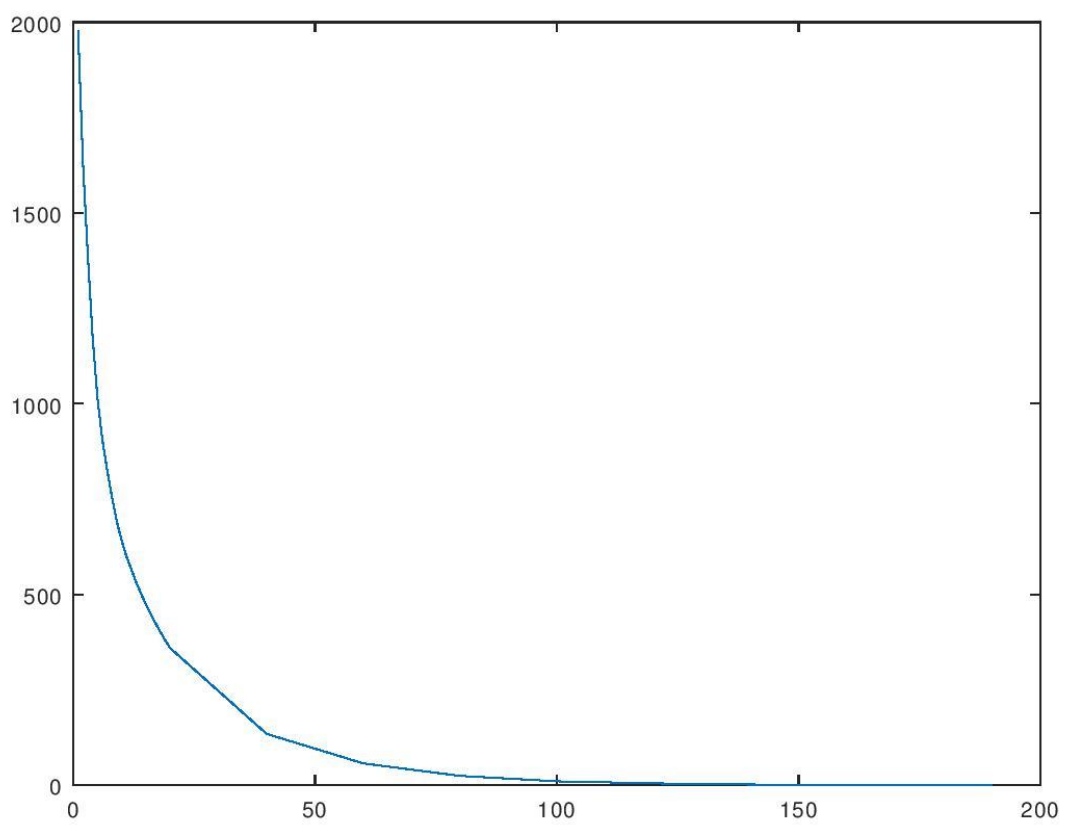


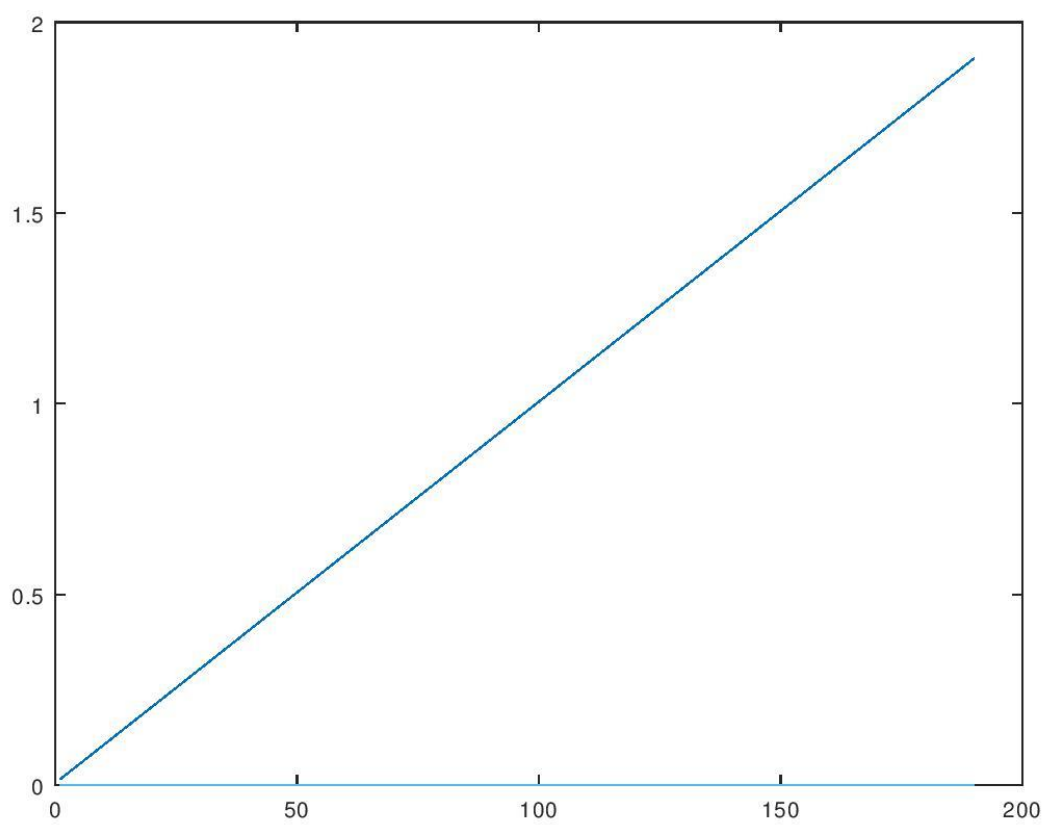
