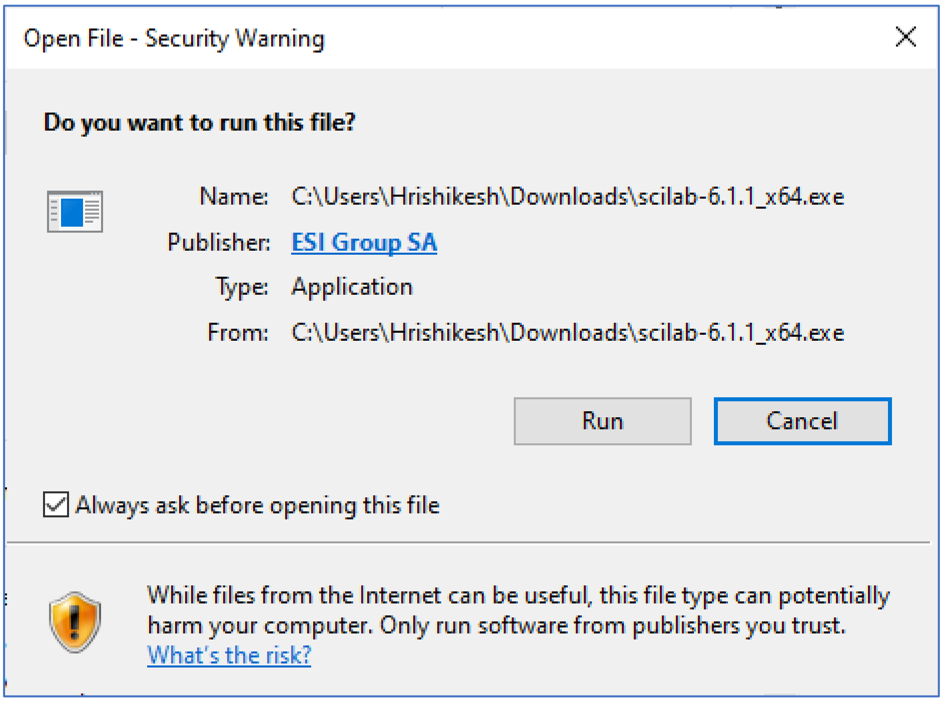
Practical No 0

Aim: Install the Scilab and Image Processing Toolbox in Scilab.

Step

1: Download scilab.6.1.1 https://www.scilab.org/download/scilab-6.1.1



Open File - Security Warning

Do you want to run this file?

Name: C:\Users\Hrishikesh\Downloads\scilab-6.1.1_x64.exe

Publisher: ESI Group SA

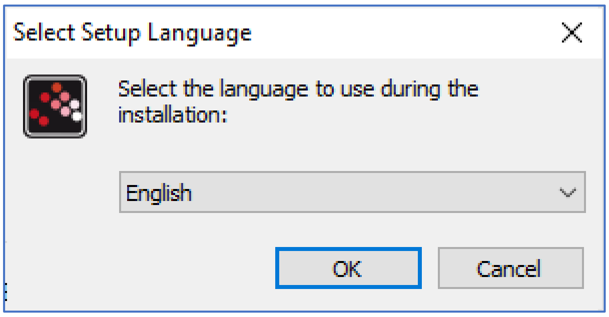
Type: Application

From: C:\Users\Hrishikesh\Downloads\scilab-6.1.1_x64.exe

☑ Always ask before opening this file

While files from the Internet can be useful, this file type can potentially harm your computer. Only run software from publishers you trust. What's the risk?

2: Select setup language as English. And click on OK.

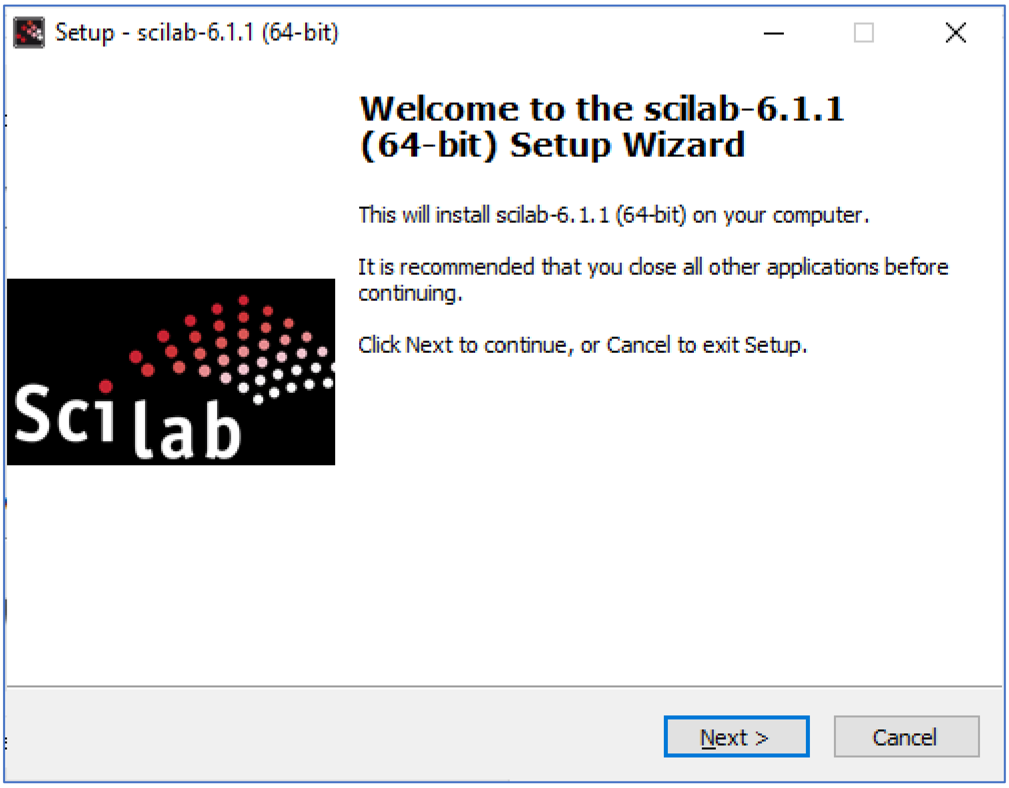


Select Setup Language

Select the language to use during the installation:

English

3: Click Next to continue.



Setup - scilab-6.1.1 (64-bit)

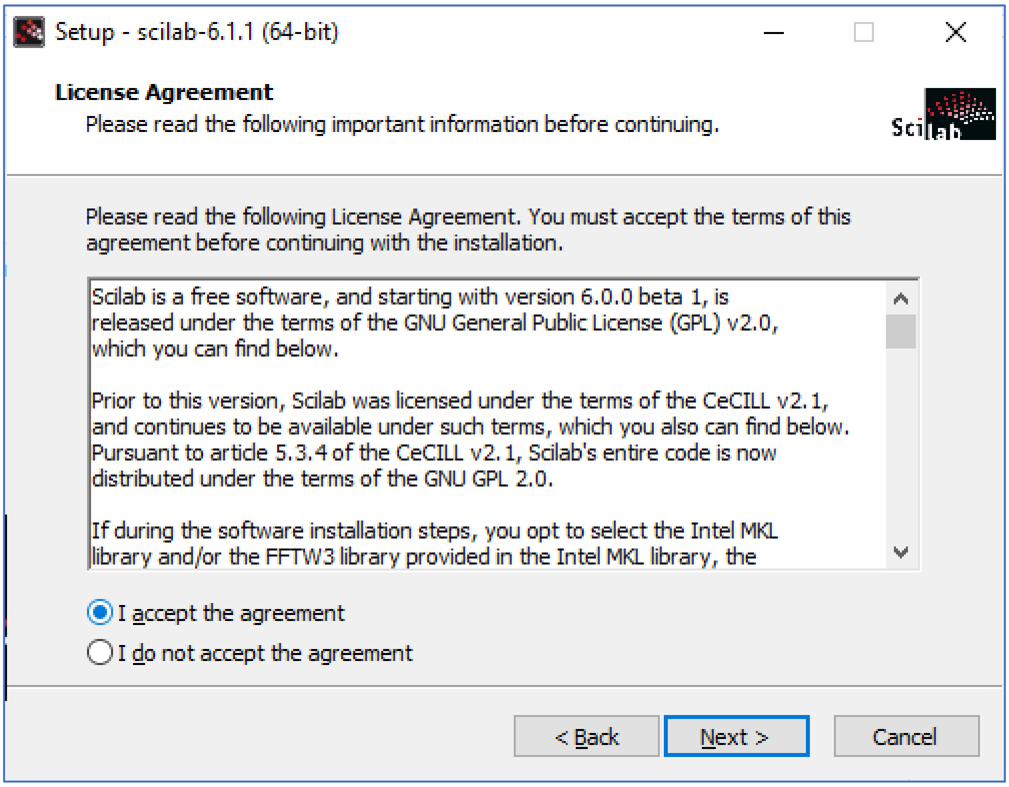
Welcome to the scilab-6.1.1 (64-bit) Setup Wizard

This will install scilab-6.1.1 (64-bit) on your computer.

It is recommended that you close all other applications before continuing.

Click Next to continue, or Cancel to exit Setup.

Accept the agreement and click on next button.



Setup - scilab-6.1.1 (64-bit)

License Agreement

Please read the following important information before continuing.

Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.

Scilab is a free software, and starting with version 6.0.0 beta 1, is released under the terms of the GNU General Public License (GPL) v2.0, which you can find below.

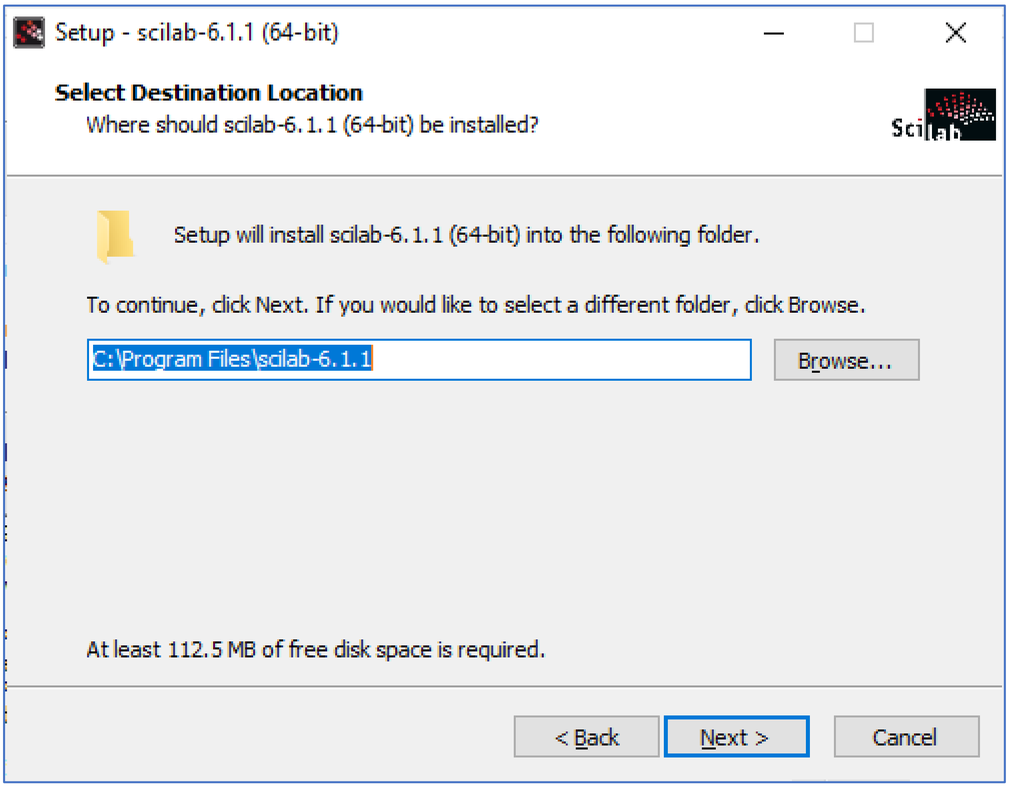
Prior to this version, Scilab was licensed under the terms of the CeCILL v2.1, and continues to be available under such terms, which you also can find below. Pursuant to article 5.3.4 of the CeCILL v2.1, Scilab's entire code is now distributed under the terms of the GNU GPL 2.0.

If during the software installation steps, you opt to select the Intel MKL library and/or the FFTW3 library provided in the Intel MKL library, the

● I accept the agreement

○ I do not accept the agreement

Click on next.



Setup - scilab-6.1.1 (64-bit)

Select Destination Location

Where should scilab-6.1.1 (64-bit) be installed?

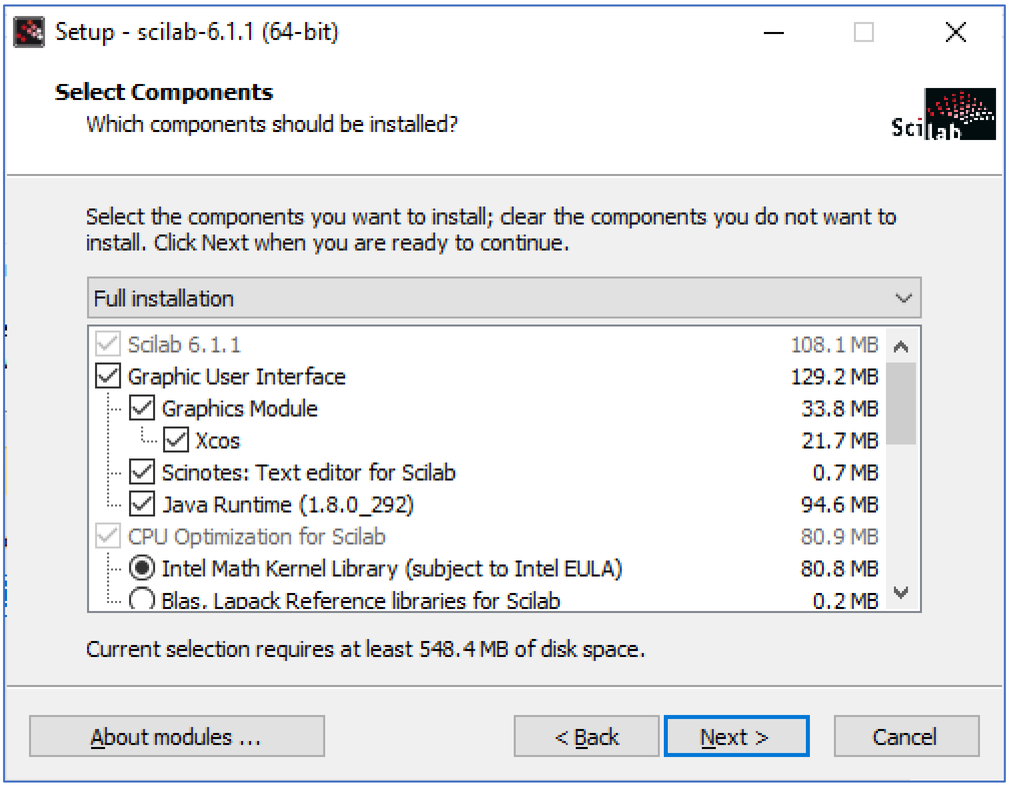
Setup will install scilab-6.1.1 (64-bit) into the following folder.

To continue, click Next. If you would like to select a different folder, click Browse.

C:\Program Files\scilab-6.1.1

At least 112.5 MB of free disk space is required.

Keep the by default settings as it is and click on next.



Setup - scilab-6.1.1 (64-bit)

Select Components

Which components should be installed?

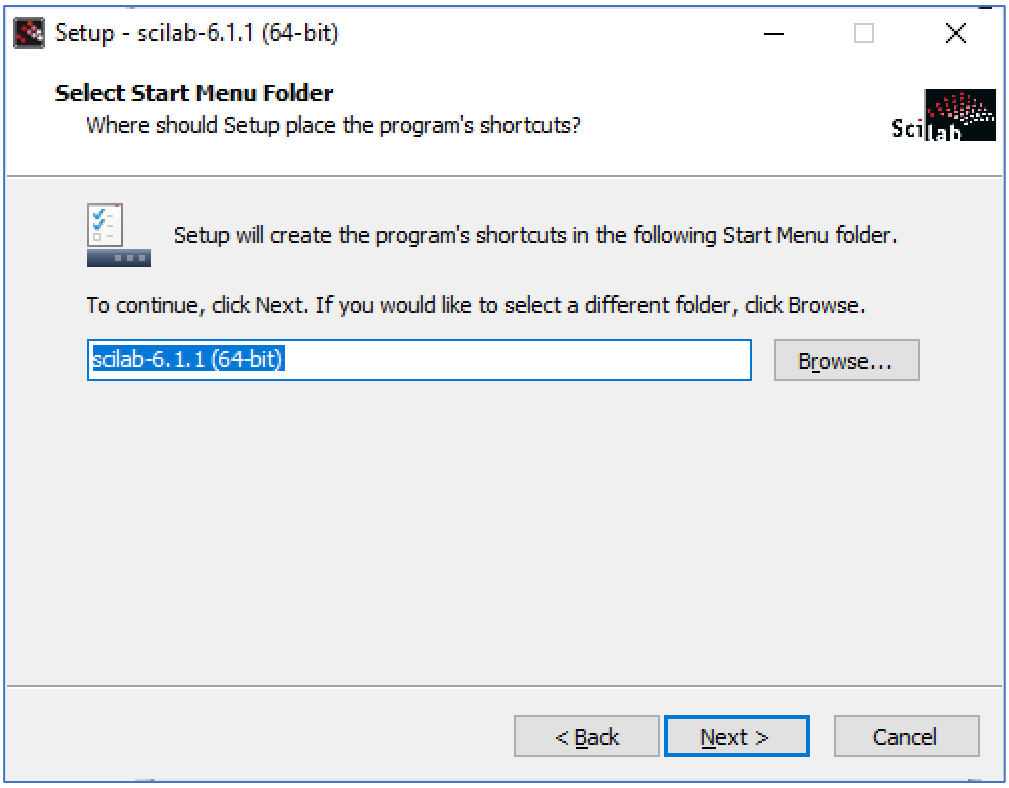
Select the components you want to install; clear the components you do not want to install. Click Next when you are ready to continue.

Full installation

☑ Scilab 6.1.1	108.1 MB
☑ Graphic User Interface	129.2 MB
☑ Graphics Module	33.8 MB
☑ Xcos	21.7 MB
☑ Scinotes: Text editor for Scilab	0.7 MB
☑ Java Runtime (1.8.0_292)	94.6 MB
☑ CPU Optimization for Scilab	80.9 MB
● Intel Math Kernel Library (subject to Intel EULA)	80.8 MB
○ Blas, Lapack Reference libraries for Scilab	0.2 MB

Current selection requires at least 548.4 MB of disk space.

Click on next.



Setup - scilab-6.1.1 (64-bit)

Select Start Menu Folder

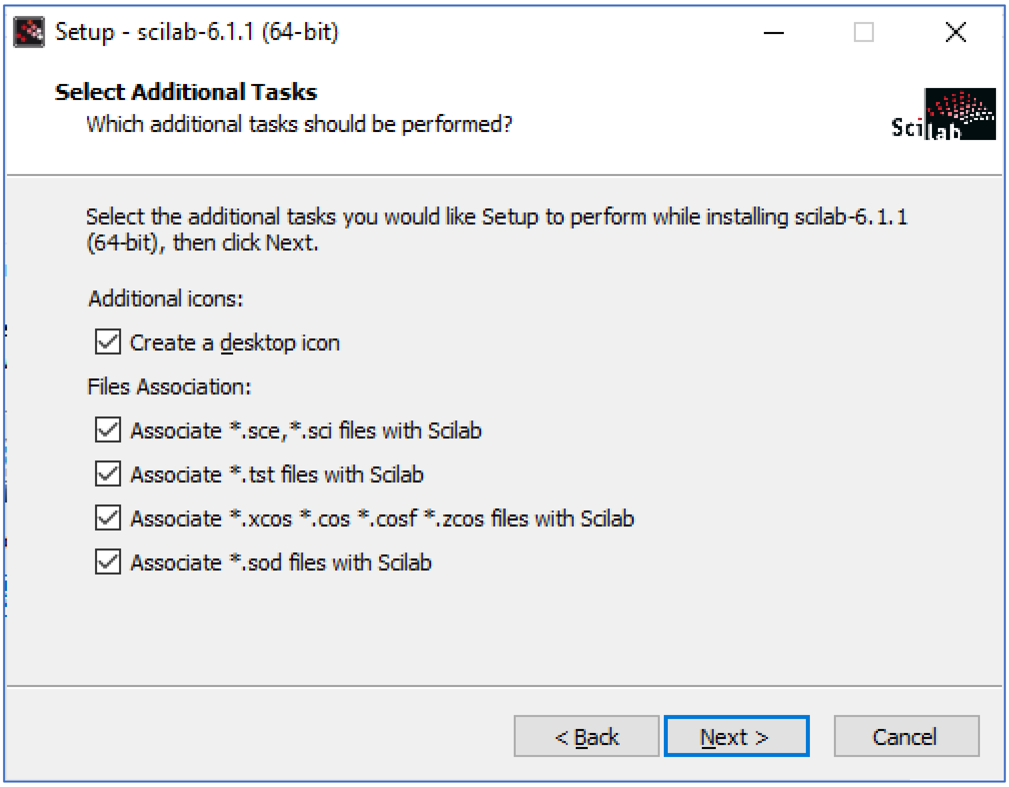
Where should Setup place the program's shortcuts?

Setup will create the program's shortcuts in the following Start Menu folder.

To continue, click Next. If you would like to select a different folder, click Browse.

scilab-6.1.1 (64-bit)

Keep the by default settings as it is and click on next.



Setup - scilab-6.1.1 (64-bit)

Select Additional Tasks

Which additional tasks should be performed?

Select the additional tasks you would like Setup to perform while installing scilab-6.1.1 (64-bit), then click Next.

