README

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1 Introducere

Cerinta 1
Am citit matricea imaginii.Am descompus matricea folosind functia svd; Am eliminat valorile din matricea diagonala care nu sunt necesare compresiei si am reconstruit matricea.
Cerinta 2
Am citit matricea imaginii si am afisat valorile singulare(dupa ce am descompus matricea).La al doilea grafic am calculat informatia data de valorile singulare si am folosit functia plot pentru a reprezenta grafic.De asemenea,am reprezentat eroarea aproximarii calculata dupa formula data.Analog,am calculat si rata de compresie a datelor. Astfel cele 4 grafice pentru imaginea 2 , respectiv 3 sunt(unde figure si indicele arata numarul graficului):

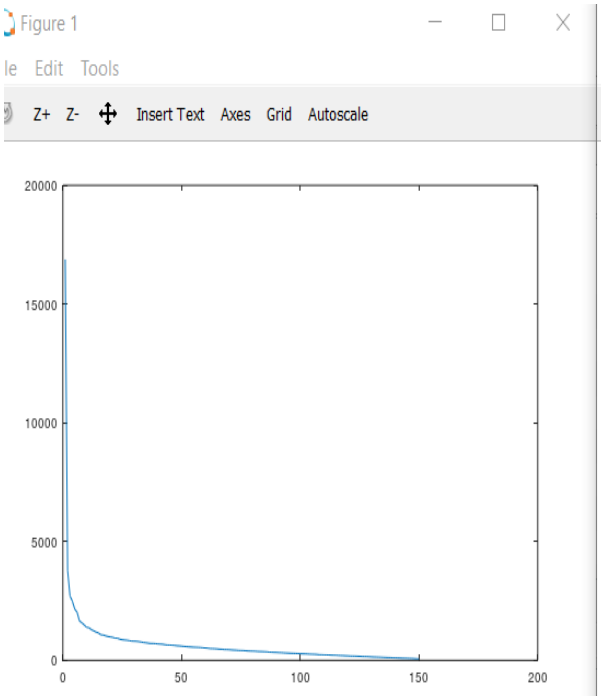
Figure 1
le Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
20000
15000
10000
5000
0
0 50 100 150 200

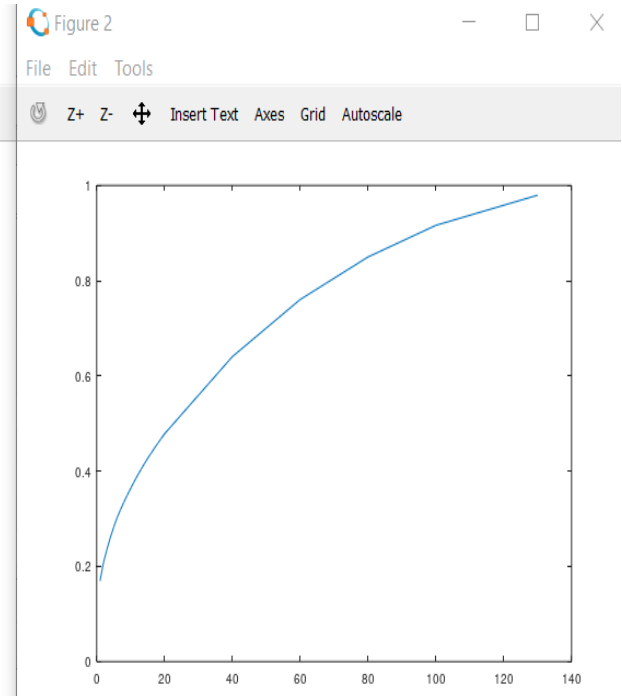
Figure 2
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
1
0.8
0.6
0.4
0.2
0
0 20 40 60 80 100 120 140