Grafice task5

Imaginea 1

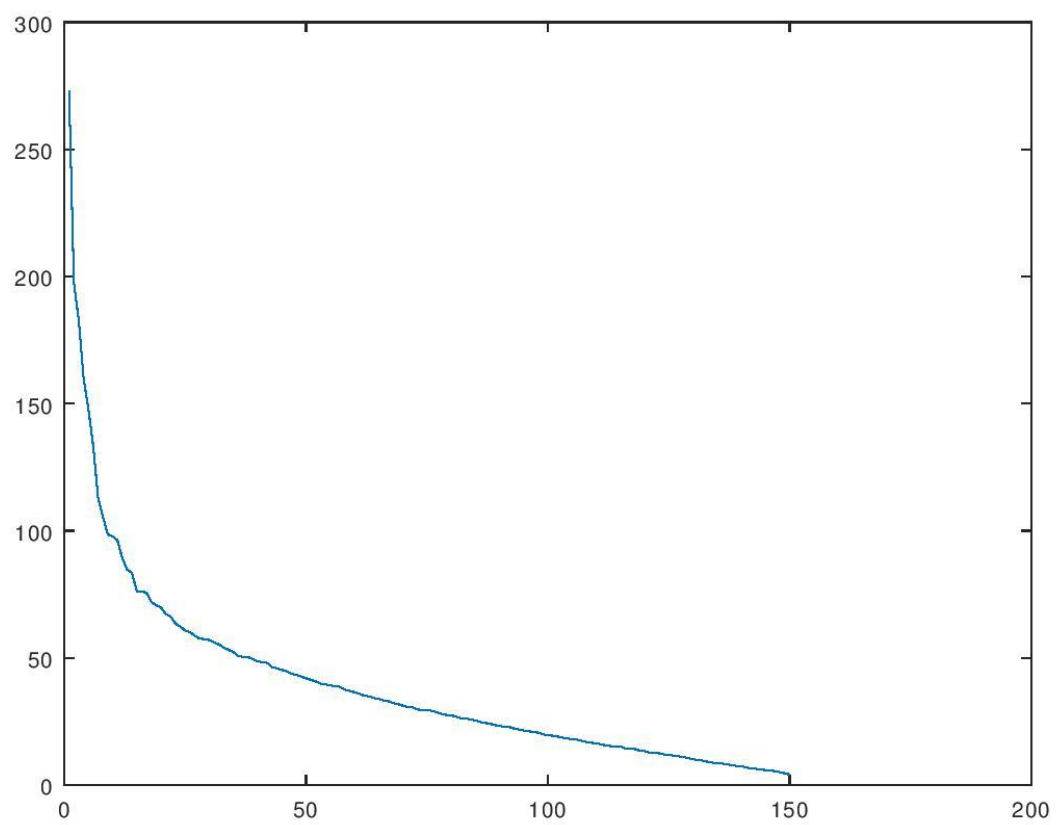