Additional icons:

☑ Create a desktop icon

Files Association:

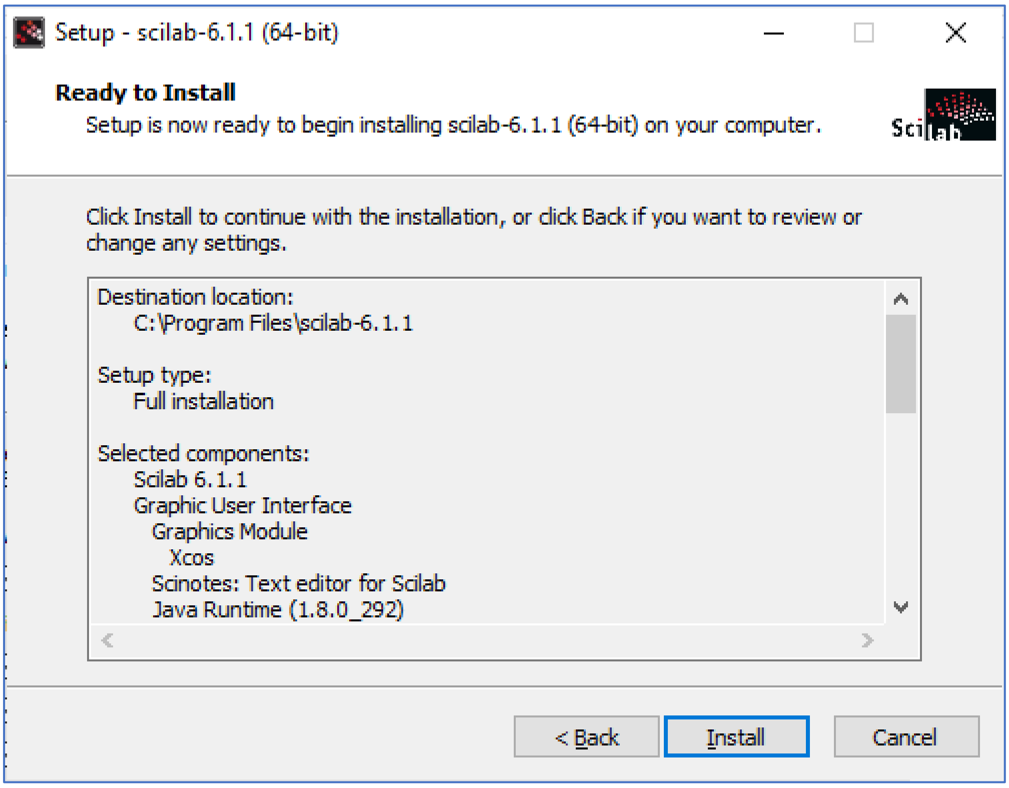
☑ Associate *.sce,*.sci files with Scilab

☑ Associate *.tst files with Scilab

☑ Associate *.xcos *.cos *.cosf *.zcos files with Scilab

☑ Associate *.sod files with Scilab

Click on Install.



Ready to Install

Setup is now ready to begin installing scilab-6.1.1 (64-bit) on your computer.

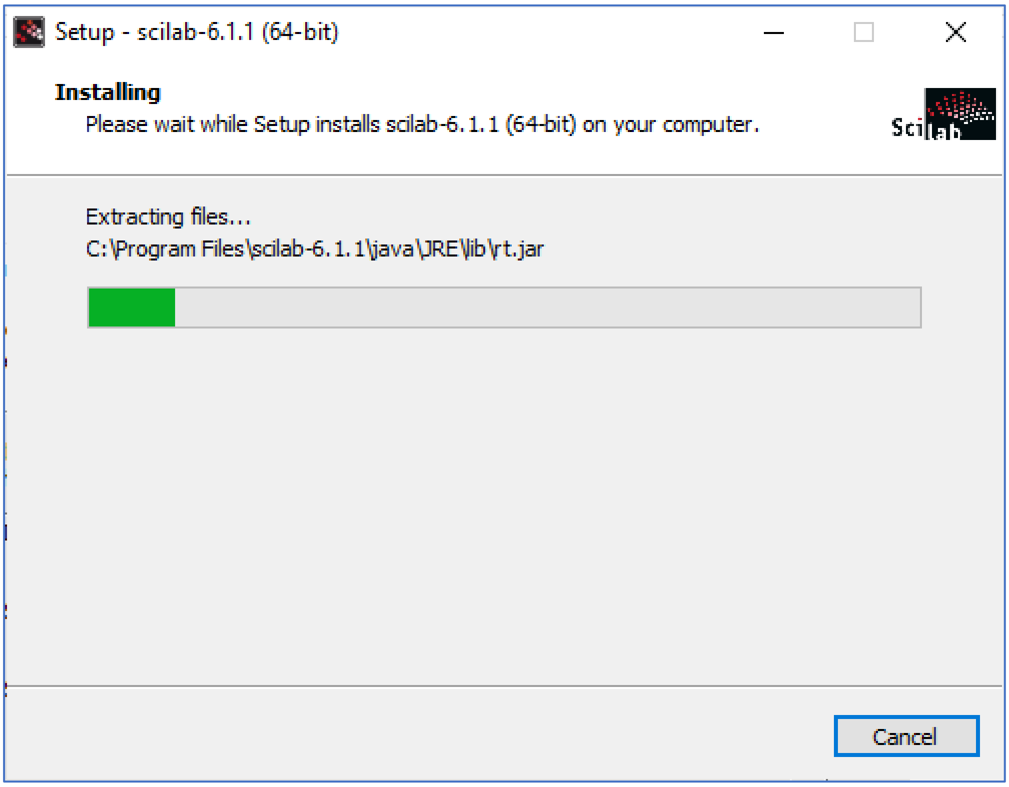
Click Install to continue with the installation, or click Back if you want to review or change any settings.

```
Destination location:
    C:\Program Files\scilab-6.1.1

Setup type:
    Full installation

Selected components:
    Scilab 6.1.1
    Graphic User Interface
      Graphics Module
        Xcos
      Scinotes: Text editor for Scilab
      Java Runtime (1.8.0_292)
```

Installation process will start.

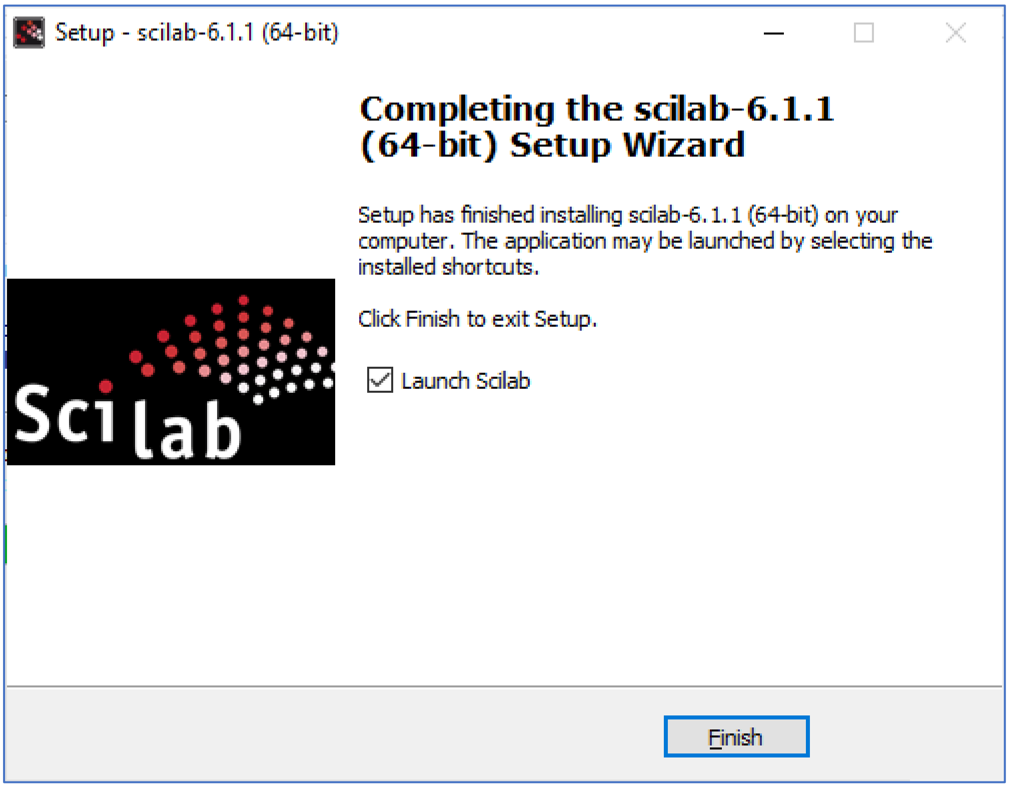


Installing

Please wait while Setup installs scilab-6.1.1 (64-bit) on your computer.

```
Extracting files...
C:\Program Files\scilab-6.1.1\java\JRE\lib\rt.jar
```

Click on Finish to exit Setup.

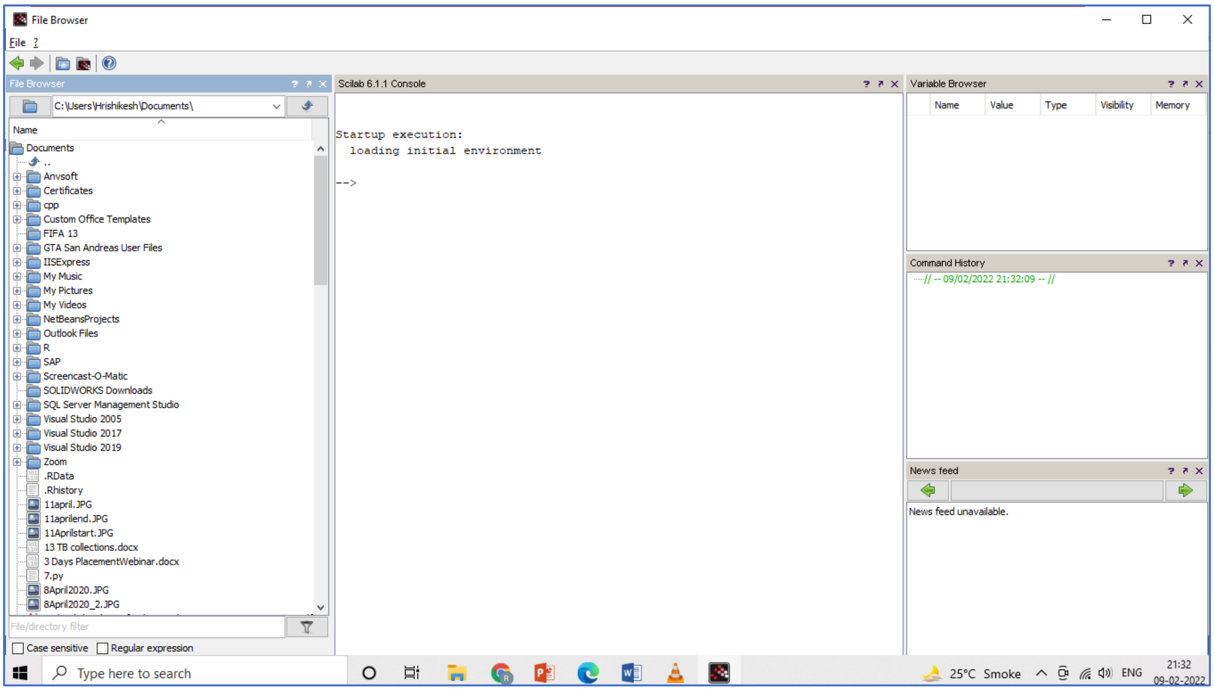


Completing the scilab-6.1.1 (64-bit) Setup Wizard

Setup has finished installing scilab-6.1.1 (64-bit) on your computer. The application may be launched by selecting the installed shortcuts.

Click Finish to exit Setup.

☑ Launch Scilab



C:\Users\Hrishikesh\Documents\

Name

- Documents
  - ..
  - Anvsoft
  - Certificates
  - cpp
  - Custom Office Templates
  - FIFA 13
  - GTA San Andreas User Files
  - IISExpress
  - My Music
  - My Pictures
  - My Videos
  - NetBeansProjects
  - Outlook Files
  - R
  - SAP
  - Screencast-O-Matic
  - SOLIDWORKS Downloads
  - SQL Server Management Studio
  - Visual Studio 2005
  - Visual Studio 2017
  - Visual Studio 2019
  - Zoom
  - .RData
  - .Rhistory
  - 11april.JPG
  - 11aprilend.JPG
  - 11Aprilstart.JPG
  - 13 TB collections.docx
  - 3 Days PlacementWebinar.docx
  - 7.py
  - 8April2020.JPG
  - 8April2020_2.JPG

File/directory filter

□ Case sensitive □ Regular expression

```
Startup execution:
  loading initial environment

-->
```

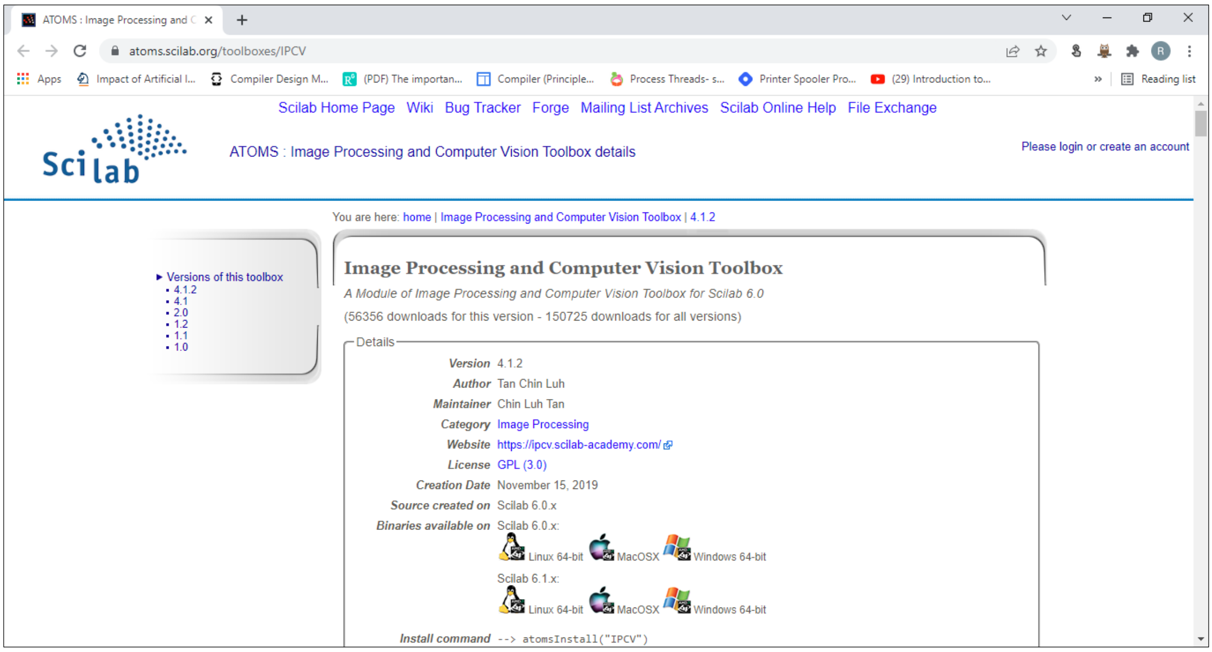
Name	Value	Type	Visibility	Memory

// -- 09/02/2022 21:32:09 -- //

News feed unavailable.

Download IPCV zip file

https://atoms.scilab.org/toolboxes/IPCV



ATOMS : Image Processing and Computer Vision Toolbox details

You are here: home | Image Processing and Computer Vision Toolbox | 4.1.2

Versions of this toolbox
- 4.1.2
- 4.1
- 2.0
- 1.2
- 1.1
- 1.0

Image Processing and Computer Vision Toolbox

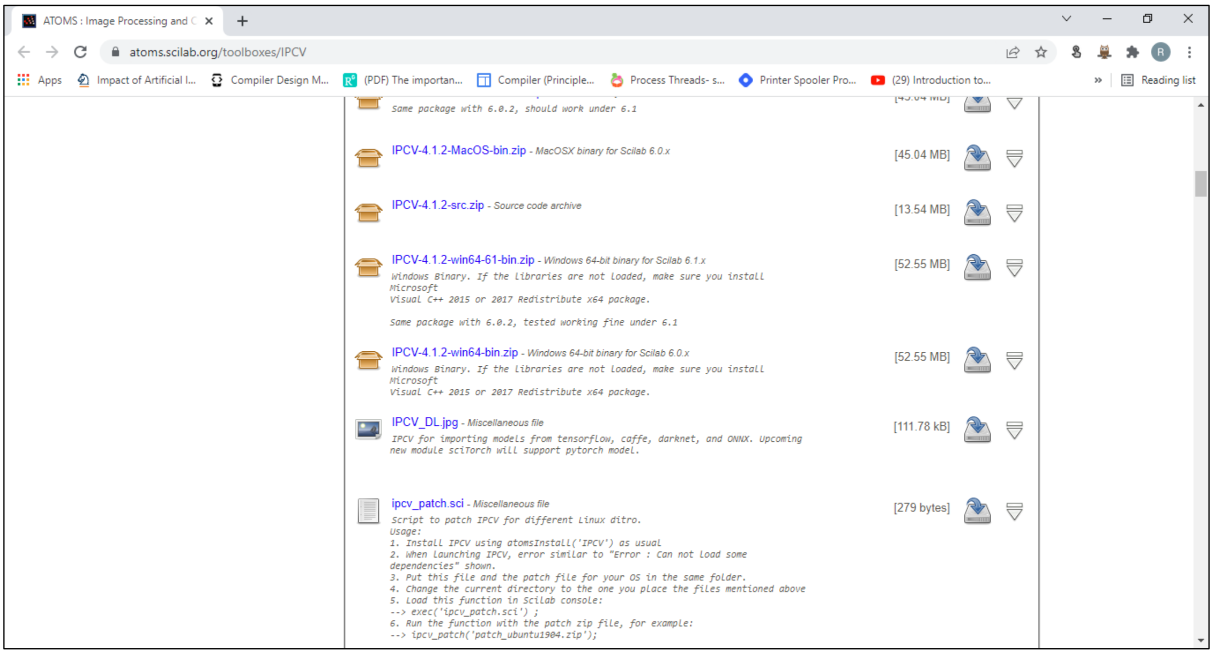
A Module of Image Processing and Computer Vision Toolbox for Scilab 6.0

(56356 downloads for this version - 150725 downloads for all versions)

Details

Version	4.1.2
Author	Tan Chin Luh
Maintainer	Chin Luh Tan
Category	Image Processing
Website	https://ipcv.scilab-academy.com/
License	GPL (3.0)
Creation Date	November 15, 2019
Source created on	Scilab 6.0.x
Binaries available on	Scilab 6.0.x: Linux 64-bit MacOSX Windows 64-bit Scilab 6.1.x: Linux 64-bit MacOSX Windows 64-bit
Install command	`--> atomsInstall("IPCV")`

Download IPVC-X.X.X for respective windows OS and Scilab version.



Same package with 6.0.2, should work under 6.1

IPCV-4.1.2-MacOS-bin.zip - *MacOSX binary for Scilab 6.0.x* [45.04 MB]

IPCV-4.1.2-src.zip - *Source code archive* [13.54 MB]

IPCV-4.1.2-win64-61-bin.zip - *Windows 64-bit binary for Scilab 6.1.x* [52.55 MB]

*Windows Binary. If the libraries are not loaded, make sure you install Microsoft
Visual C++ 2015 or 2017 Redistribute x64 package.*

Same package with 6.0.2, tested working fine under 6.1

IPCV-4.1.2-win64-bin.zip - *Windows 64-bit binary for Scilab 6.0.x* [52.55 MB]

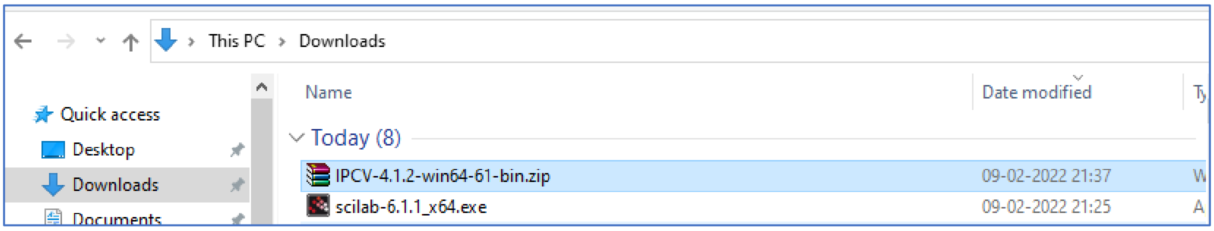
*Windows Binary. If the libraries are not loaded, make sure you install Microsoft
Visual C++ 2015 or 2017 Redistribute x64 package.*

IPCV_DL.jpg - *Miscellaneous file* [111.78 kB]

IPCV for importing models from tensorflow, caffe, darknet, and ONNX. Upcoming new module sciTorch will support pytorch model.