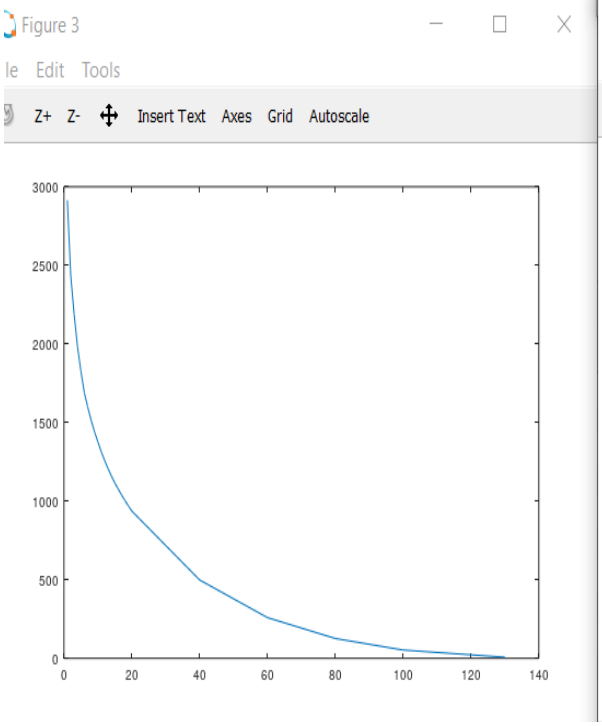
Figure 3
le Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
3000
2500
2000
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0 20 40 60 80 100 120 140

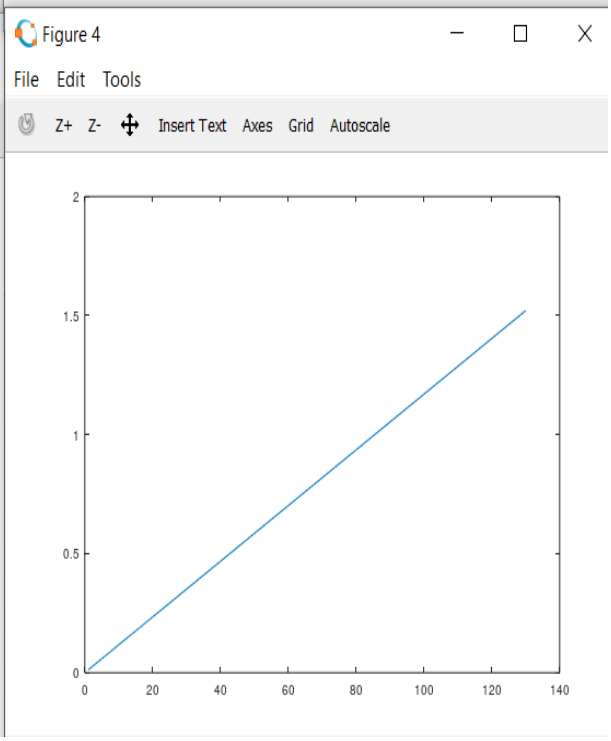
Figure 4
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
2
1.5
1
0.5
0
0 20 40 60 80 100 120 140

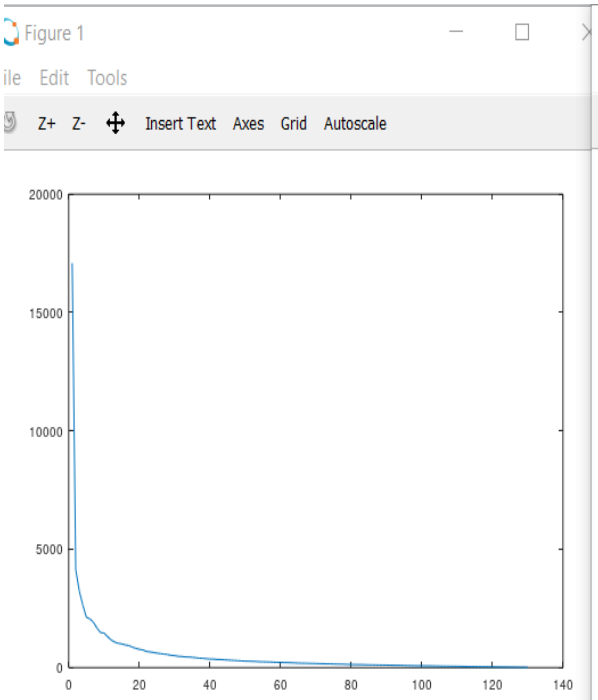
Figure 1
ile Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
20000
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0 20 40 60 80 100 120 140