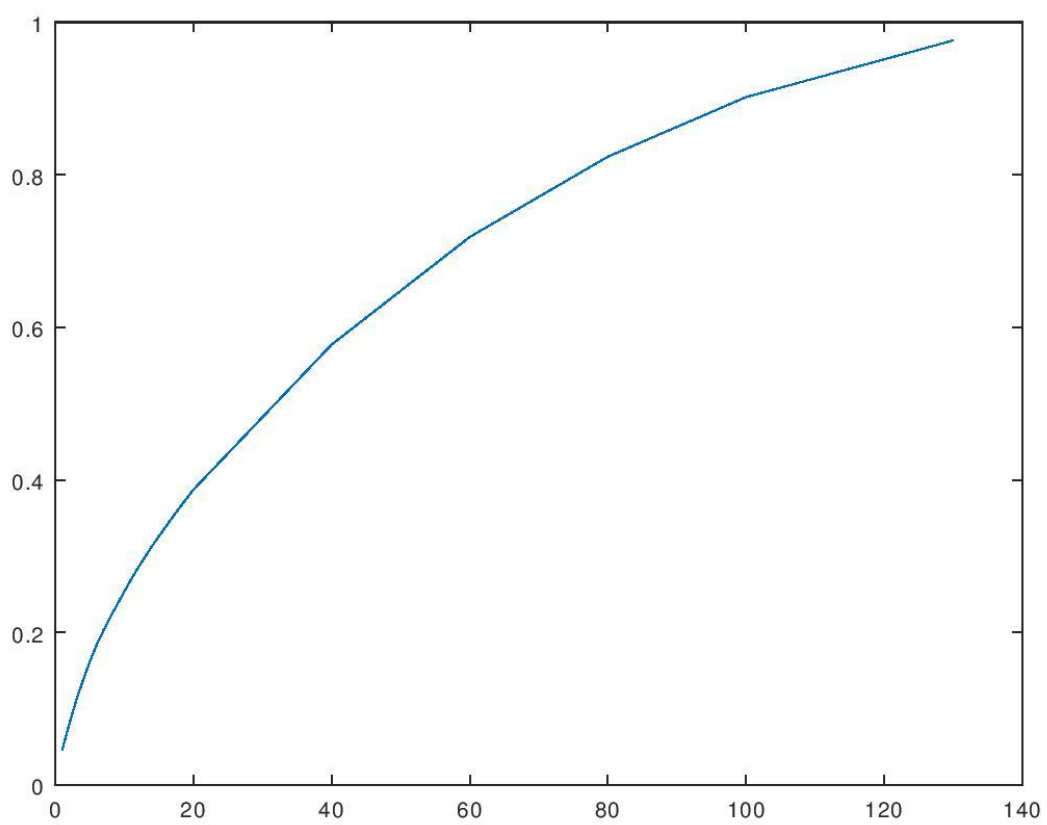