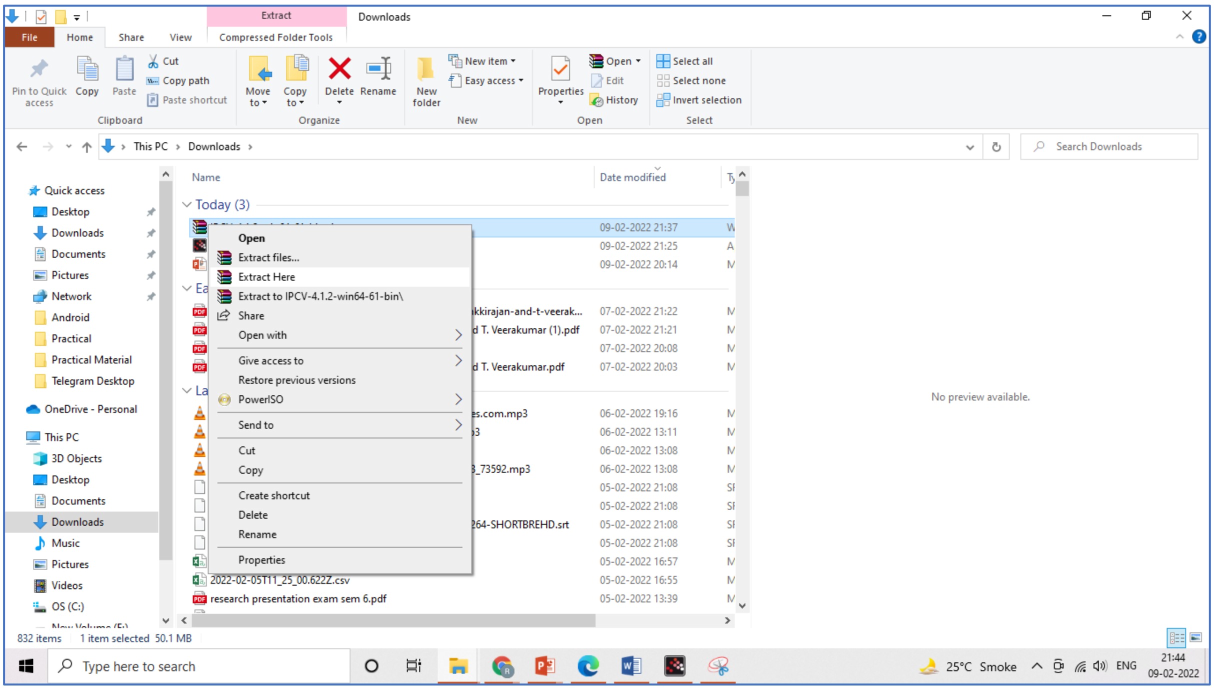
ipcv_patch.sci - *Miscellaneous file* [279 bytes]

```
Script to patch IPCV for different Linux ditro.
Usage:
1. Install IPCV using atomsInstall('IPCV') as usual
2. When launching IPCV, error similar to "Error : Can not load some
dependencies" shown.
3. Put this file and the patch file for your OS in the same folder.
4. Change the current directory to the one you place the files mentioned above
5. Load this function in Scilab console:
--> exec('ipcv_patch.sci') ;
6. Run the function with the patch zip file, for example:
--> ipcv_patch('patch_ubuntu1904.zip');
```

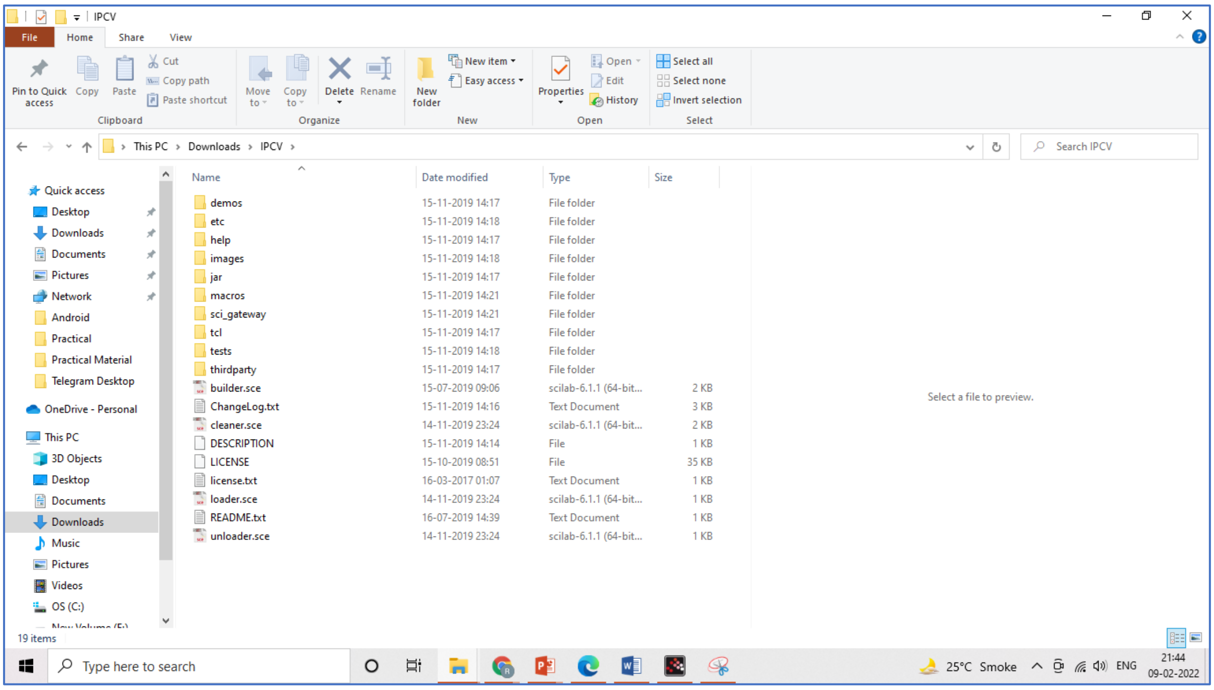


Name	Date modified	Ty
Today (8)		
IPCV-4.1.2-win64-61-bin.zip	09-02-2022 21:37	W
scilab-6.1.1_x64.exe	09-02-2022 21:25	A

Extract IPCV folder => Paste in scilab folder

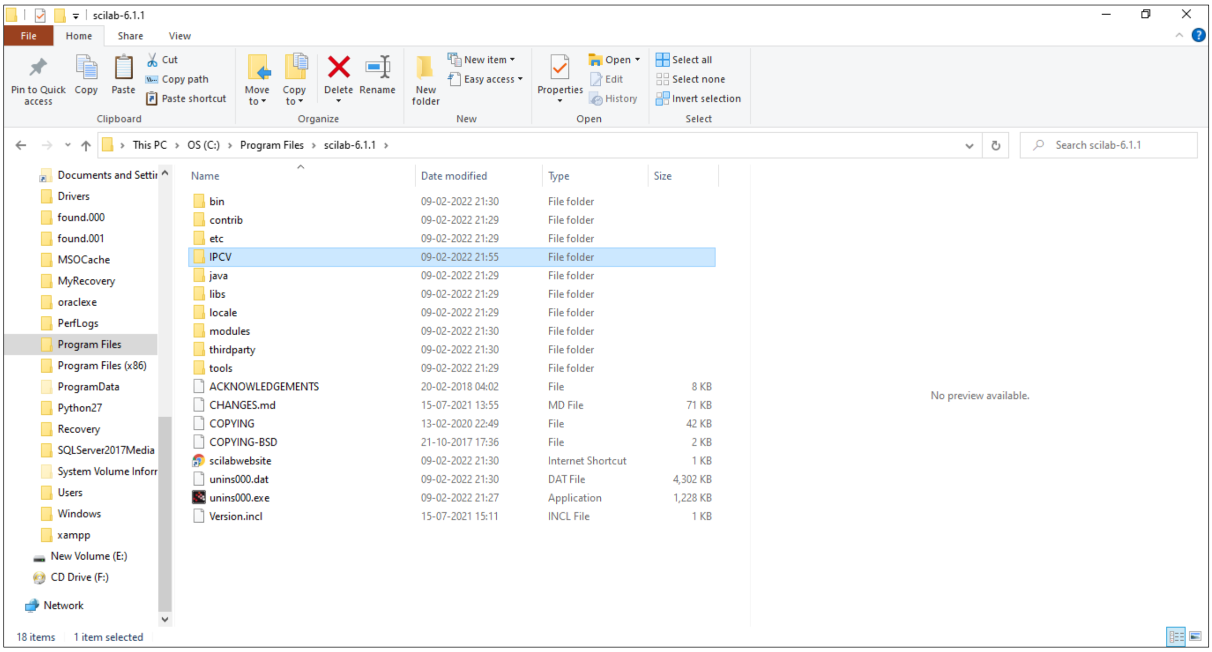


Name	Date modified
	09-02-2022 21:37
	09-02-2022 21:25
	09-02-2022 20:14
...kkirajan-and-t-veerak...	07-02-2022 21:22
...d T. Veerakumar (1).pdf	07-02-2022 21:21
	07-02-2022 20:08
...d T. Veerakumar.pdf	07-02-2022 20:03
...s.com.mp3	06-02-2022 19:16
...3	06-02-2022 13:11
	06-02-2022 13:08
...3_73592.mp3	06-02-2022 13:08
	05-02-2022 21:08
	05-02-2022 21:08
...264-SHORTBREHD.srt	05-02-2022 21:08
	05-02-2022 21:08
	05-02-2022 16:57
2022-02-05T11_25_00.622Z.csv	05-02-2022 16:55
research presentation exam sem 6.pdf	05-02-2022 13:39



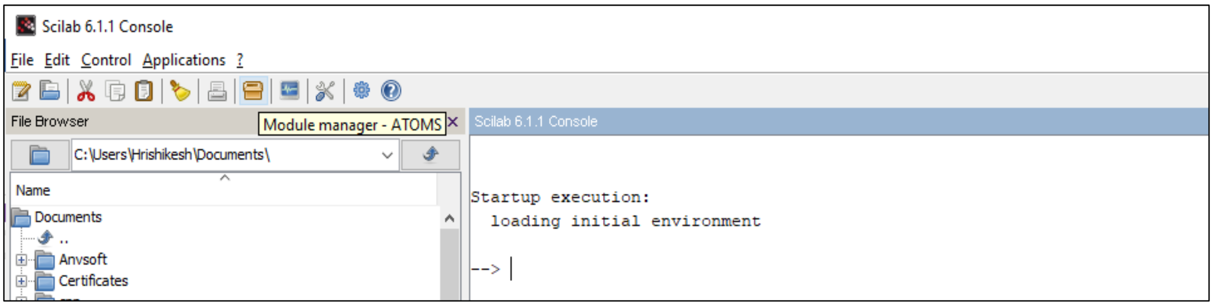
Name	Date modified	Type	Size
demos	15-11-2019 14:17	File folder	
etc	15-11-2019 14:18	File folder	
help	15-11-2019 14:17	File folder	
images	15-11-2019 14:18	File folder	
jar	15-11-2019 14:17	File folder	
macros	15-11-2019 14:21	File folder	
sci_gateway	15-11-2019 14:21	File folder	
tcl	15-11-2019 14:17	File folder	
tests	15-11-2019 14:18	File folder	
thirdparty	15-11-2019 14:17	File folder	
builder.sce	15-07-2019 09:06	scilab-6.1.1 (64-bit...	2 KB
ChangeLog.txt	15-11-2019 14:16	Text Document	3 KB
cleaner.sce	14-11-2019 23:24	scilab-6.1.1 (64-bit...	2 KB
DESCRIPTION	15-11-2019 14:14	File	1 KB
LICENSE	15-10-2019 08:51	File	35 KB
license.txt	16-03-2017 01:07	Text Document	1 KB
loader.sce	14-11-2019 23:24	scilab-6.1.1 (64-bit...	1 KB
README.txt	16-07-2019 14:39	Text Document	1 KB
unloader.sce	14-11-2019 23:24	scilab-6.1.1 (64-bit...	1 KB

Paste IPCV folder in C:\Program Files\scilab-6.0.2



Name	Date modified	Type	Size
bin	09-02-2022 21:30	File folder	
contrib	09-02-2022 21:29	File folder	
etc	09-02-2022 21:29	File folder	
IPCV	09-02-2022 21:55	File folder	
java	09-02-2022 21:29	File folder	
libs	09-02-2022 21:29	File folder	
locale	09-02-2022 21:29	File folder	
modules	09-02-2022 21:30	File folder	
thirdparty	09-02-2022 21:30	File folder	
tools	09-02-2022 21:29	File folder	
ACKNOWLEDGEMENTS	20-02-2018 04:02	File	8 KB
CHANGES.md	15-07-2021 13:55	MD File	71 KB
COPYING	13-02-2020 22:49	File	42 KB
COPYING-BSD	21-10-2017 17:36	File	2 KB
scilabwebsite	09-02-2022 21:30	Internet Shortcut	1 KB
unins000.dat	09-02-2022 21:30	DAT File	4,302 KB
unins000.exe	09-02-2022 21:27	Application	1,228 KB
Version.incl	15-07-2021 15:11	INCL File	1 KB

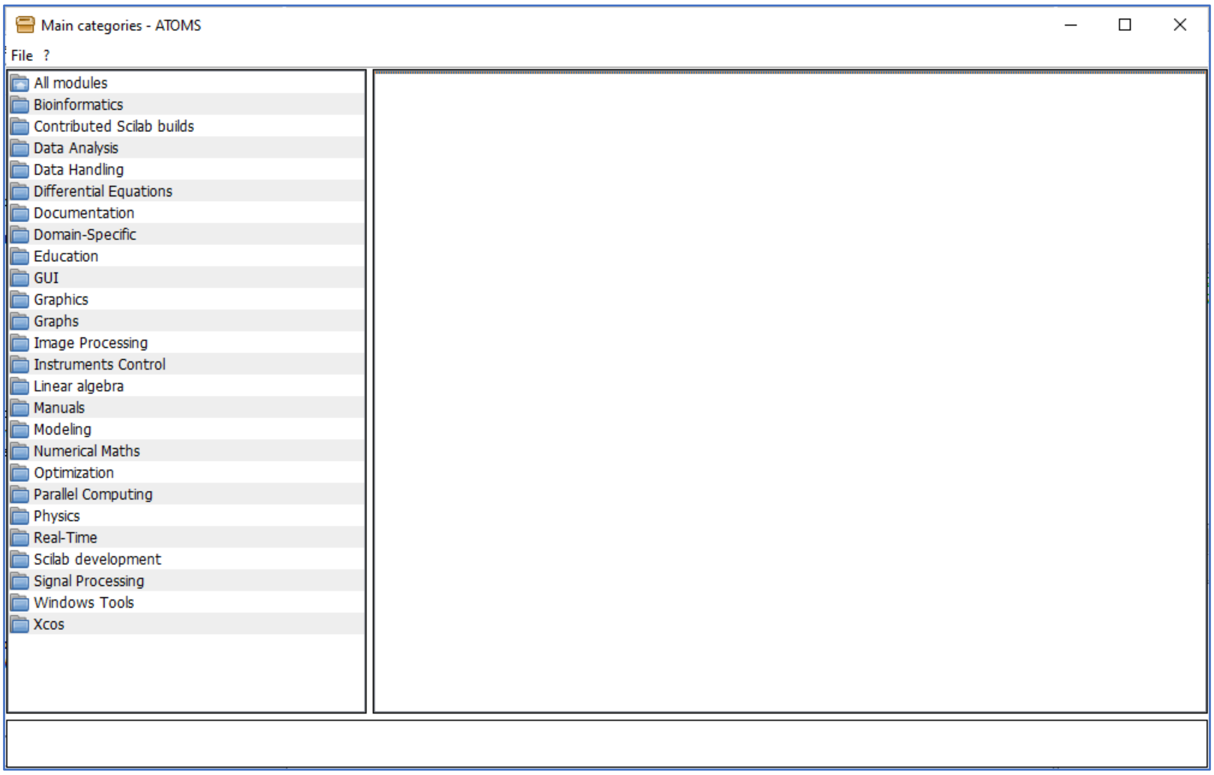
Open scilab 6.1.1. Click on Module Manager-ATOMS.



```
Startup execution:
  loading initial environment

-->
```

Click on Image Processing



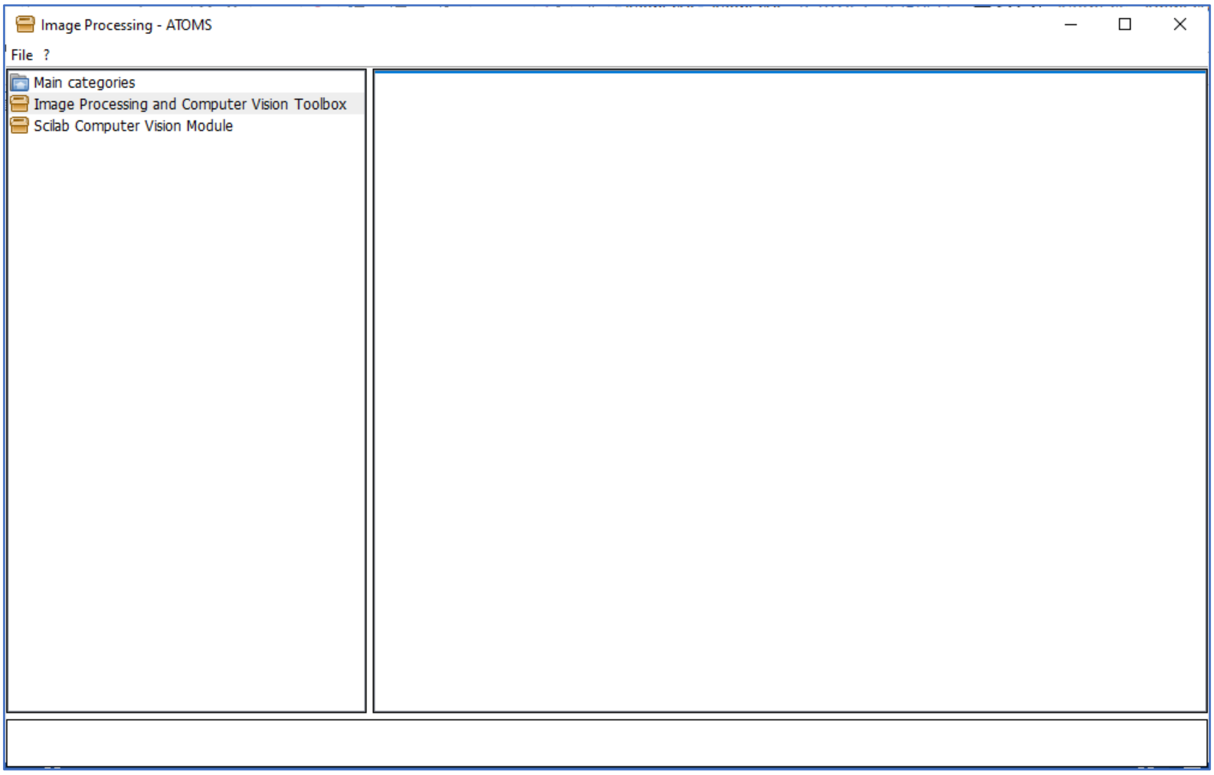


Image Processing - ATOMS
File ?
Main categories
Image Processing and Computer Vision Toolbox
Scilab Computer Vision Module

Install Image Processing and Computer Vision Toolbox.

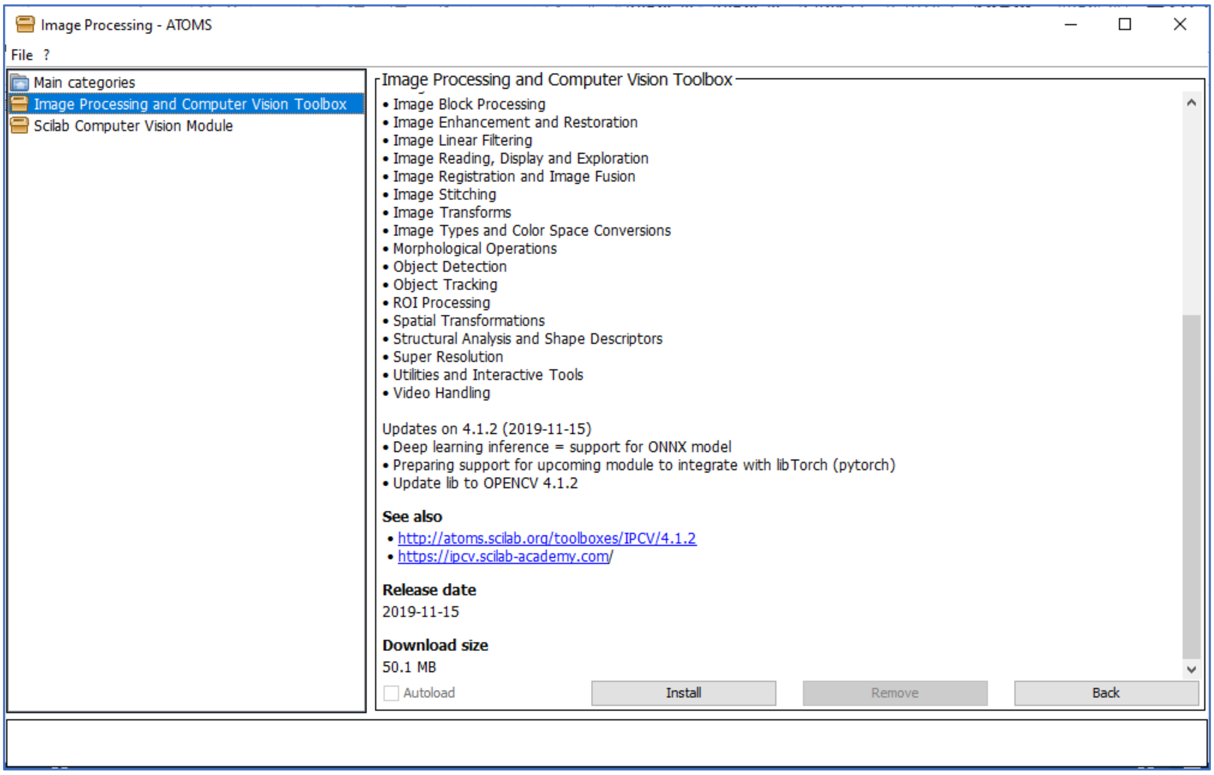


Image Processing - ATOMS
File ?
Main categories
Image Processing and Computer Vision Toolbox
Scilab Computer Vision Module

Image Processing and Computer Vision Toolbox

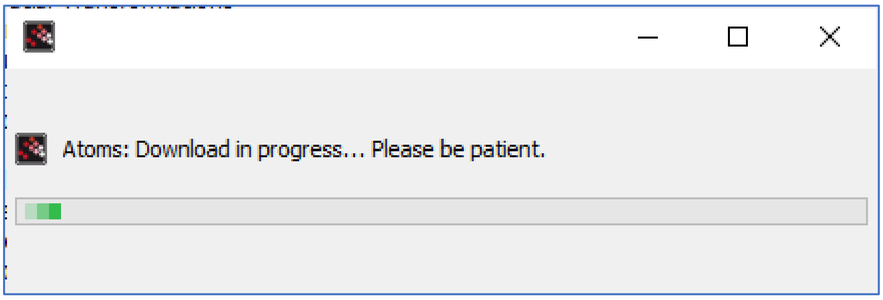
- Image Block Processing
- Image Enhancement and Restoration
- Image Linear Filtering
- Image Reading, Display and Exploration
- Image Registration and Image Fusion
- Image Stitching
- Image Transforms
- Image Types and Color Space Conversions
- Morphological Operations
- Object Detection
- Object Tracking
- ROI Processing
- Spatial Transformations
- Structural Analysis and Shape Descriptors
- Super Resolution
- Utilities and Interactive Tools
- Video Handling