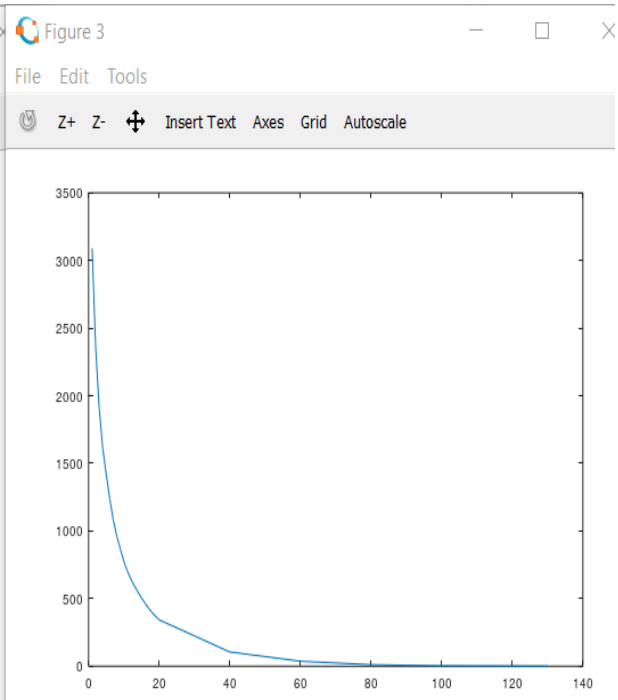
Figure 3
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
3500
3000
2500
2000
1500
1000
500
0
0 20 40 60 80 100 120 140

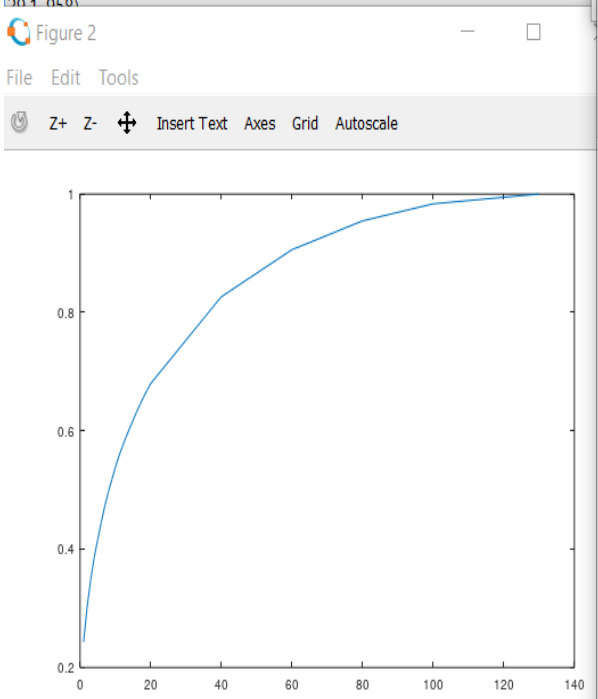
Figure 2
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
1
0.8
0.6
0.4
0.2
0 20 40 60 80 100 120 140

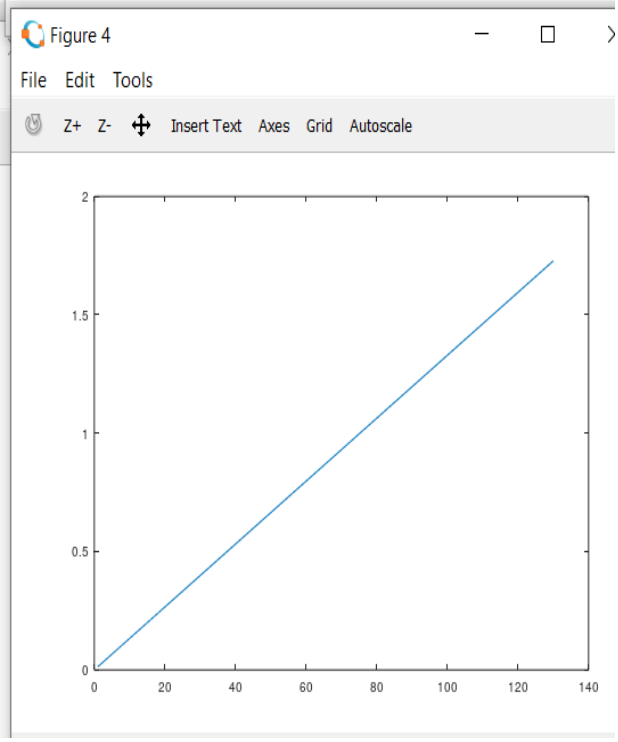
Figure 4
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
2
1.5
1
0.5
0
0 20 40 60 80 100 120 140