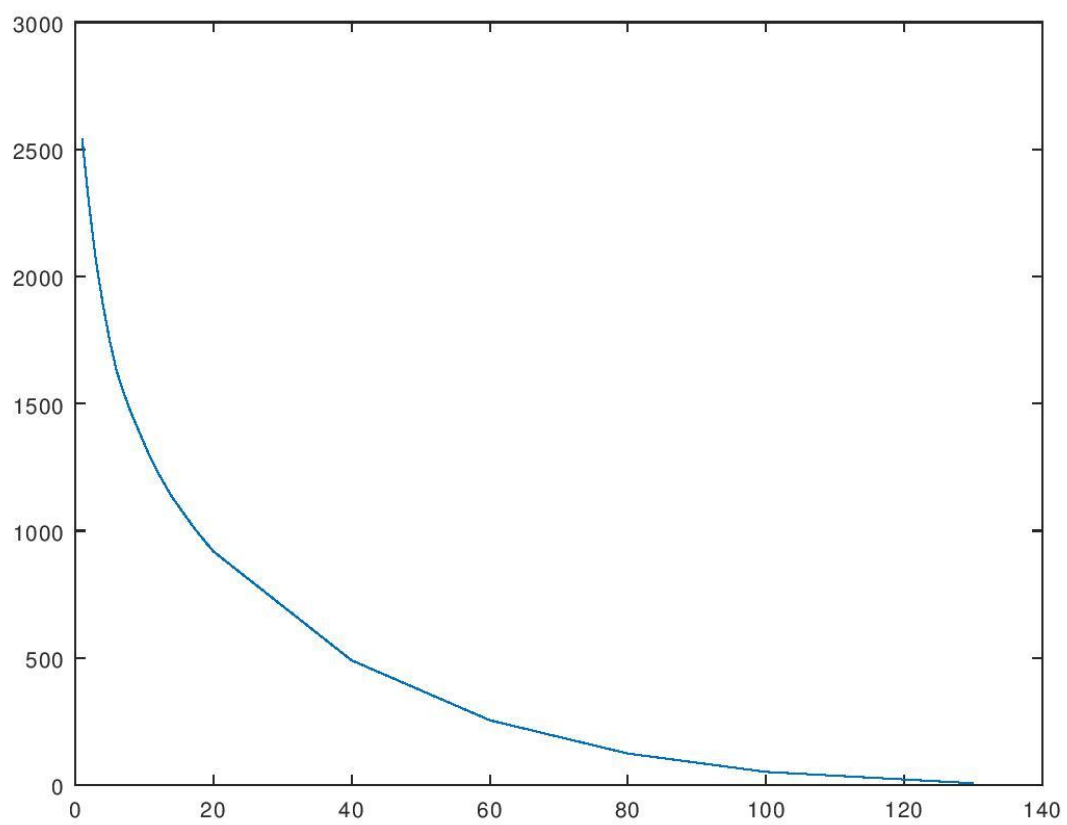




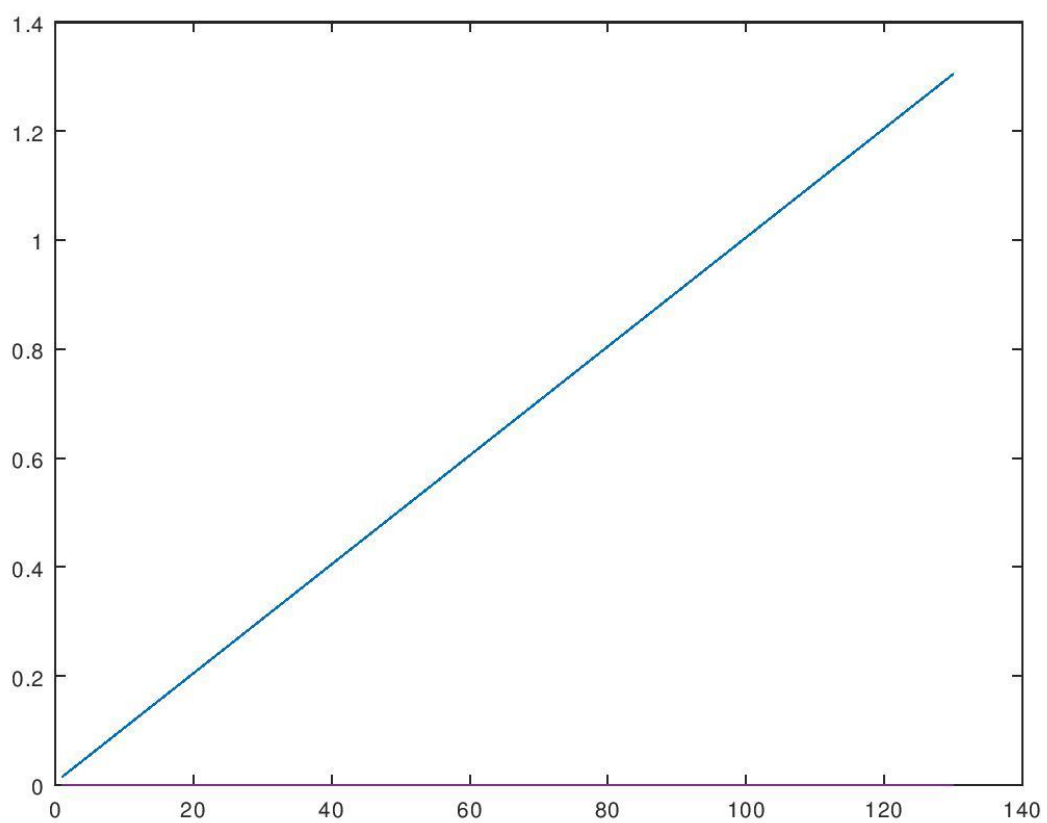