Updates on 4.1.2 (2019-11-15)
- Deep learning inference = support for ONNX model
- Preparing support for upcoming module to integrate with libTorch (pytorch)
- Update lib to OPENCV 4.1.2

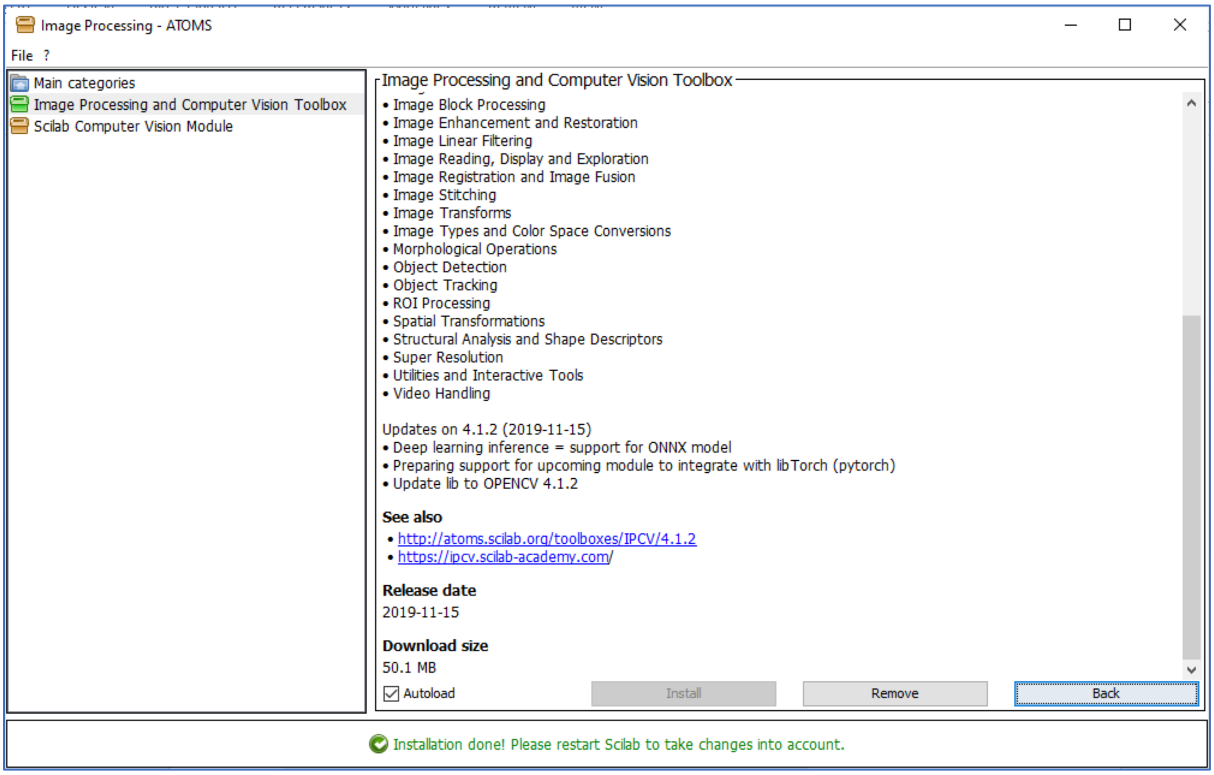
See also
- http://atoms.scilab.org/toolboxes/IPCV/4.1.2
- https://ipcv.scilab-academy.com/

Release date
2019-11-15

Download size
50.1 MB



Atoms: Download in progress… Please be patient.



- Main categories
- Image Processing and Computer Vision Toolbox
- Scilab Computer Vision Module

Image Processing and Computer Vision Toolbox

- Image Block Processing
- Image Enhancement and Restoration
- Image Linear Filtering
- Image Reading, Display and Exploration
- Image Registration and Image Fusion
- Image Stitching
- Image Transforms
- Image Types and Color Space Conversions
- Morphological Operations
- Object Detection
- Object Tracking
- ROI Processing
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- Update lib to OPENCV 4.1.2

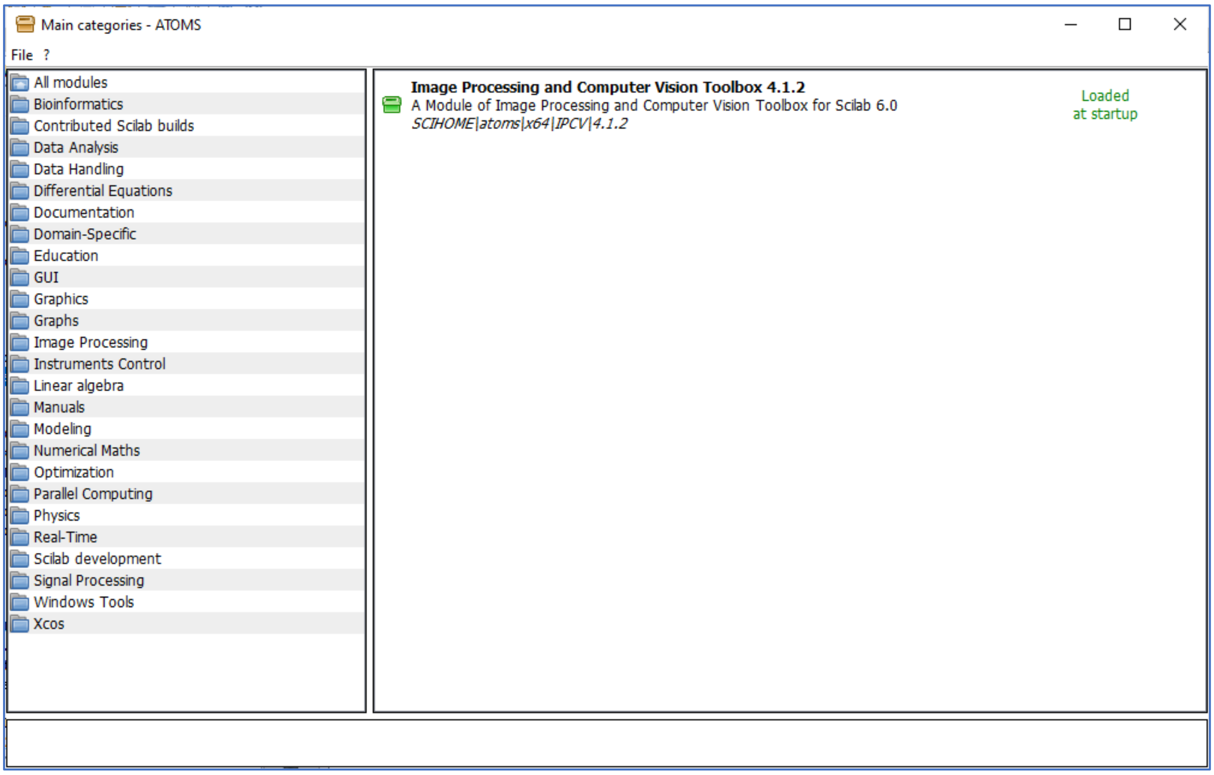
See also
- http://atoms.scilab.org/toolboxes/IPCV/4.1.2
- https://ipcv.scilab-academy.com/

Release date
2019-11-15

Download size
50.1 MB

☑ Autoload

Installation done! Please restart Scilab to take changes into account.



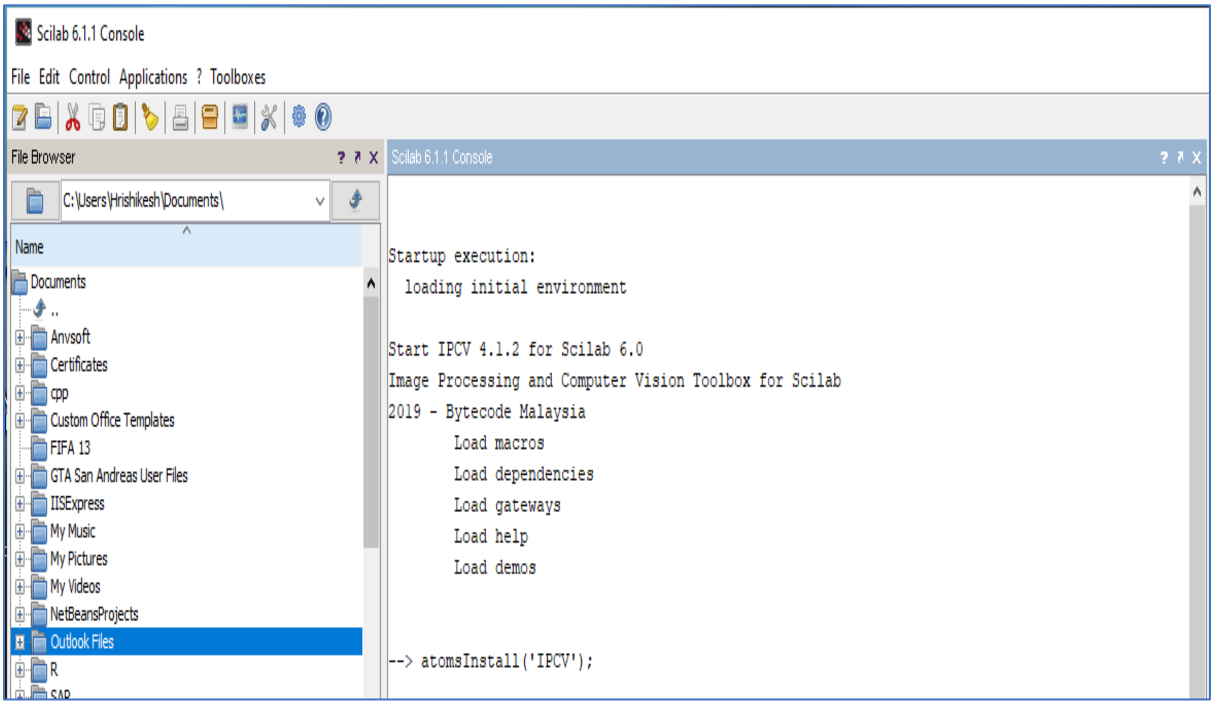
- All modules
- Bioinformatics
- Contributed Scilab builds
- Data Analysis
- Data Handling
- Differential Equations
- Documentation
- Domain-Specific
- Education
- GUI
- Graphics
- Graphs
- Image Processing
- Instruments Control
- Linear algebra
- Manuals
- Modeling
- Numerical Maths
- Optimization
- Parallel Computing
- Physics
- Real-Time
- Scilab development
- Signal Processing
- Windows Tools
- Xcos

Image Processing and Computer Vision Toolbox 4.1.2
A Module of Image Processing and Computer Vision Toolbox for Scilab 6.0
SCIHOME\atoms\x64\IPCV\4.1.2

Loaded
at startup

Open scilab 6.1.1 console

Type **atomsInstall("IPCV")**

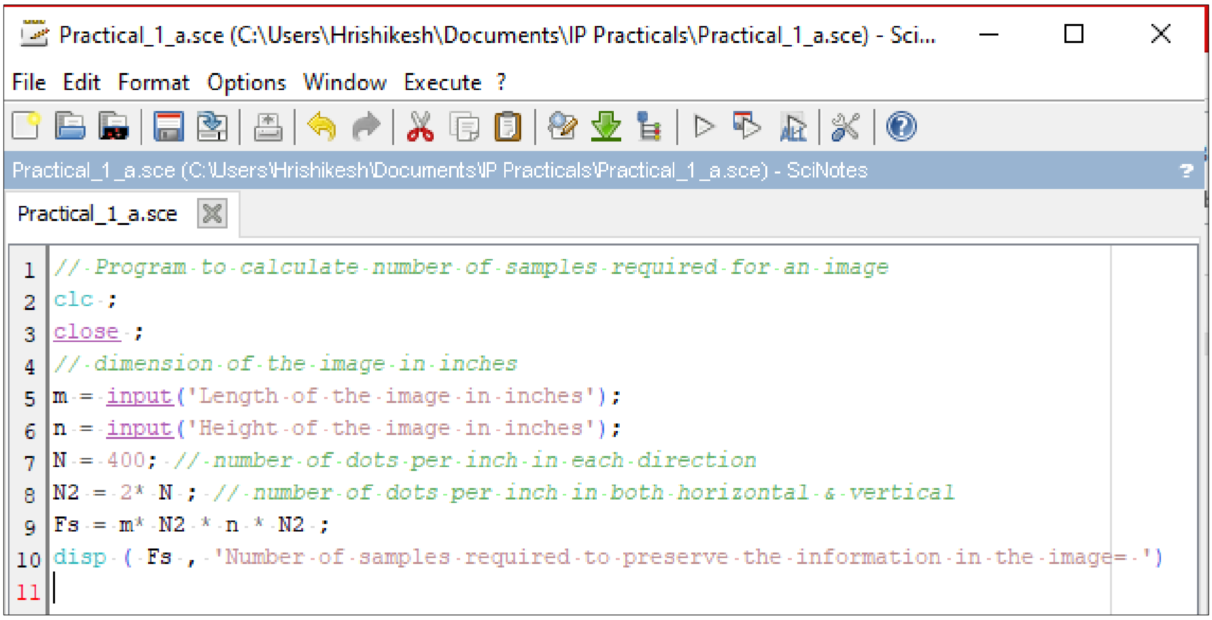


```
Startup execution:
  loading initial environment

Start IPCV 4.1.2 for Scilab 6.0
Image Processing and Computer Vision Toolbox for Scilab
2019 - Bytecode Malaysia
        Load macros
        Load dependencies
        Load gateways
        Load help
        Load demos


--> atomsInstall('IPCV');
```

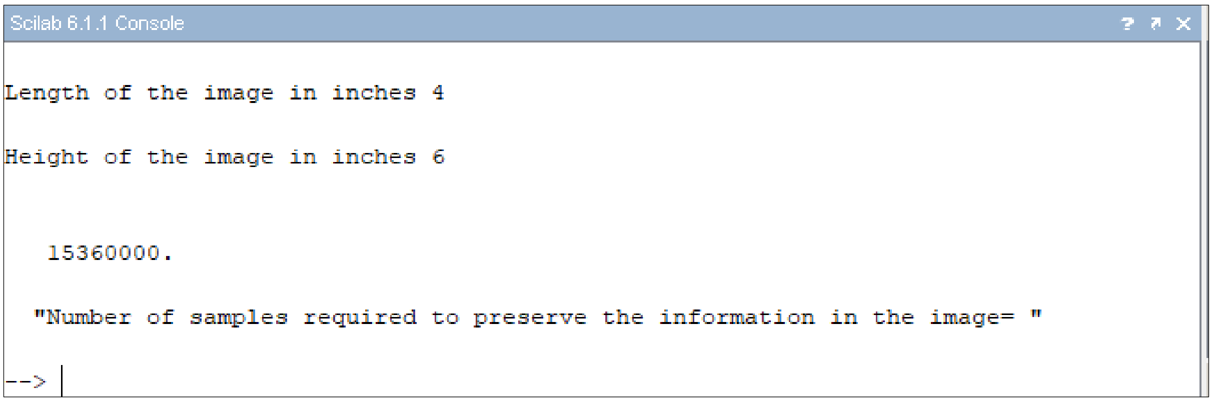
Practical No 1

Aim: Basics

a Program to calculate number of samples required for an image.

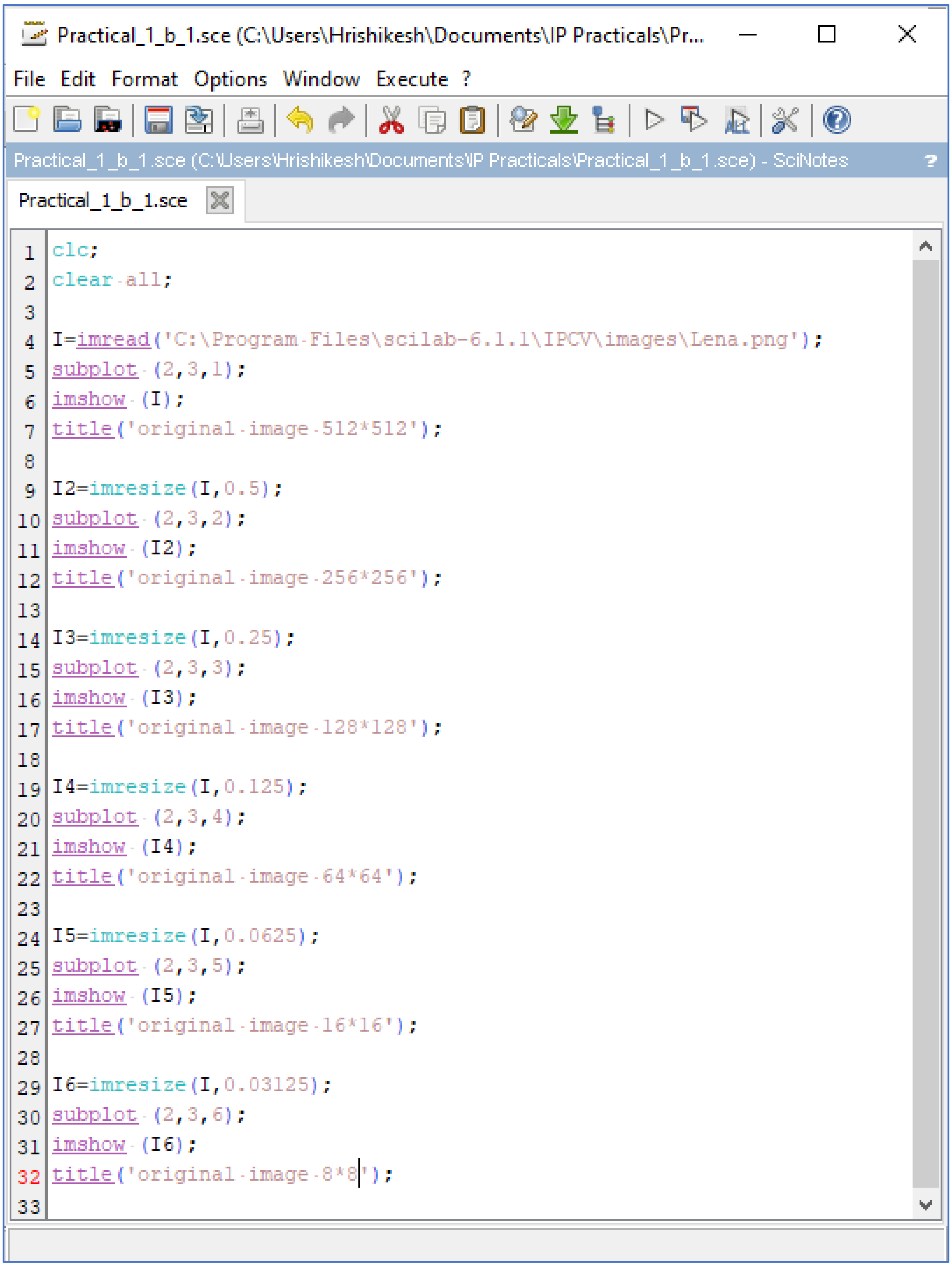

Practical_1_a.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_a.sce) - Sci...
File Edit Format Options Window Execute ?
Practical_1_a.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_a.sce) - SciNotes
Practical_1_a.sce

```
// Program to calculate number of samples required for an image
clc ;
close ;
// dimension of the image in inches
m = input('Length of the image in inches');
n = input('Height of the image in inches');
N = 400; // number of dots per inch in each direction
N2 = 2* N ; // number of dots per inch in both horizontal & vertical
Fs = m* N2 * n * N2 ;
disp ( Fs , 'Number of samples required to preserve the information in the image= ')
```

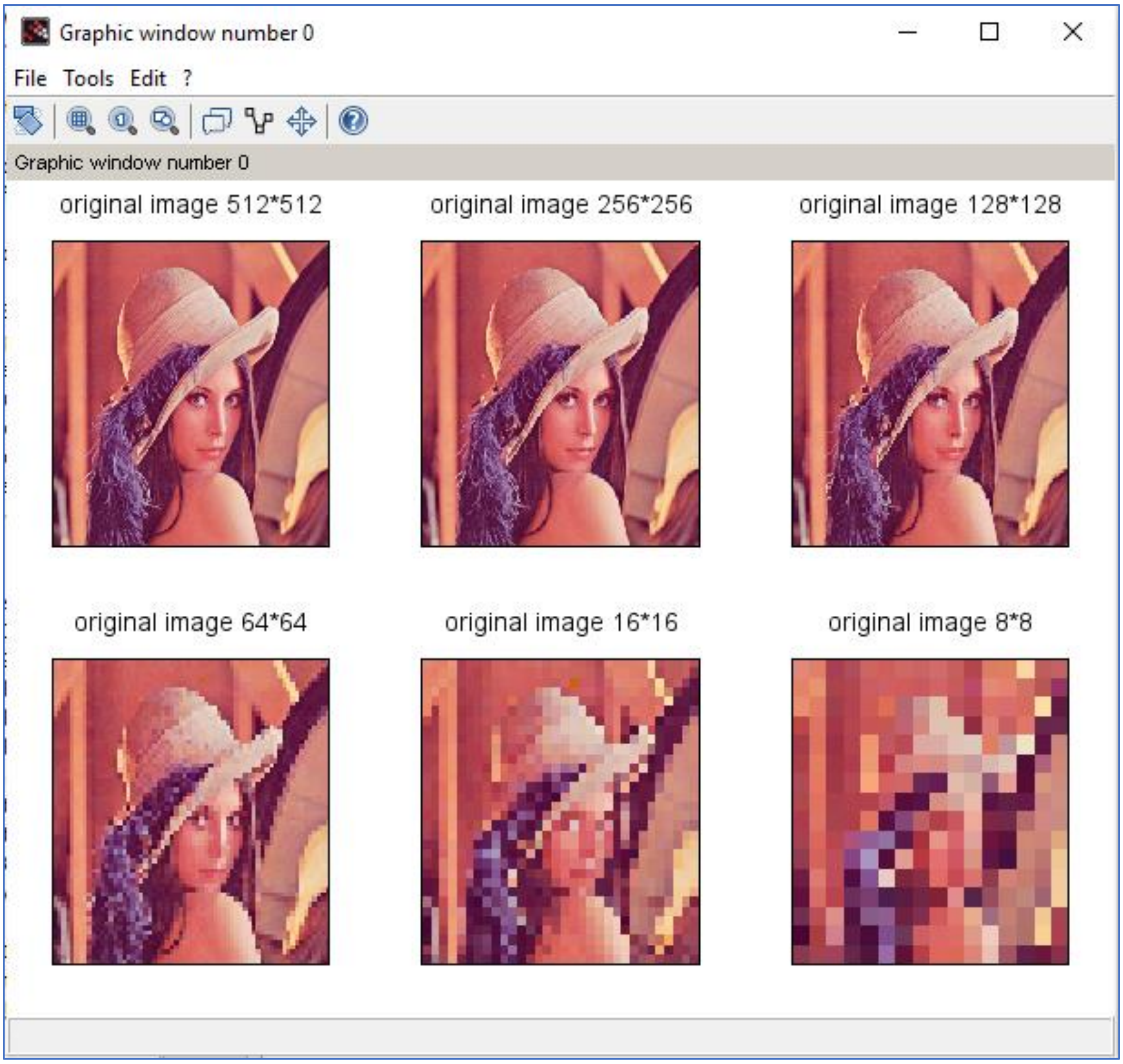


```
Length of the image in inches 4

Height of the image in inches 6


   15360000.

  "Number of samples required to preserve the information in the image= "

-->
```