Cerinta 3
Am calculat media pentru fiecare vector.Am actualizat vectorii si am construit matricea Z.Am calculat DVS pentru noua matrice.Matricea W va fi reprezentata de primele k coloane din matricea V,iar matricea Y se va calcula dupa formula data.Se va aproxima matricea initiala.
Cerinta 4
Am repetat primii pasi din cerinta 3 , calculand matricea Z dupa noua formula. De asemenea am folosit in loc de functia eig,functia svd.Ultimii pasi sunt asemanatori cerintei 3.
Cerinta 5
Asemanator cerintei 2 am folosit formulele date pentru a reprezenta grafic vectorul diagonala,informatia data pentru cele k valori singulare,eroarea aproximarii si rata de compresie a datelor.Astfel cele 4 grafice pentru imaginea 2 , respectiv 3 sunt(unde figure si indicele arata numarul graficului):

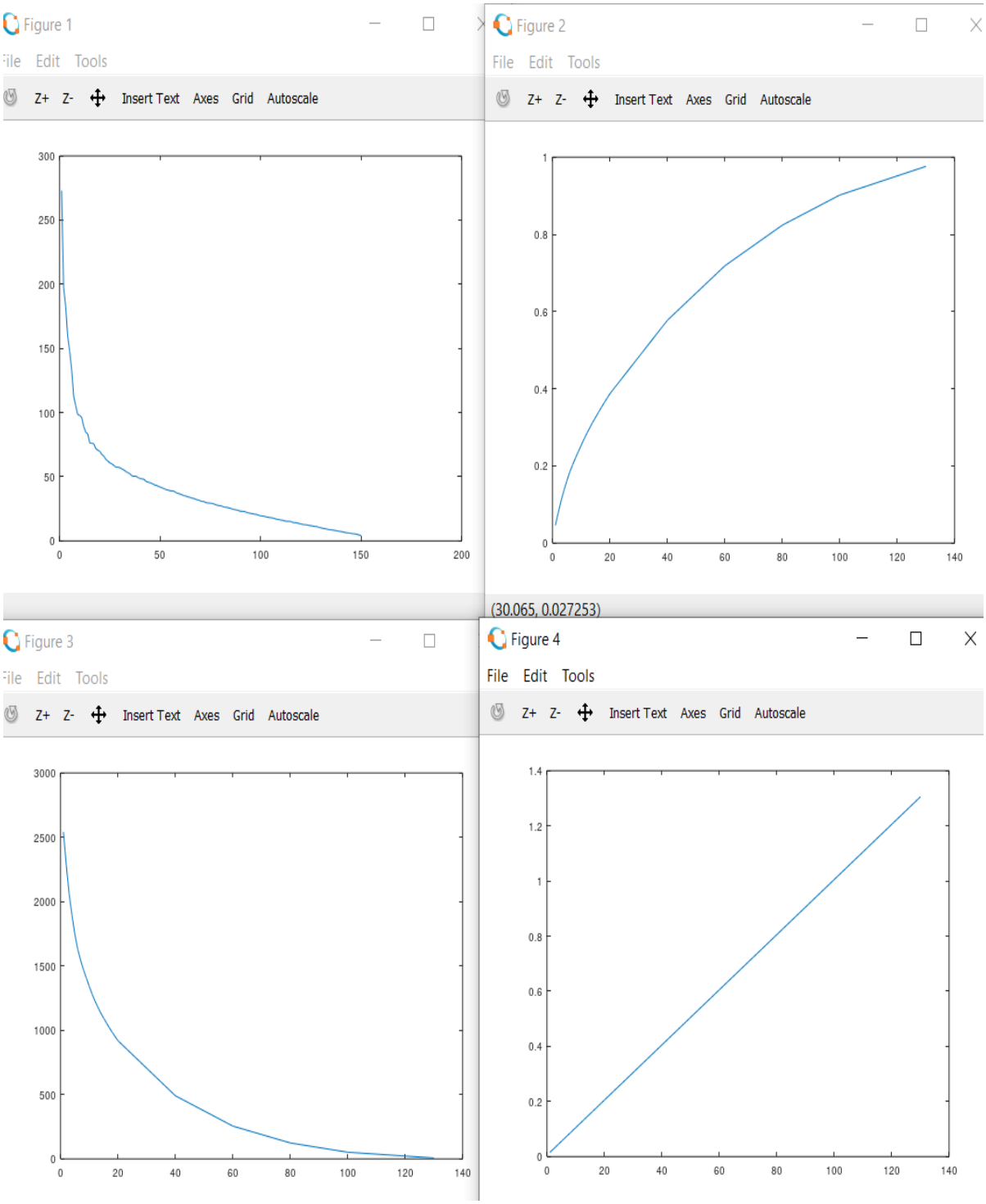
Figure 1
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
300
250
200
150
100
50
0
0 50 100 150 200
Figure 2
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
1
0.8
0.6
0.4
0.2
0
0 20 40 60 80 100 120 140
(30.065, 0.027253)
Figure 3
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
3000
2500
2000
1500
1000
500
0
0 20 40 60 80 100 120 140
Figure 4
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
1.4
1.2
1
0.8
0.6
0.4
0.2
0
0 20 40 60 80 100 120 140