Imaginea 2



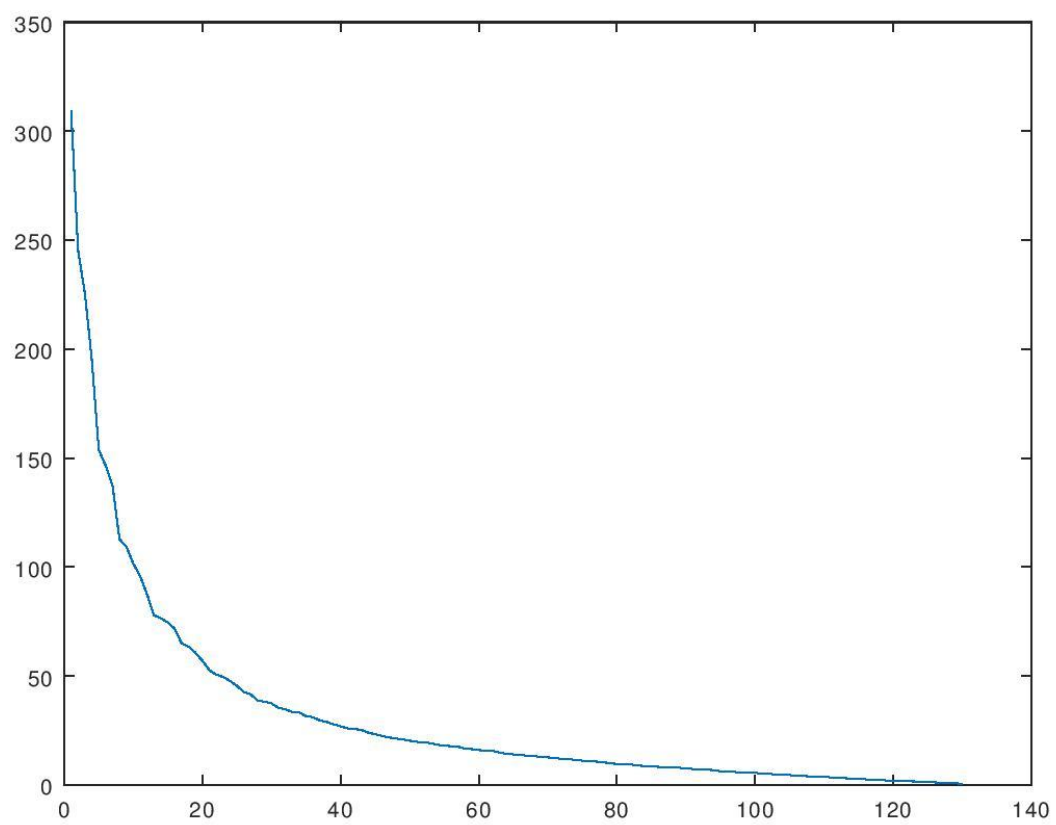