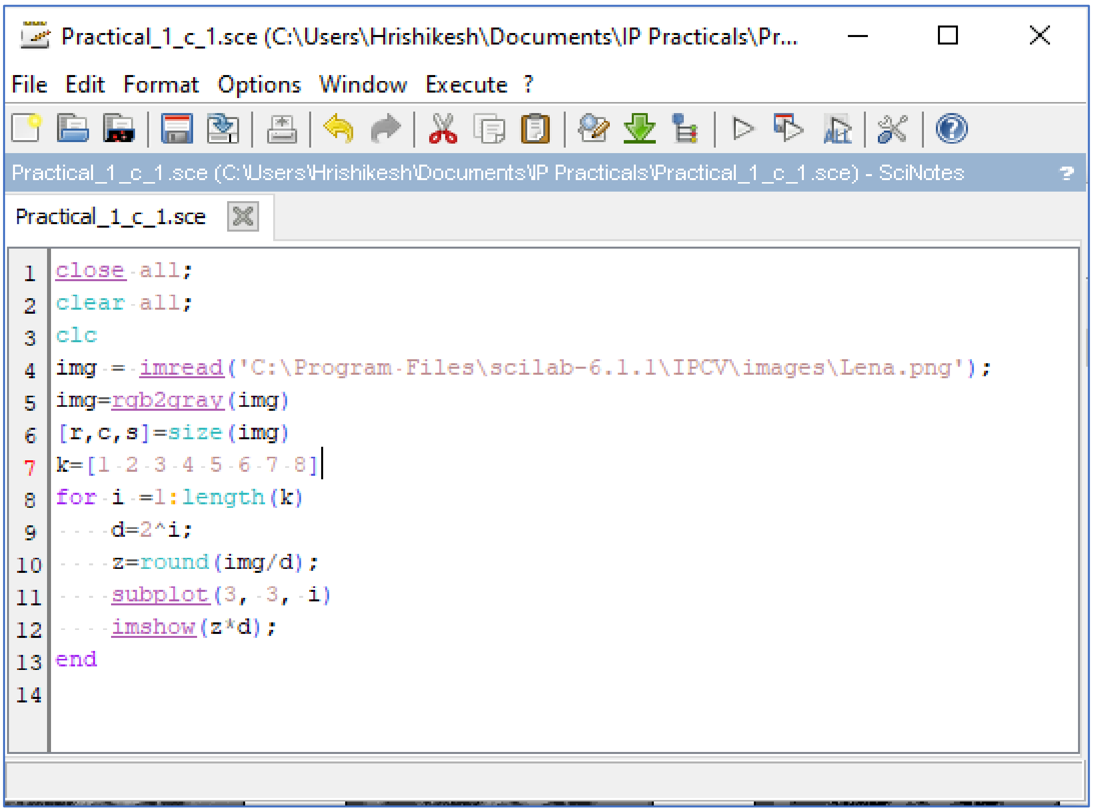
b Program to study the effects of reducing the spatial resolution of a digital image.


Practical_1_b_1.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Pr...
File Edit Format Options Window Execute ?
Practical_1_b_1.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_b_1.sce) - SciNotes
Practical_1_b_1.sce

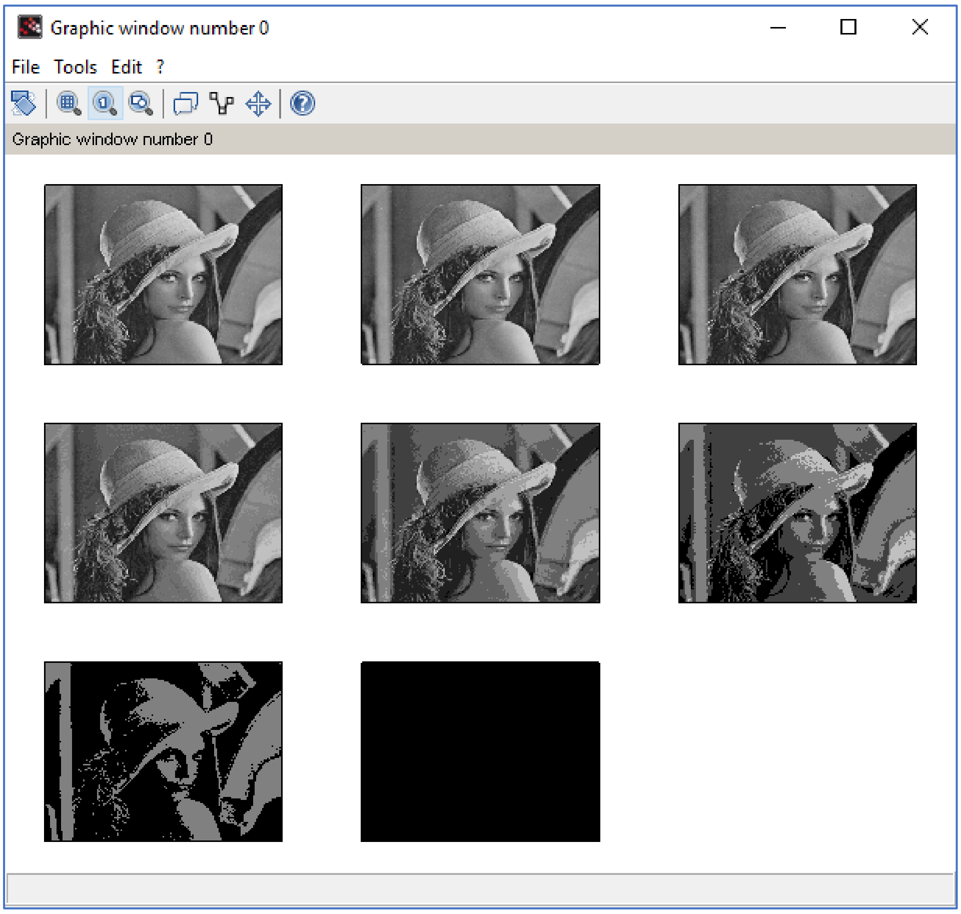
```
clc;
clear all;

I=imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena.png');
subplot (2,3,1);
imshow (I);
title('original image 512*512');

I2=imresize(I,0.5);
subplot (2,3,2);
imshow (I2);
title('original image 256*256');

I3=imresize(I,0.25);
subplot (2,3,3);
imshow (I3);
title('original image 128*128');

I4=imresize(I,0.125);
subplot (2,3,4);
imshow (I4);
title('original image 64*64');

I5=imresize(I,0.0625);
subplot (2,3,5);
imshow (I5);
title('original image 16*16');

I6=imresize(I,0.03125);
subplot (2,3,6);
imshow (I6);
title('original image 8*8');

```


Graphic window number 0
File Tools Edit ?
Graphic window number 0
original image 512*512
original image 256*256
original image 128*128
original image 64*64
original image 16*16
original image 8*8

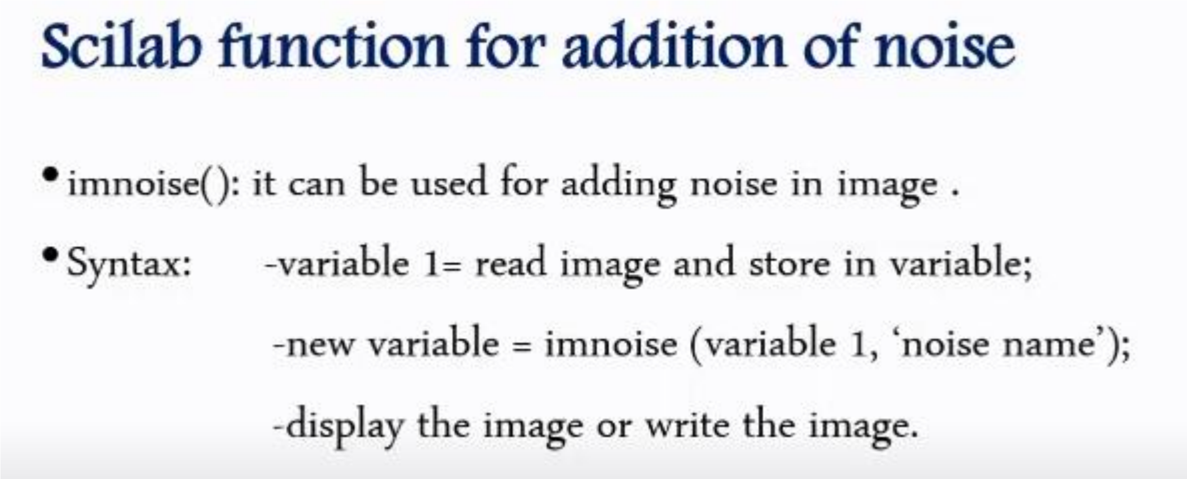
c Program to study the effects of varying the number of intensity levels in a digital image


Practical_1_c_1.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Pr...
File Edit Format Options Window Execute ?
Practical_1_c_1.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_c_1.sce) - SciNotes
Practical_1_c_1.sce

```
close all;
clear all;
clc
img = imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena.png');
img=rgb2gray(img)
[r,c,s]=size(img)
k=[1 2 3 4 5 6 7 8]
for i =1:length(k)
    d=2^i;
    z=round(img/d);
    subplot(3, 3, i)
    imshow(z*d);
end
```



d Program to perform image averaging (image addition) for noise reduction.

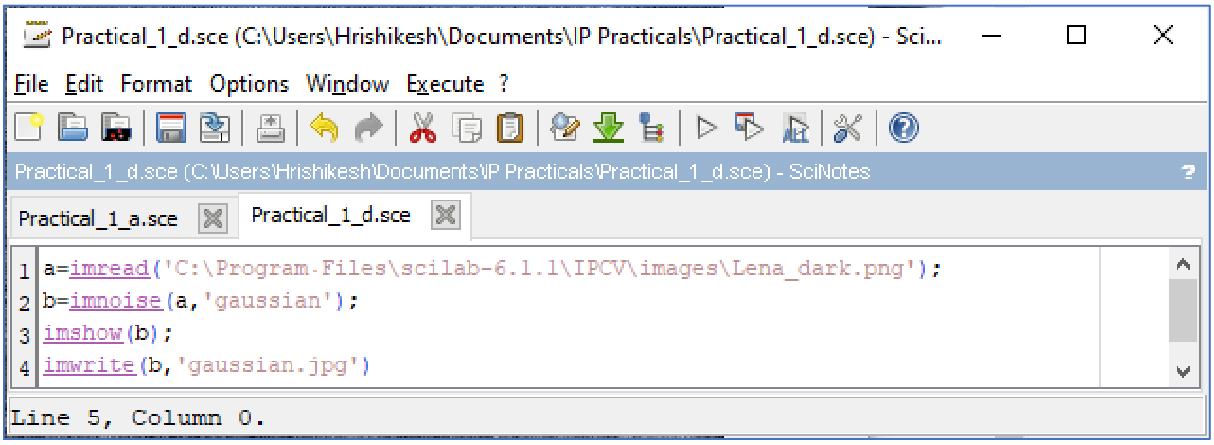


Scilab function for addition of noise

- imnoise(): it can be used for adding noise in image .
- Syntax: -variable 1= read image and store in variable;

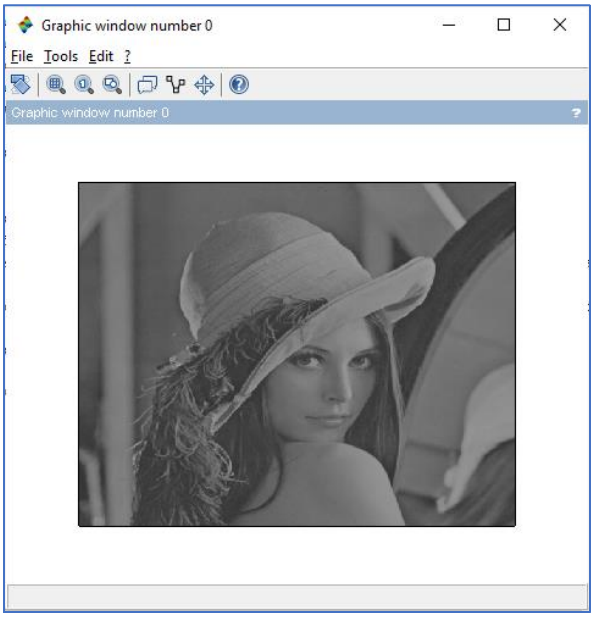
  -new variable = imnoise (variable 1, 'noise name');

  -display the image or write the image.

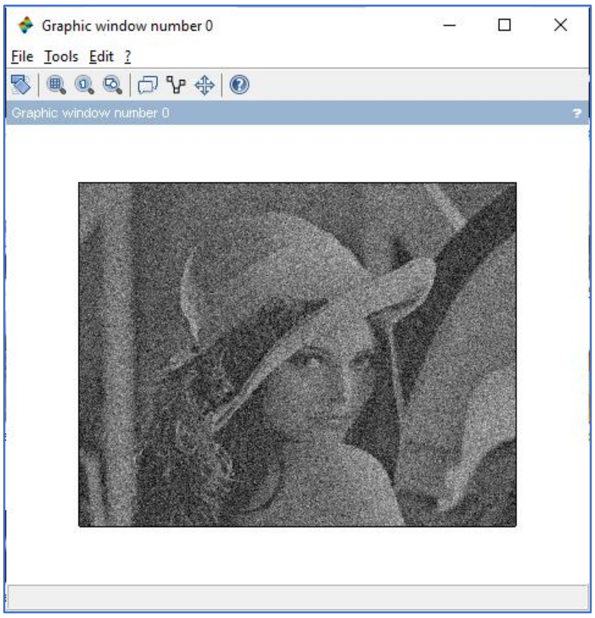

Practical_1_d.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_d.sce) - Sci...
File Edit Format Options Window Execute ?
Practical_1_d.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_d.sce) - SciNotes
Practical_1_a.sce
Practical_1_d.sce

```
a=imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena_dark.png');
b=imnoise(a,'gaussian');
imshow(b);
imwrite(b,'gaussian.jpg')
```

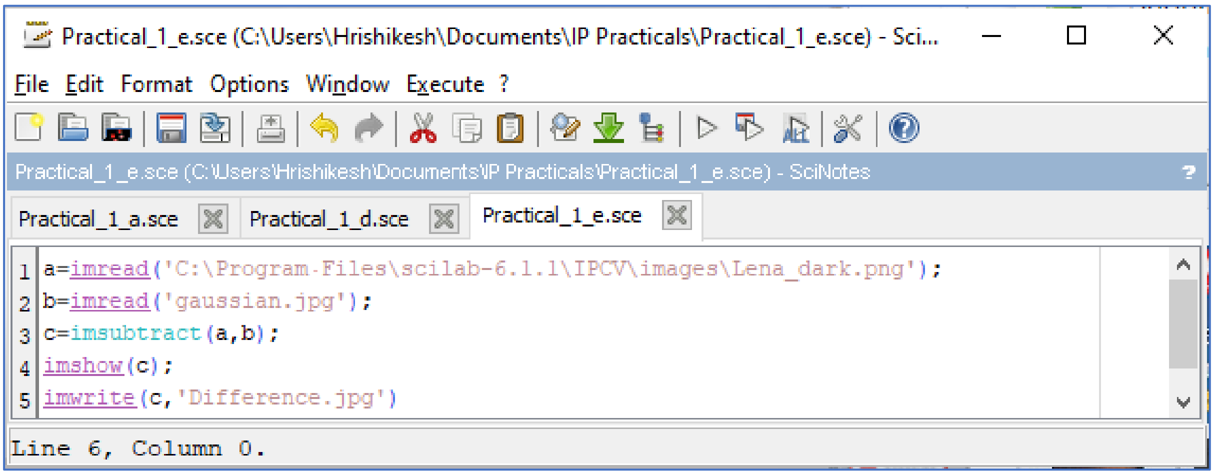
Original Image



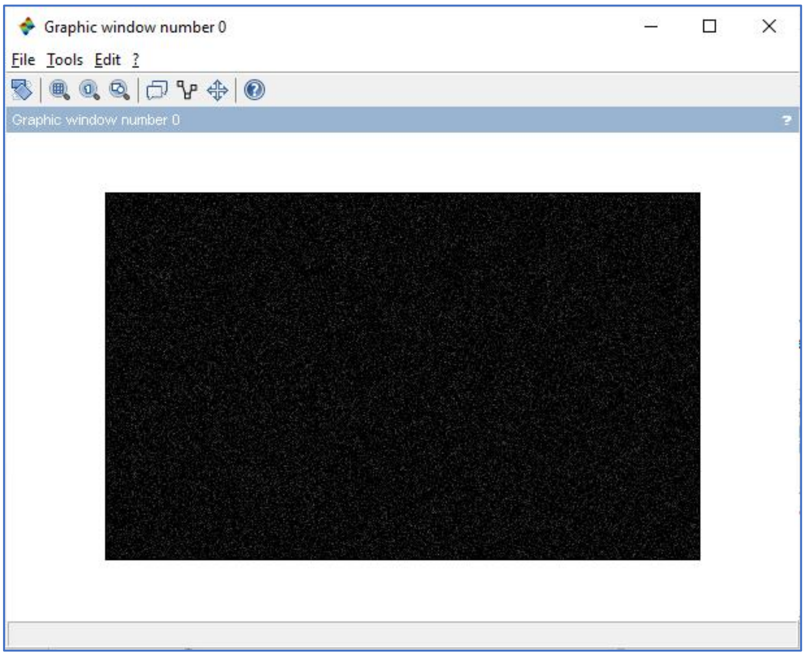
Output Image



e. **Program to compare images using subtraction for enhancing the difference between images.**


Practical_1_e.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_e.sce) - Sci...
File Edit Format Options Window Execute ?
Practical_1_e.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_1_e.sce) - SciNotes
Practical_1_a.sce
Practical_1_d.sce
Practical_1_e.sce
Line 6, Column 0.

```
a=imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena_dark.png');
b=imread('gaussian.jpg');
c=imsubtract(a,b);
imshow(c);
imwrite(c,'Difference.jpg')
```