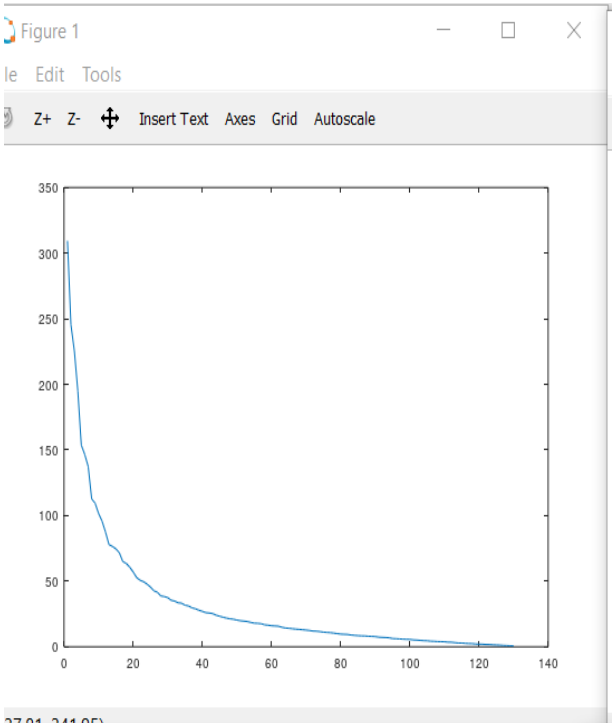
Figure 1
le Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
350
300
250
200
150
100
50
0
0 20 40 60 80 100 120 140
37.81, 341.95)

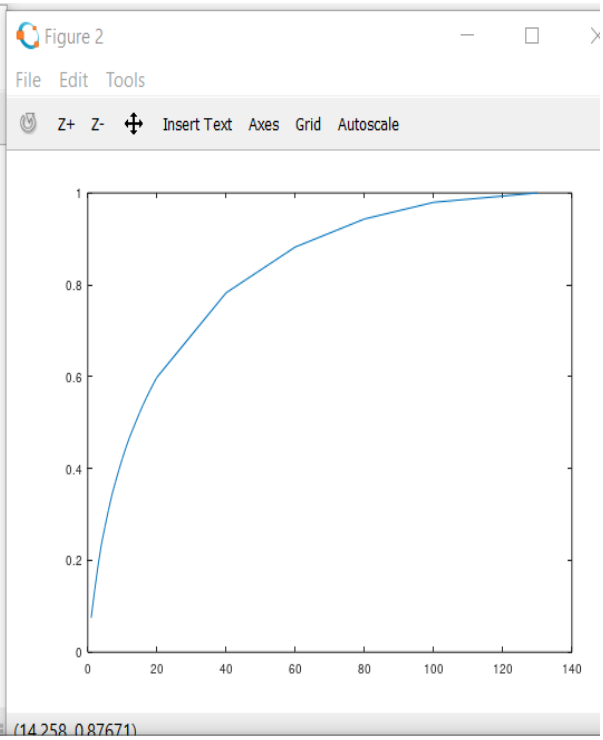
Figure 2
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
1
0.8
0.6
0.4
0.2
0
0 20 40 60 80 100 120 140