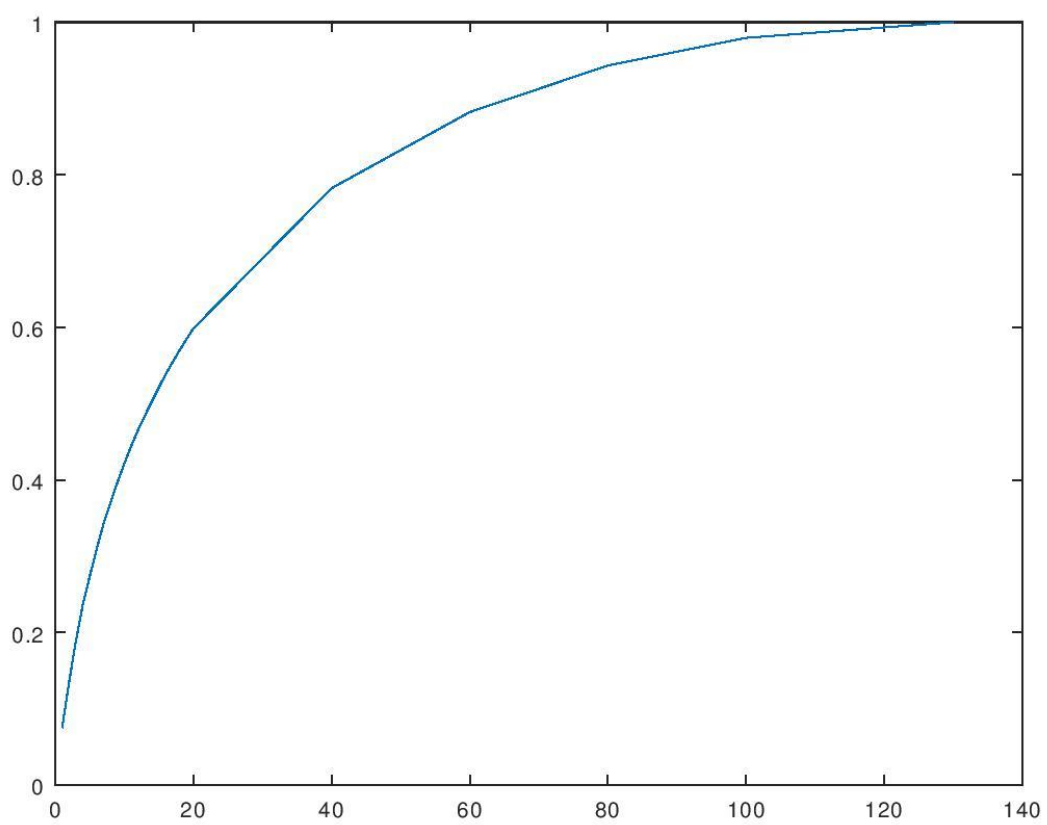


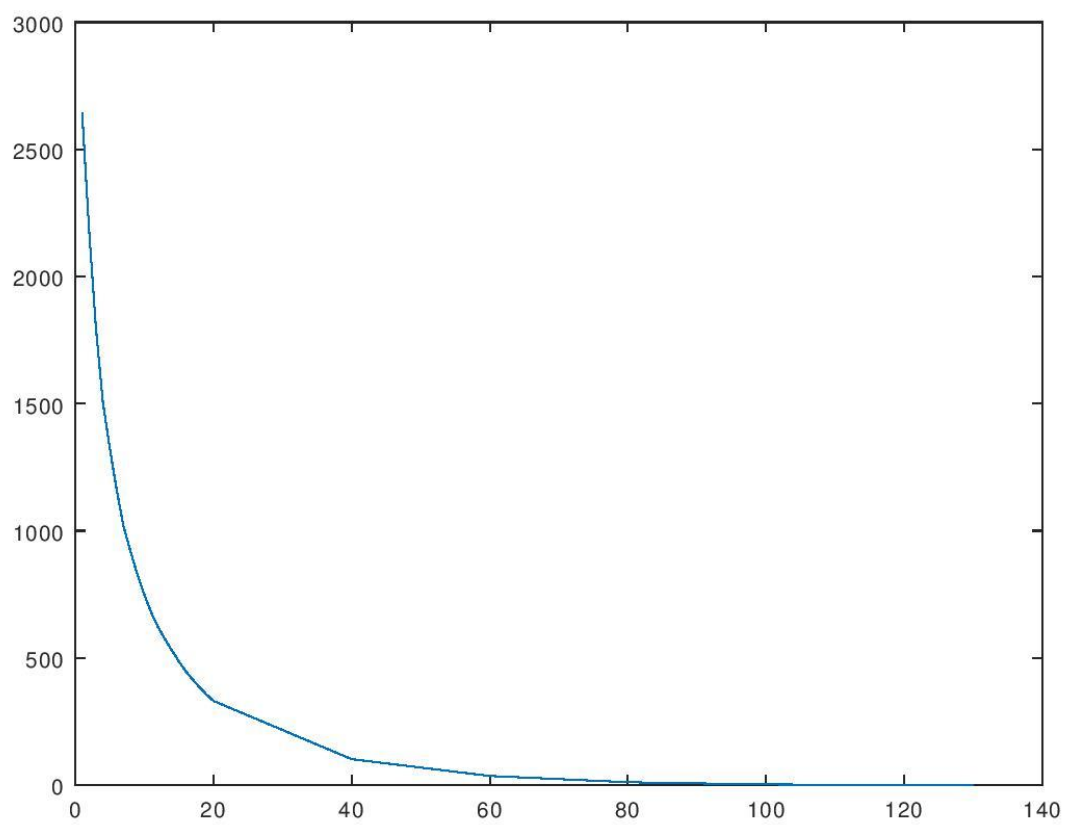