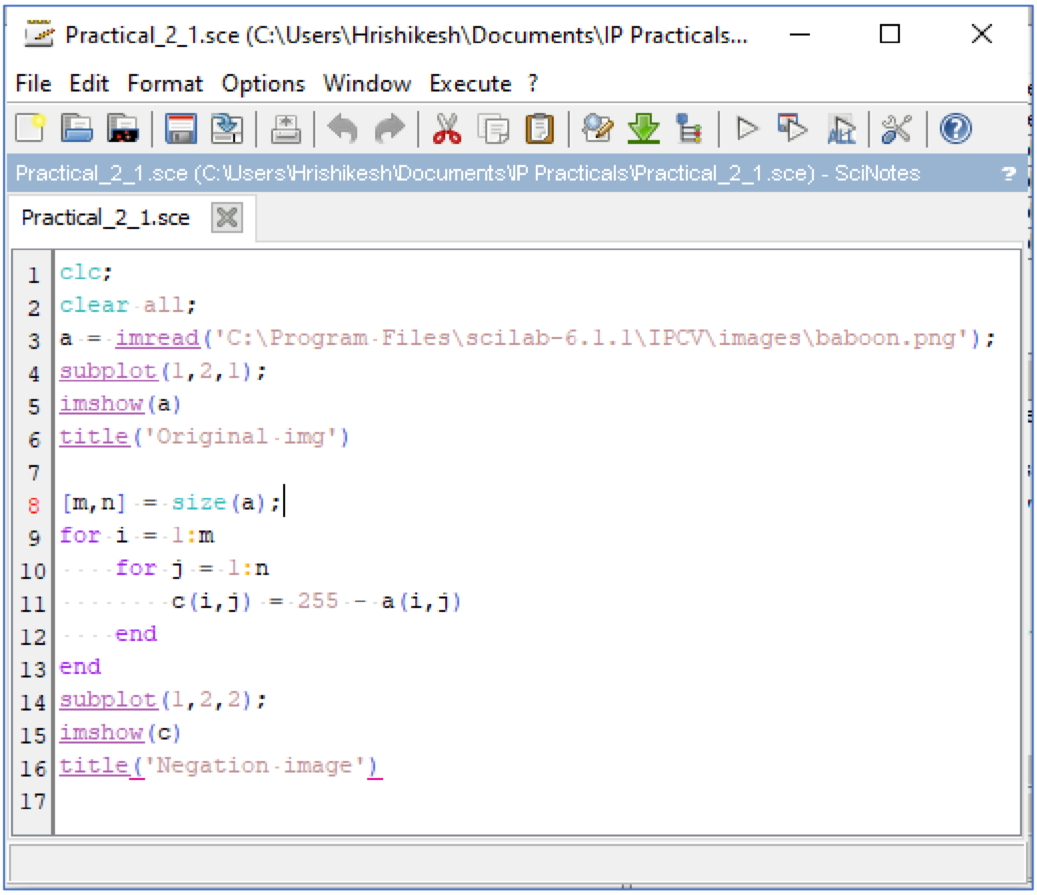


Practical No 2

Aim: IMAGE ENHANCEMENT

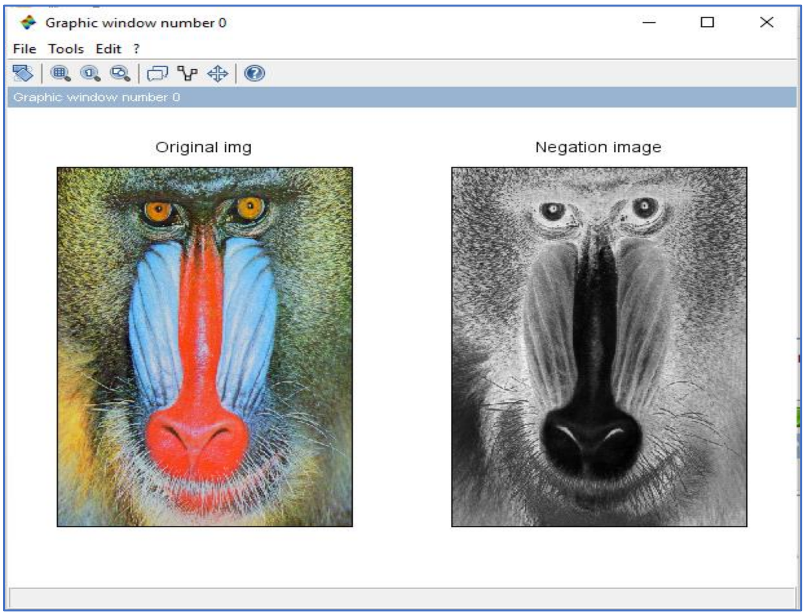
A Basic Intensity Transformation functions

i. Program to perform Image negation

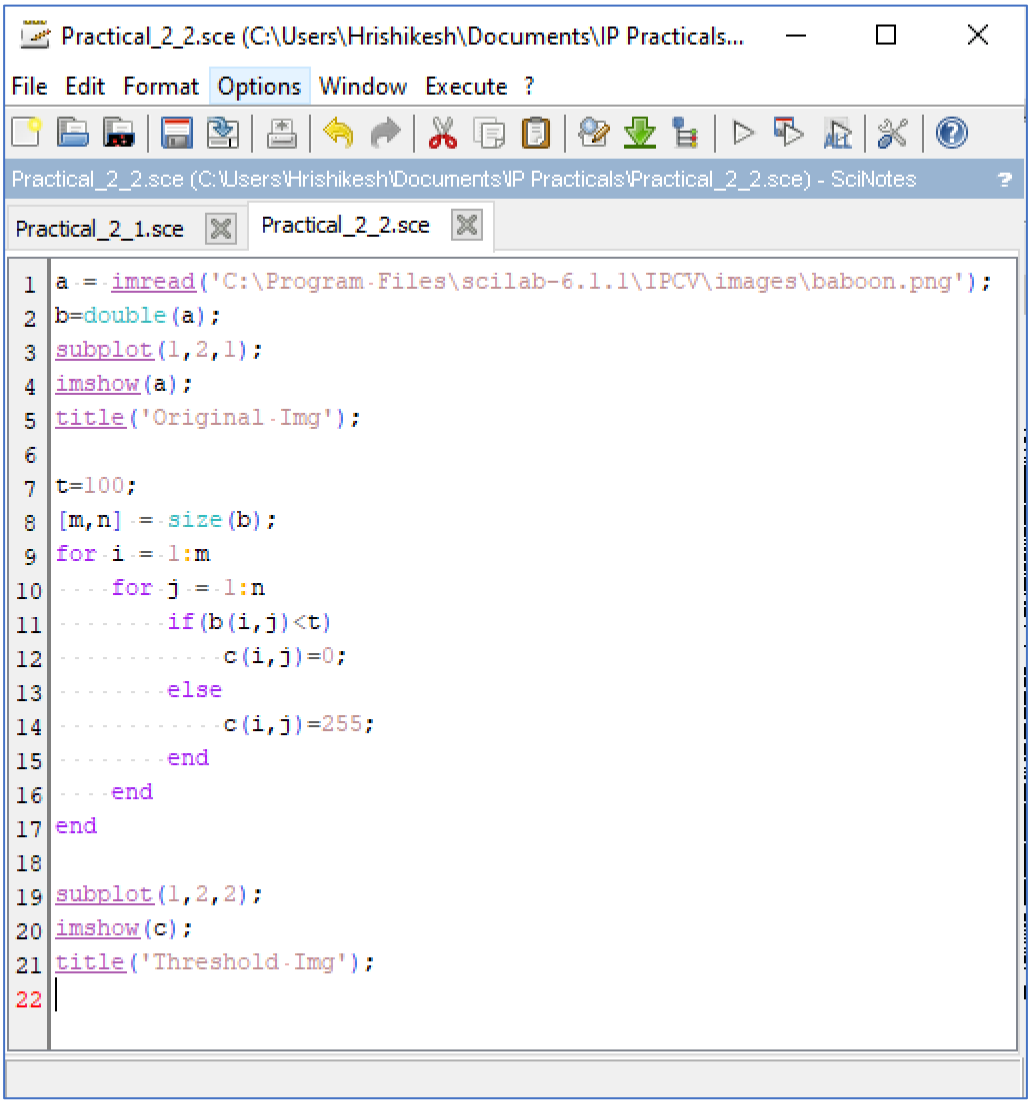

Practical_2_1.sce (C:\Users\Hrishikesh\Documents\IP Practicals...
File Edit Format Options Window Execute ?
Practical_2_1.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_1.sce) - SciNotes
Practical_2_1.sce

```
clc;
clear all;
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\baboon.png');
subplot(1,2,1);
imshow(a)
title('Original img')

[m,n] = size(a);
for i = 1:m
    for j = 1:n
        c(i,j) = 255 - a(i,j)
    end
end
subplot(1,2,2);
imshow(c)
title('Negation image')
```

Output:

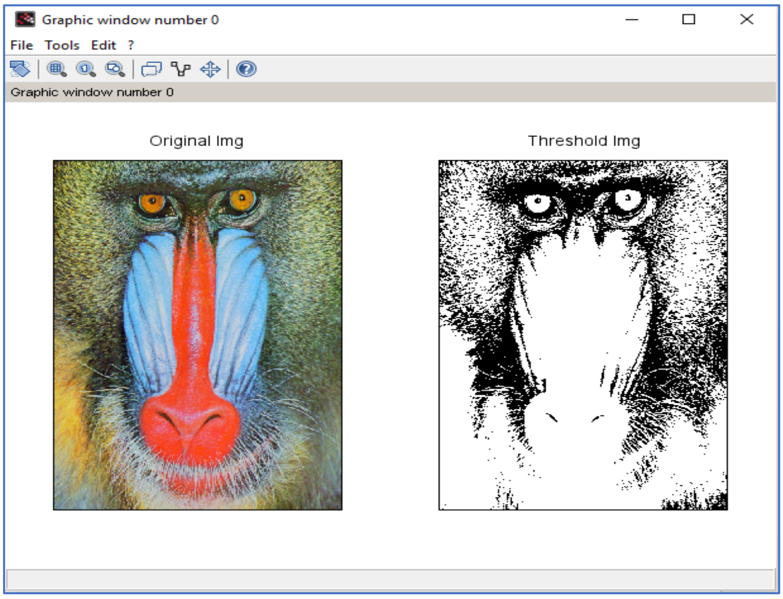


ii. Program to perform threshold on an image.

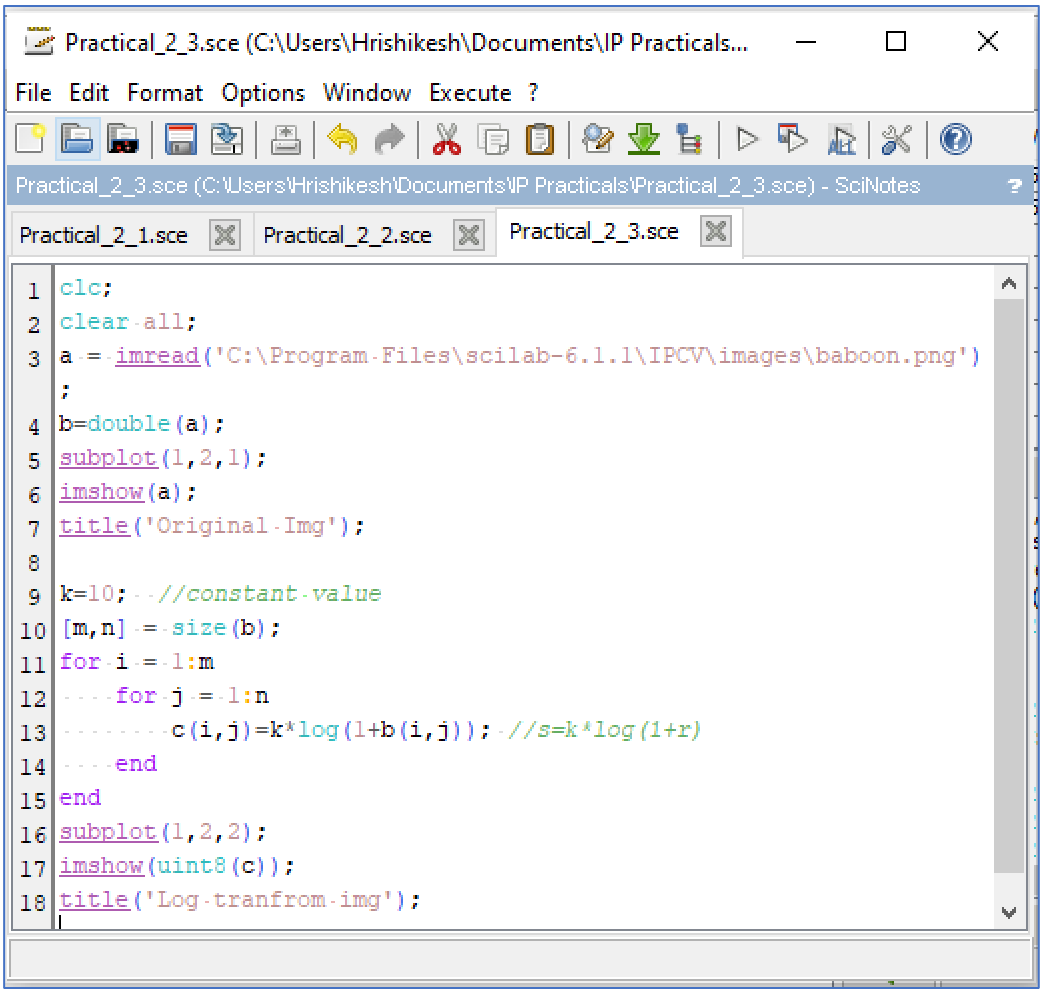

Practical_2_2.sce (C:\Users\Hrishikesh\Documents\IP Practicals...
File Edit Format Options Window Execute ?
Practical_2_2.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_2.sce) - SciNotes
Practical_2_1.sce
Practical_2_2.sce

```
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\baboon.png');
b=double(a);
subplot(1,2,1);
imshow(a);
title('Original Img');

t=100;
[m,n] = size(b);
for i = 1:m
    for j = 1:n
        if(b(i,j)<t)
            c(i,j)=0;
        else
            c(i,j)=255;
        end
    end
end

subplot(1,2,2);
imshow(c);
title('Threshold Img');
```

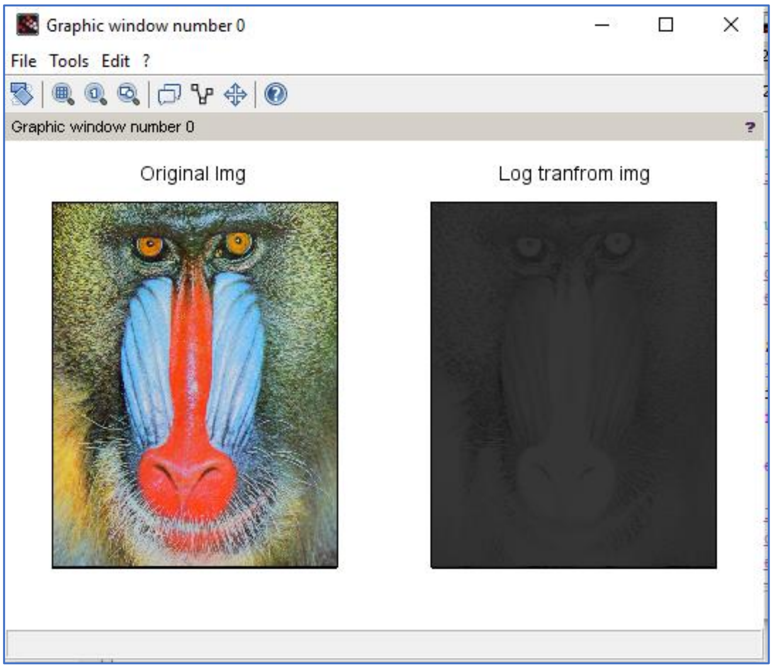
Output:



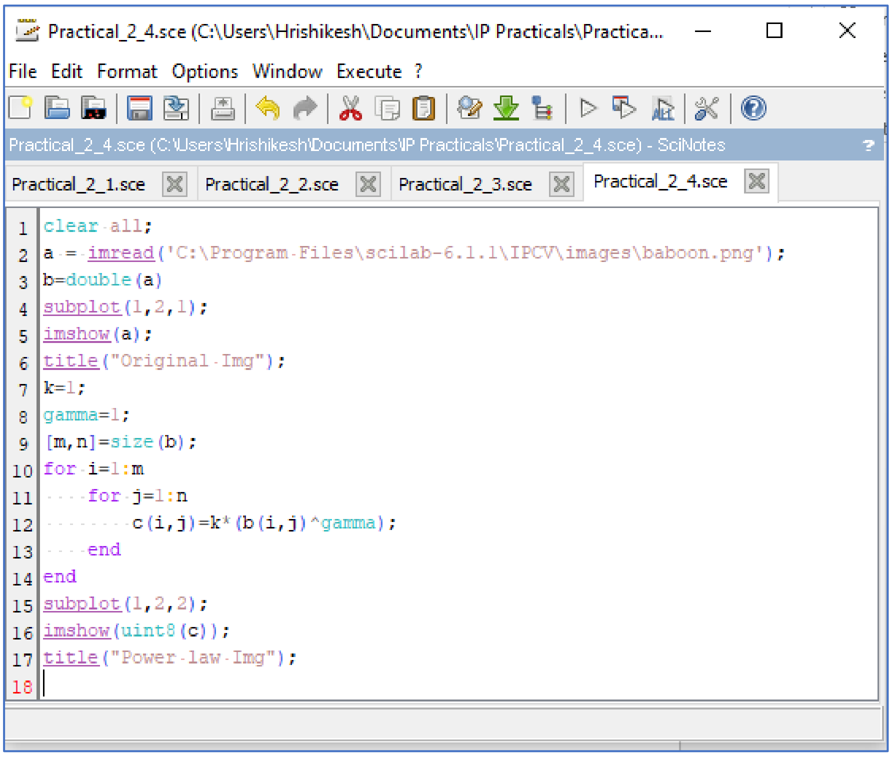
iii.Program to perform Log transformation


Practical_2_3.sce (C:\Users\Hrishikesh\Documents\IP Practicals...
File Edit Format Options Window Execute ?
Practical_2_3.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_3.sce) - SciNotes
Practical_2_1.sce
Practical_2_2.sce
Practical_2_3.sce

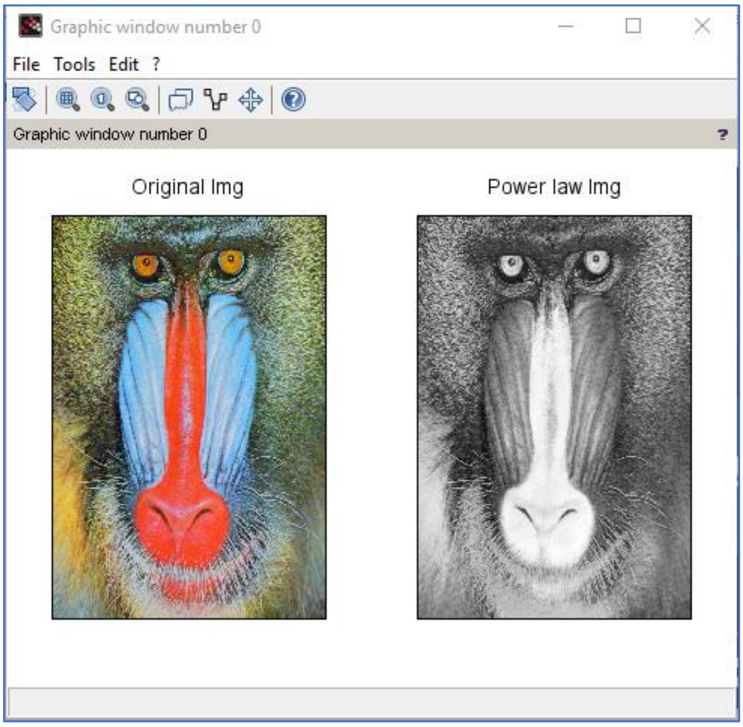
```
clc;
clear all;
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\baboon.png')
;
b=double(a);
subplot(1,2,1);
imshow(a);
title('Original Img');

k=10;  //constant value
[m,n] = size(b);
for i = 1:m
    for j = 1:n
        c(i,j)=k*log(1+b(i,j)); //s=k*log(1+r)
    end
end
subplot(1,2,2);
imshow(uint8(c));
title('Log tranfrom img');
```



iv. Power-law transformations

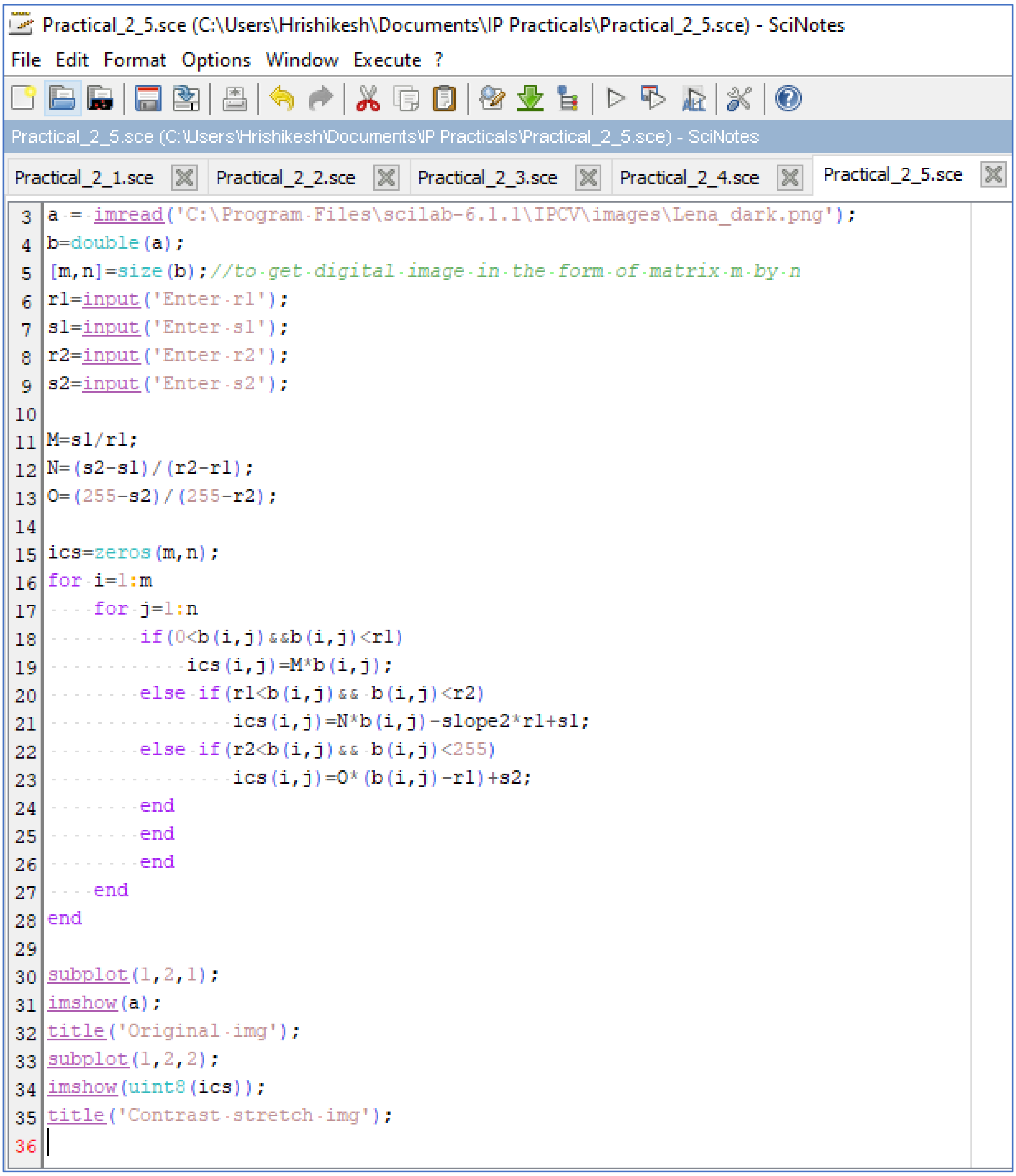

Practical_2_4.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practica...
File Edit Format Options Window Execute ?
Practical_2_4.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_4.sce) - SciNotes
Practical_2_1.sce
Practical_2_2.sce
Practical_2_3.sce
Practical_2_4.sce

```
clear all;
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\baboon.png');
b=double(a)
subplot(1,2,1);
imshow(a);
title("Original Img");
k=1;
gamma=1;
[m,n]=size(b);
for i=1:m
    for j=1:n
        c(i,j)=k*(b(i,j)^gamma);
    end
end
subplot(1,2,2);
imshow(uint8(c));
title("Power law Img");
```