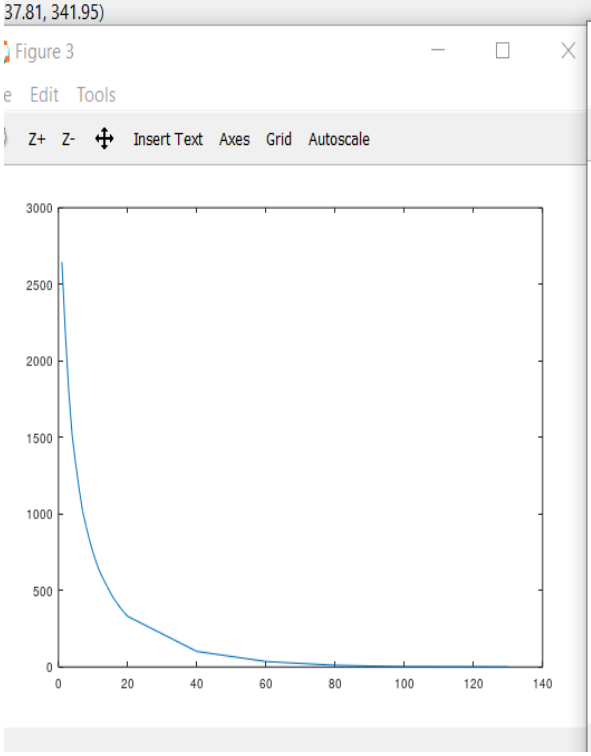
Figure 3
e Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
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0 20 40 60 80 100 120 140

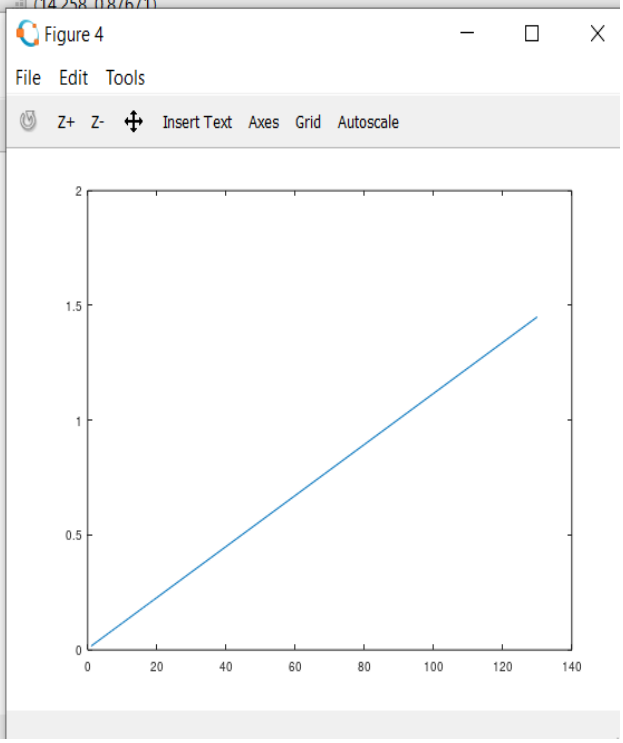
Figure 4
File Edit Tools
Z+ Z- Insert Text Axes Grid Autoscale
2
1.5
1
0.5
0
0 20 40 60 80 100 120 140

Cerinta 6
In functia eigenface-core, am citit fiecare imagine si am transformat-o intr-un vector coloana. Am construit astfel matricea T,unde fiecare coloana e o imagine.Am calculat media pentru fiecare linie din matricea T. De asemenea ,am calculat matricea A,apoi am descompus matricea X cu functia eig (unde X = A * A^T), calculand astfel matricea V(vectorii proprii corespunzatori valorilor proprii mai mari decat 1). Matricea fetelor va fi egala cu produsul dintre A si V.Am calculat apoi proiectia pentru fiecare imagine din multimea de imagini M.In functia face-recognition, am citit o imagine si am transformat-o in mod similar intr-un vector coloana.Am extras din ea media,calculandu-i proiectia.Am calculat distanta minima dintre proiectia imaginii de test si celelalte proiectii obtinute.Am gasit astfel distanta minima si indicele acesteia.