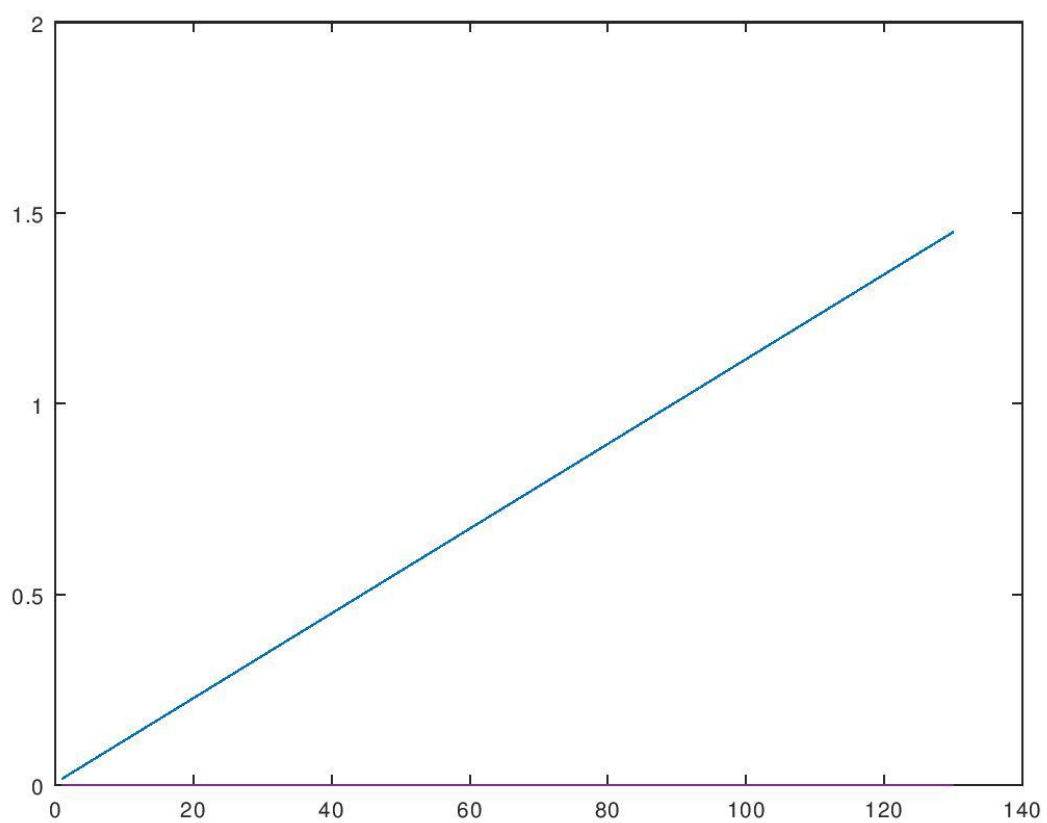


Imaginea 3









Imaginea 4