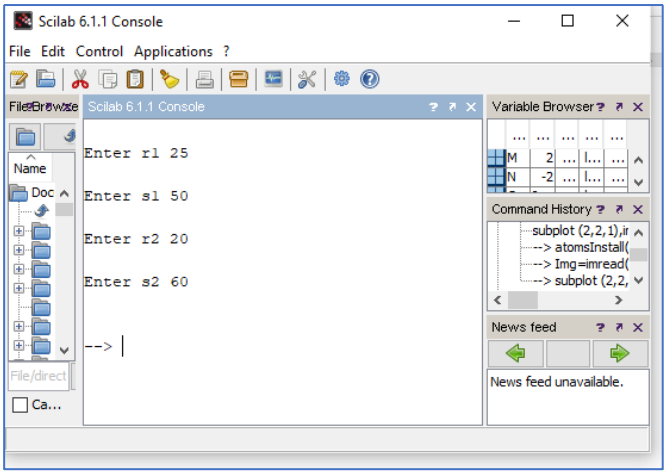


v. Piecewise linear transformations

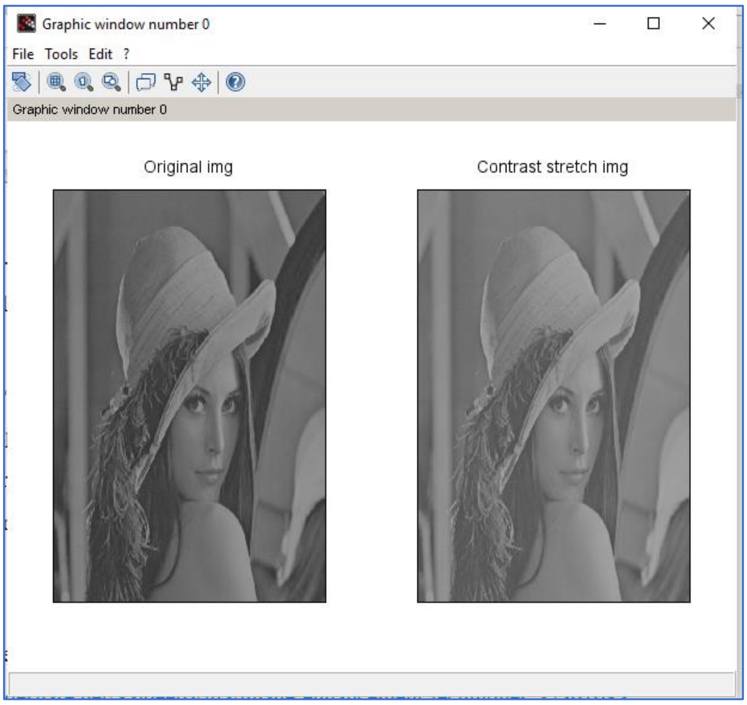
a. Contrast Stretching


Practical_2_5.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_5.sce) - SciNotes
File Edit Format Options Window Execute ?
Practical_2_5.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_5.sce) - SciNotes
Practical_2_1.sce
Practical_2_2.sce
Practical_2_3.sce
Practical_2_4.sce
Practical_2_5.sce

```
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena_dark.png');
b=double(a);
[m,n]=size(b);//to get digital image in the form of matrix m by n
r1=input('Enter r1');
s1=input('Enter s1');
r2=input('Enter r2');
s2=input('Enter s2');

M=s1/r1;
N=(s2-s1)/(r2-r1);
O=(255-s2)/(255-r2);

ics=zeros(m,n);
for i=1:m
    for j=1:n
        if(0<b(i,j)&&b(i,j)<r1)
            ics(i,j)=M*b(i,j);
        else if(r1<b(i,j)&& b(i,j)<r2)
                ics(i,j)=N*b(i,j)-slope2*r1+s1;
        else if(r2<b(i,j)&& b(i,j)<255)
                ics(i,j)=O*(b(i,j)-r1)+s2;
        end
        end
        end
    end
end

subplot(1,2,1);
imshow(a);
title('Original img');
subplot(1,2,2);
imshow(uint8(ics));
title('Contrast stretch img');
```

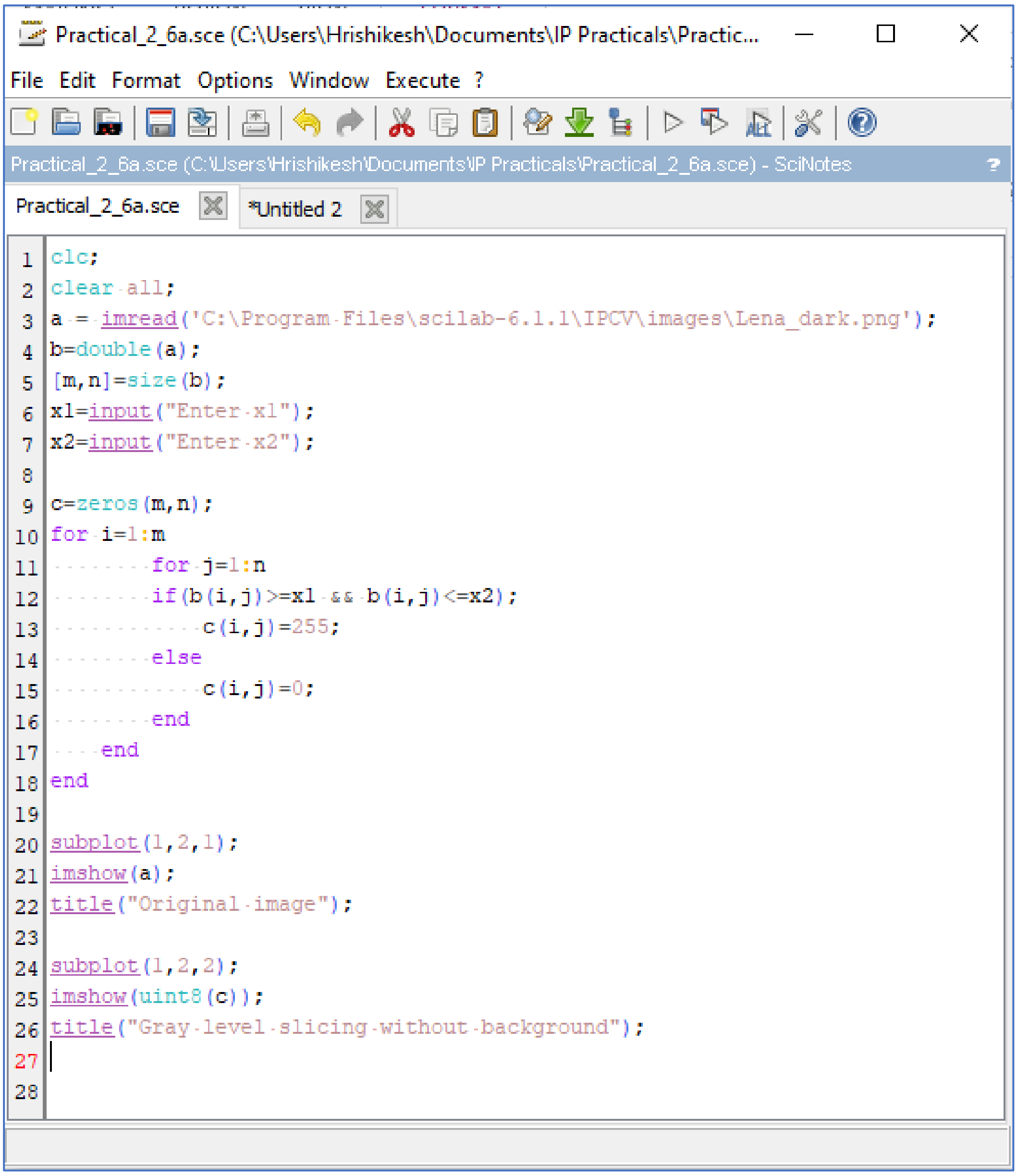


```
Enter r1 25

Enter s1 50

Enter r2 20

Enter s2 60


--> 
```

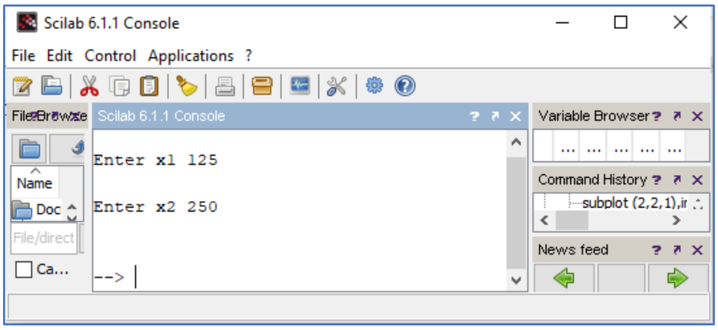


b. Gray-level slicing with and without background.

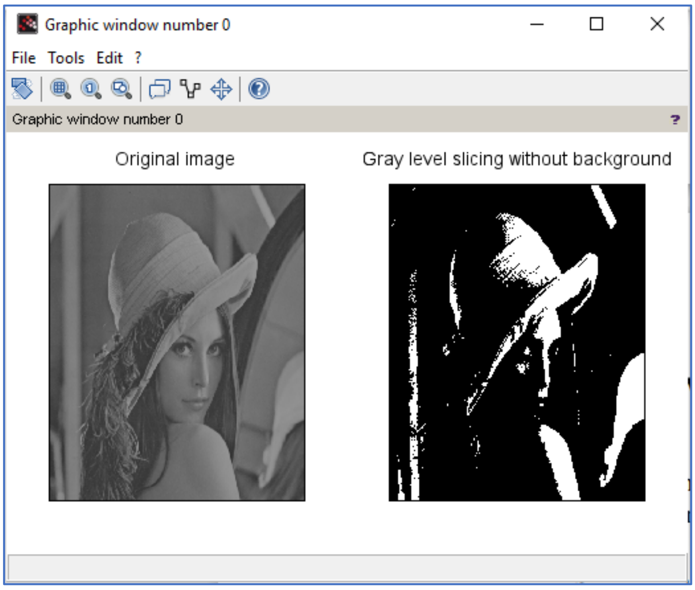
Gray-level slicing without background


Practical_2_6a.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practic...
File Edit Format Options Window Execute ?
Practical_2_6a.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_6a.sce) - SciNotes
Practical_2_6a.sce
*Untitled 2

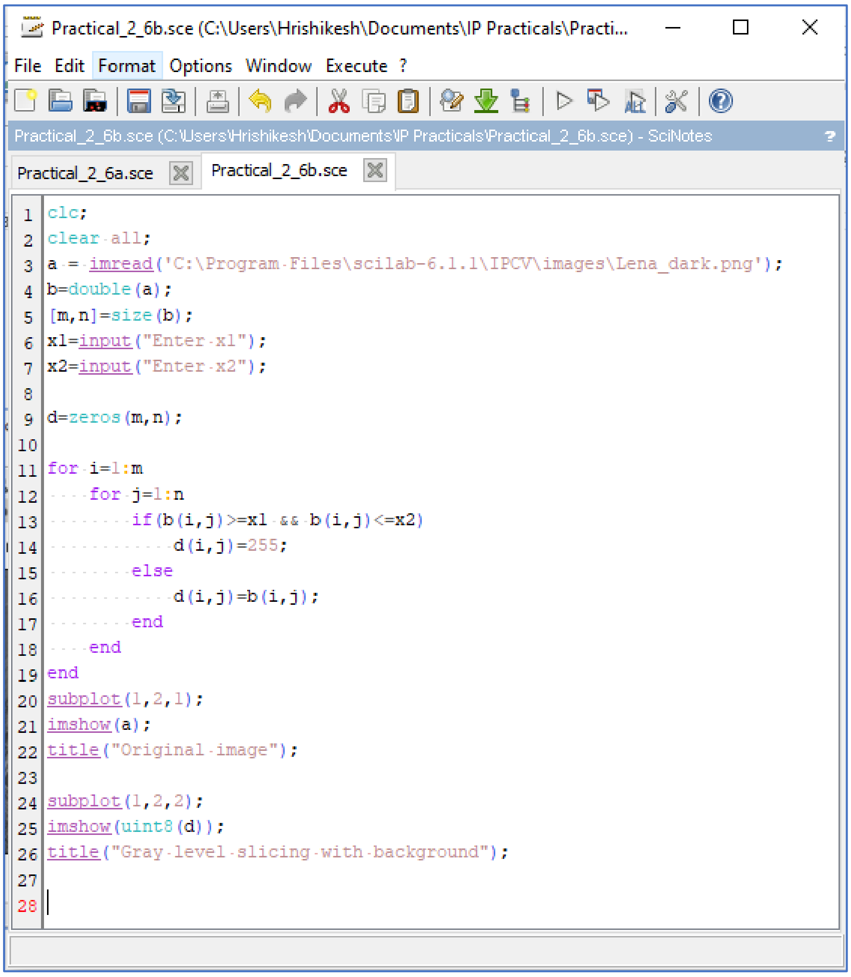
```
clc;
clear all;
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena_dark.png');
b=double(a);
[m,n]=size(b);
x1=input("Enter x1");
x2=input("Enter x2");

c=zeros(m,n);
for i=1:m
        for j=1:n
        if(b(i,j)>=x1 && b(i,j)<=x2);
            c(i,j)=255;
        else
            c(i,j)=0;
        end
    end
end

subplot(1,2,1);
imshow(a);
title("Original image");

subplot(1,2,2);
imshow(uint8(c));
title("Gray level slicing without background");
```



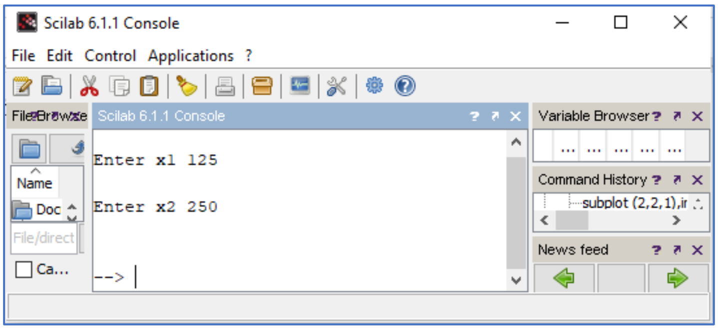
```
Enter x1 125

Enter x2 250

-->
```



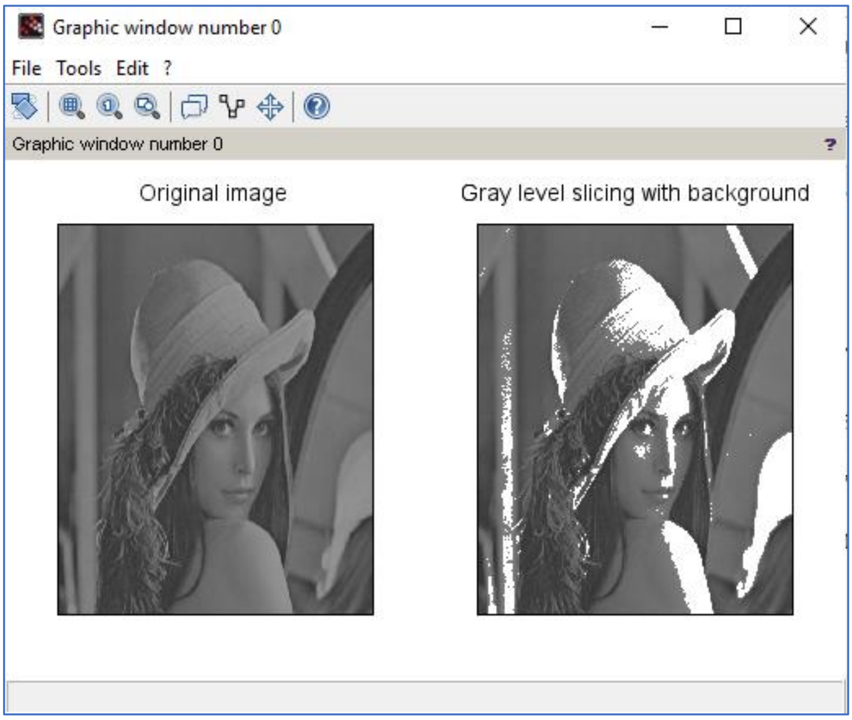
Gray-level slicing with background


Practical_2_6b.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practi...
File Edit Format Options Window Execute ?
Practical_2_6b.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_6b.sce) - SciNotes
Practical_2_6a.sce
Practical_2_6b.sce

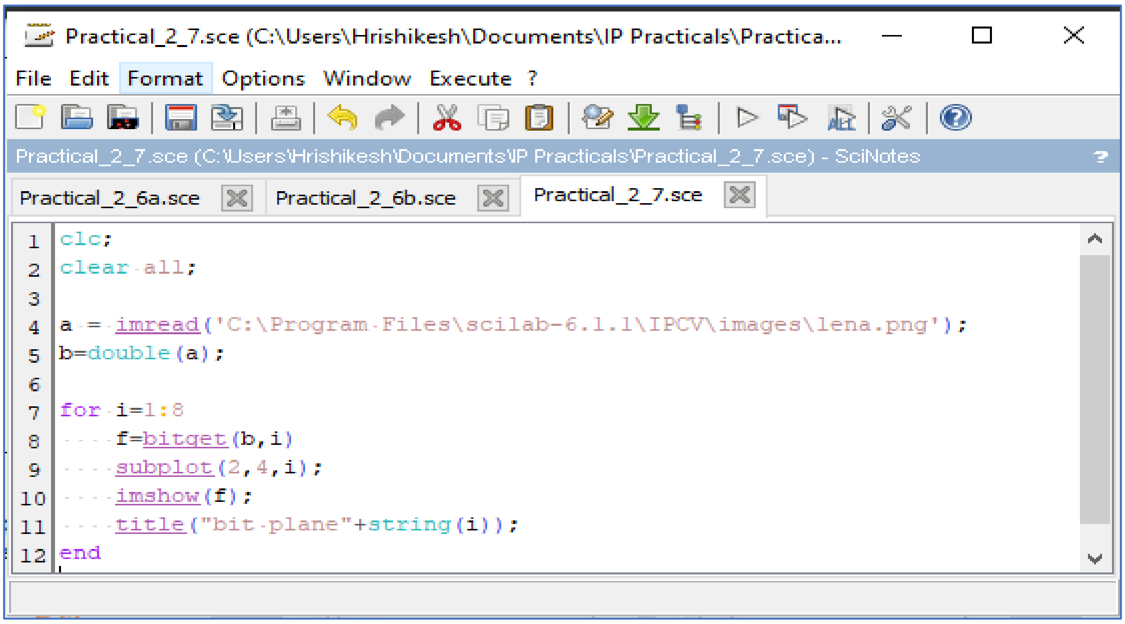
```
clc;
clear all;
a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena_dark.png');
b=double(a);
[m,n]=size(b);
x1=input("Enter x1");
x2=input("Enter x2");

d=zeros(m,n);

for i=1:m
    for j=1:n
        if(b(i,j)>=x1 && b(i,j)<=x2)
            d(i,j)=255;
        else
            d(i,j)=b(i,j);
        end
    end
end
subplot(1,2,1);
imshow(a);
title("Original image");

subplot(1,2,2);
imshow(uint8(d));
title("Gray level slicing with background");

```



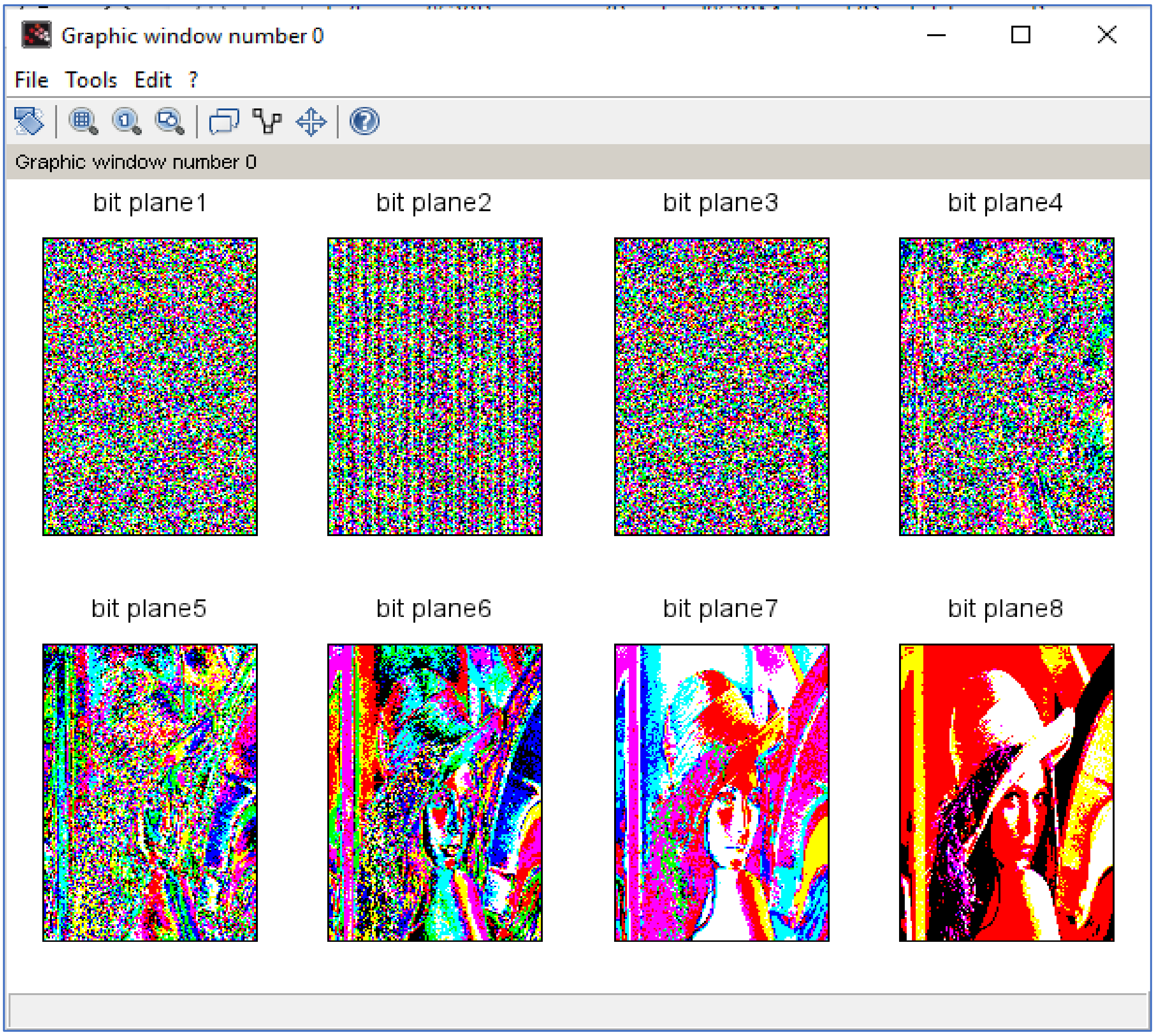
```
Enter x1 125

Enter x2 250

-->
```



c. Bit-plane slicing

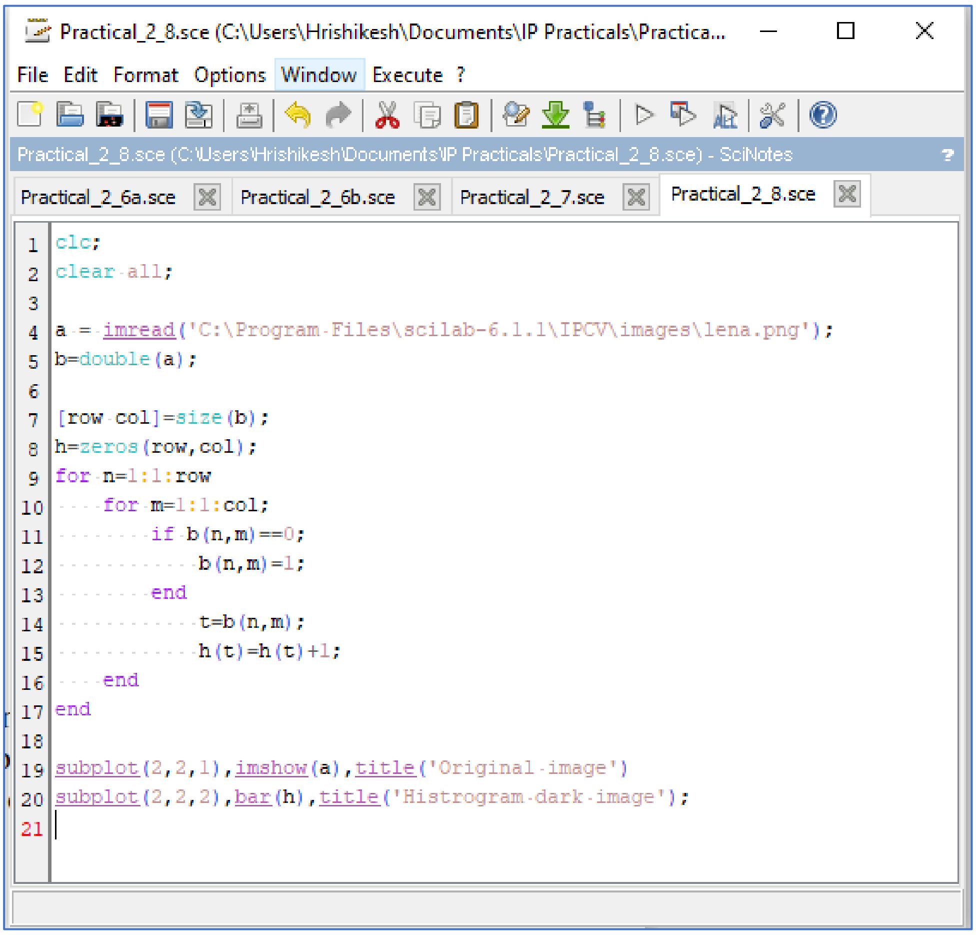

Practical_2_7.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practica...
File Edit Format Options Window Execute ?
Practical_2_7.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_7.sce) - SciNotes
Practical_2_6a.sce
Practical_2_6b.sce
Practical_2_7.sce

```
clc;
clear all;

a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\lena.png');
b=double(a);

for i=1:8
    f=bitget(b,i)
    subplot(2,4,i);
    imshow(f);
    title("bit plane"+string(i));
end
```

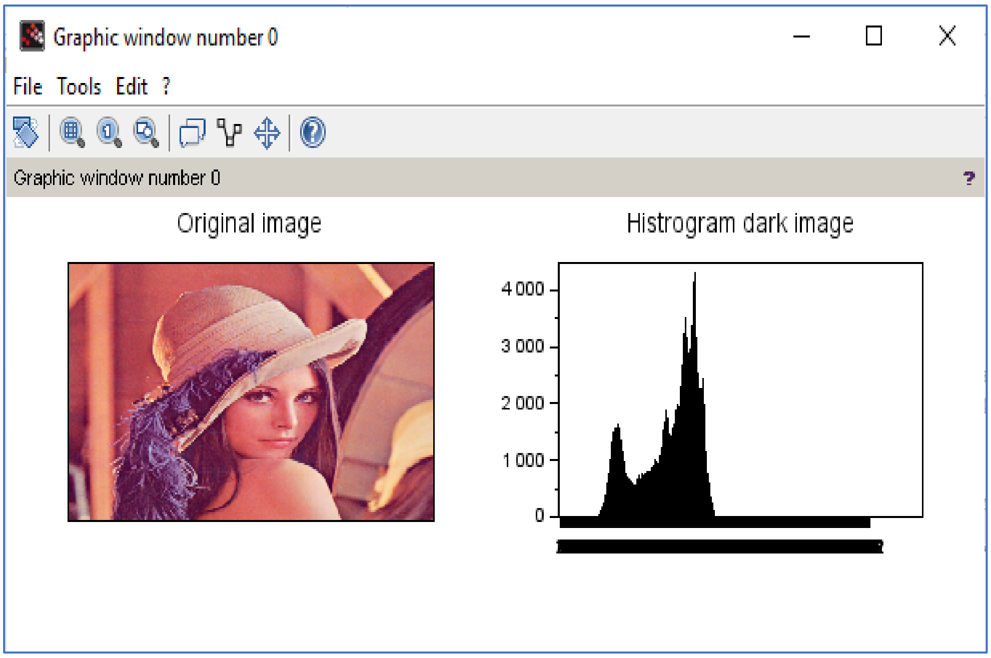

Graphic window number 0
File
Tools
Edit
?
Graphic window number 0
bit plane1
bit plane2
bit plane3
bit plane4
bit plane5
bit plane6
bit plane7
bit plane8

B

1. Program to plot the histogram of an image and categorise


Practical_2_8.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practica...
File Edit Format Options Window Execute ?
Practical_2_8.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_8.sce) - SciNotes
Practical_2_6a.sce
Practical_2_6b.sce
Practical_2_7.sce
Practical_2_8.sce

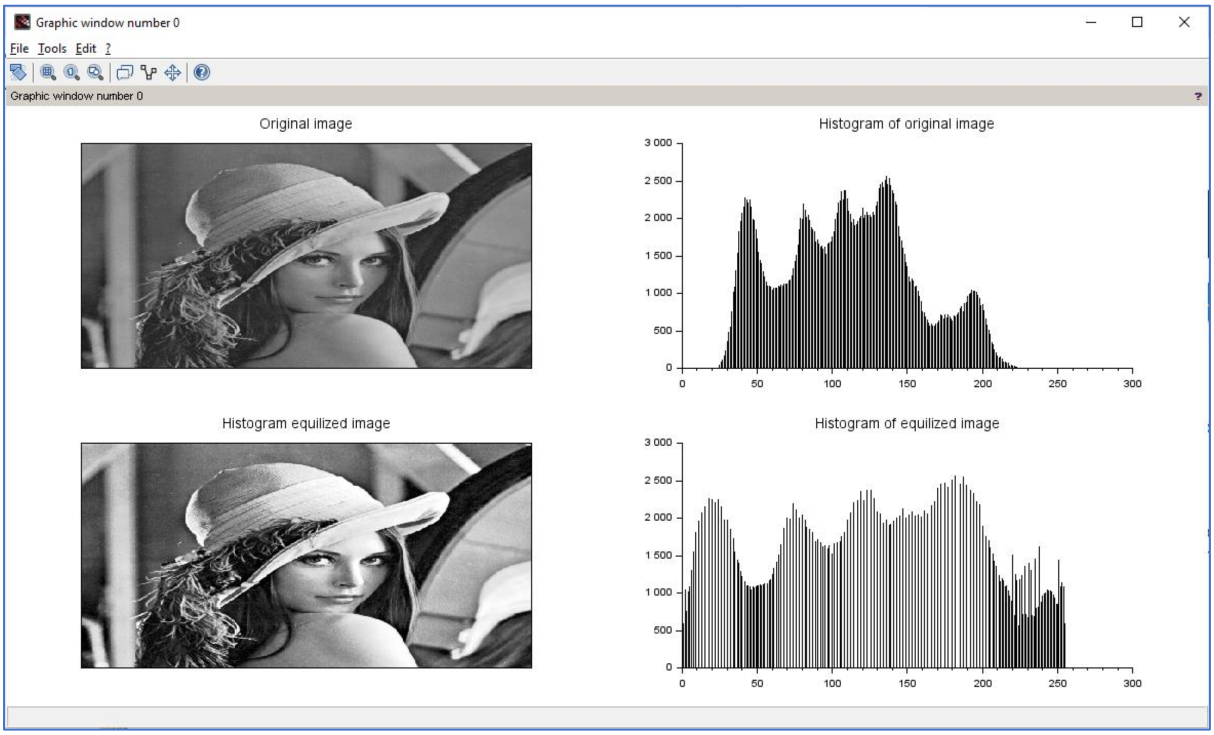
```
clc;
clear all;

a = imread('C:\Program Files\scilab-6.1.1\IPCV\images\lena.png');
b=double(a);

[row col]=size(b);
h=zeros(row,col);
for n=1:1:row
    for m=1:1:col;
        if b(n,m)==0;
            b(n,m)=1;
        end
            t=b(n,m);
            h(t)=h(t)+1;
    end
end

subplot(2,2,1),imshow(a),title('Original image')
subplot(2,2,2),bar(h),title('Histrogram dark image');

```



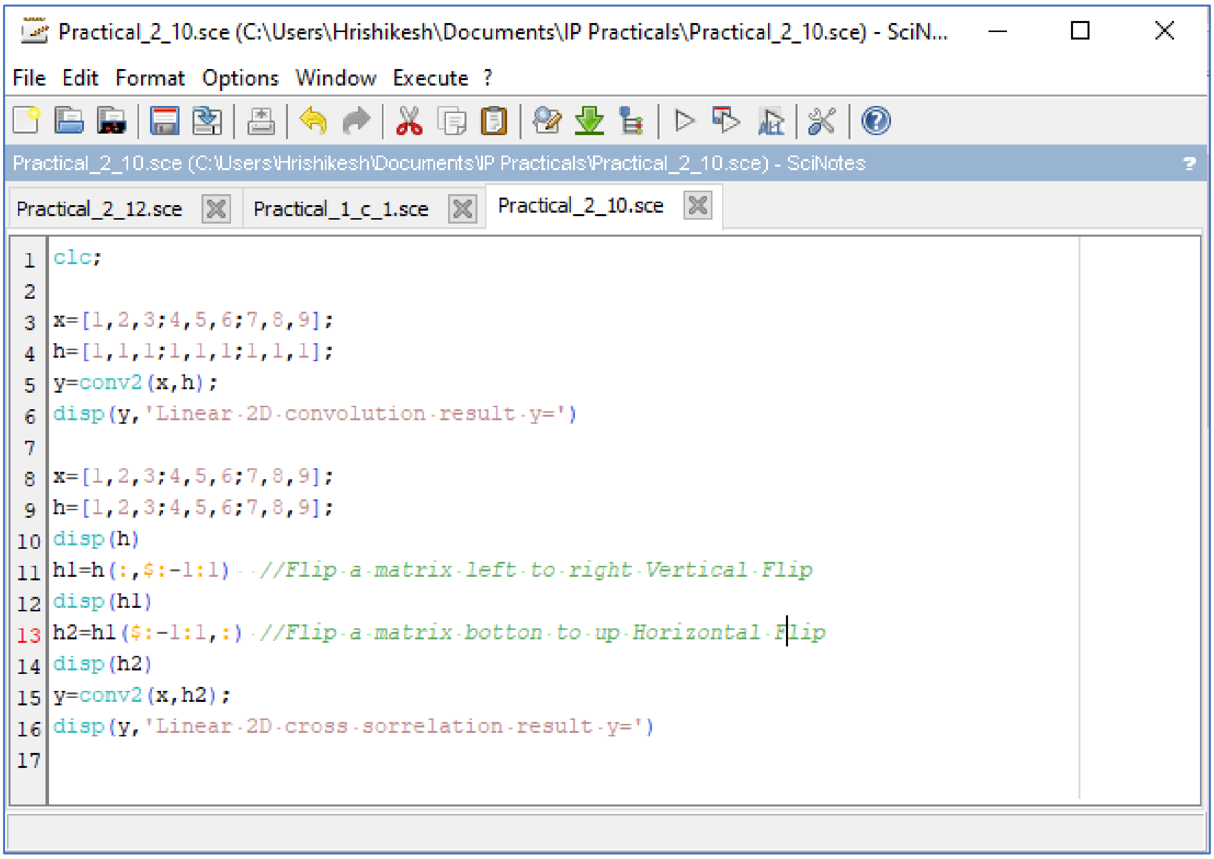
2. Program to apply histogram equalization

```
close all;
clear all;
clc
warning off;
// Read the image
a=imread('C:\Program Files\scilab-6.1.1\IPCV\images\Lena.png');
// Convert to grayscale incase it is color
a = rgb2gray(a);
b=size(a);
a=double(a);

// Loop for Getting the Histogram of the Original image
freq_counts = zeros(1,256);
for i=1:b(1)
   for j=1:b(2)
       for k=0:255
           if a(i,j)==k
               freq_counts(k+1)=freq_counts(k+1)+1;
           end
       end
   end
end

//Generating PDF out of histogram by diving by total no. of pixels
pdf=(1/(b(1)*b(2)))*freq_counts;

//Generating CDF out of PDF
cdf = zeros(1,256);
cdf(1)=pdf(1);
for i=2:256
   cdf(i)=cdf(i-1)+pdf(i);
end
cdf = round(255*cdf);
// histogram equilized image
ep = zeros(b);
for i=1:b(1)                 //loop tracing the rows of image
   for j=1:b(2)            //loop tracing thes columns of image
       t=(a(i,j)+1);        //pixel values in image
       ep(i,j)=cdf(t);      //Making the ouput image using cdf as the transformationfunction
   end
end

// Loop for Getting the Histogram of the Equalized image
hist2 = zeros(1,256);
for i=1:b(1)
   for j=1:b(2)
       for k=0:255
           if ep(i,j)==k
               hist2(k+1)=hist2(k+1)+1;
           end
       end
   end
end
```

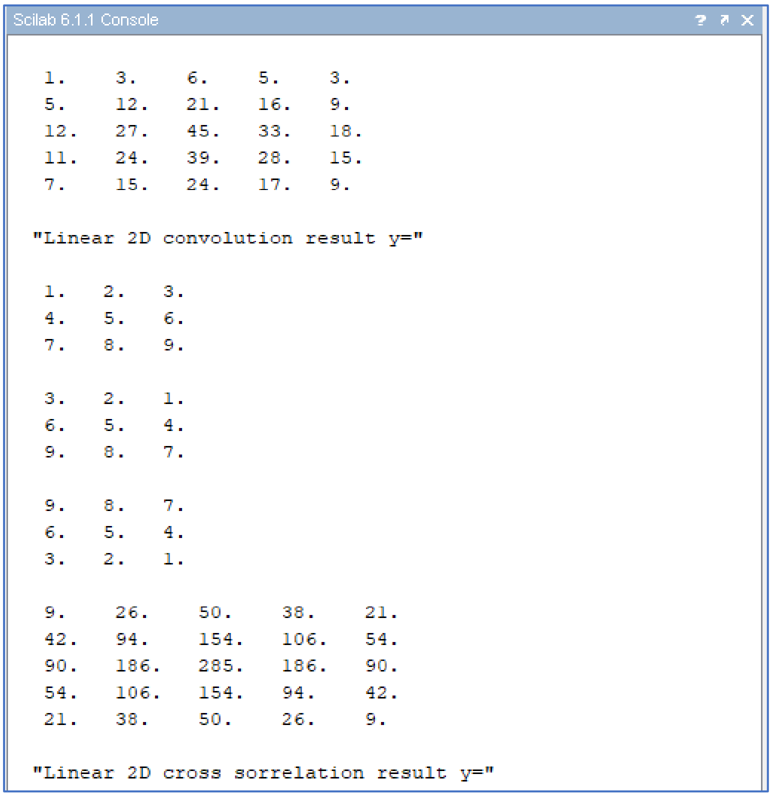
```
subplot(2,2,1);
imshow(uint8(a));title('Original image');
subplot(2,2,3);
imshow(uint8(ep));title('Histogram equalized image');
subplot(2,2,2);
plot2d3([0:255],freq_counts);title('Histogram of original image');
subplot(2,2,4);
plot2d3([0:255],hist2);title('Histogram of equalized image');
```



C Write a program to perform convolution and correlation


Practical_2_10.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_10.sce) - SciN...
File Edit Format Options Window Execute ?
Practical_2_10.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_10.sce) - SciNotes
Practical_2_12.sce
Practical_1_c_1.sce
Practical_2_10.sce

```
clc;

x=[1,2,3;4,5,6;7,8,9];
h=[1,1,1;1,1,1;1,1,1];
y=conv2(x,h);
disp(y,'Linear 2D convolution result y=')

x=[1,2,3;4,5,6;7,8,9];
h=[1,2,3;4,5,6;7,8,9];
disp(h)
h1=h(:,$:-1:1)  //Flip a matrix left to right Vertical Flip
disp(h1)
h2=h1($:-1:1,:) //Flip a matrix botton to up Horizontal Flip
disp(h2)
y=conv2(x,h2);
disp(y,'Linear 2D cross sorrelation result y=')

```

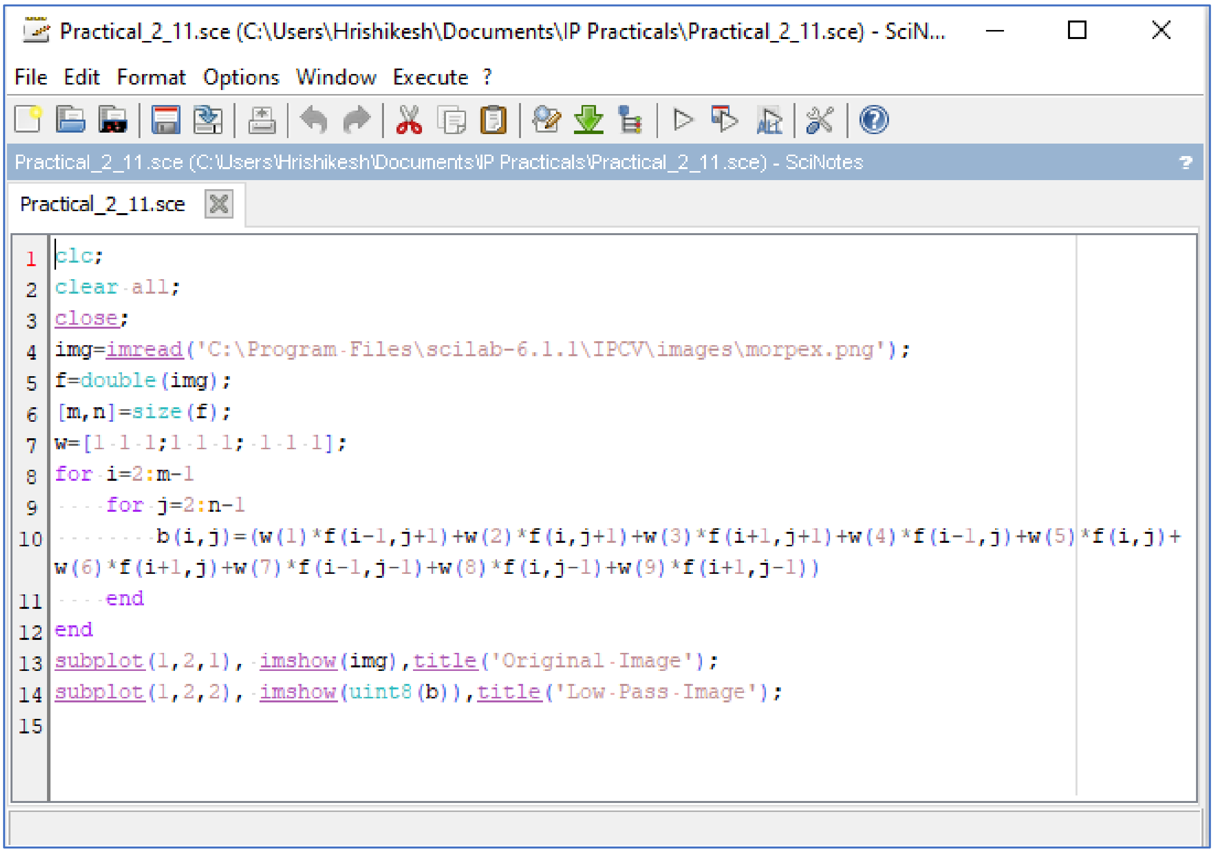


```
  1.    3.    6.    5.    3.
  5.    12.   21.   16.   9.
  12.   27.   45.   33.   18.
  11.   24.   39.   28.   15.
  7.    15.   24.   17.   9.

 "Linear 2D convolution result y="

  1.   2.   3.
  4.   5.   6.
  7.   8.   9.

  3.   2.   1.
  6.   5.   4.
  9.   8.   7.

  9.   8.   7.
  6.   5.   4.
  3.   2.   1.

  9.    26.    50.    38.    21.
  42.   94.    154.   106.   54.
  90.   186.   285.   186.   90.
  54.   106.   154.   94.    42.
  21.   38.    50.    26.    9.

 "Linear 2D cross sorrelation result y="
```

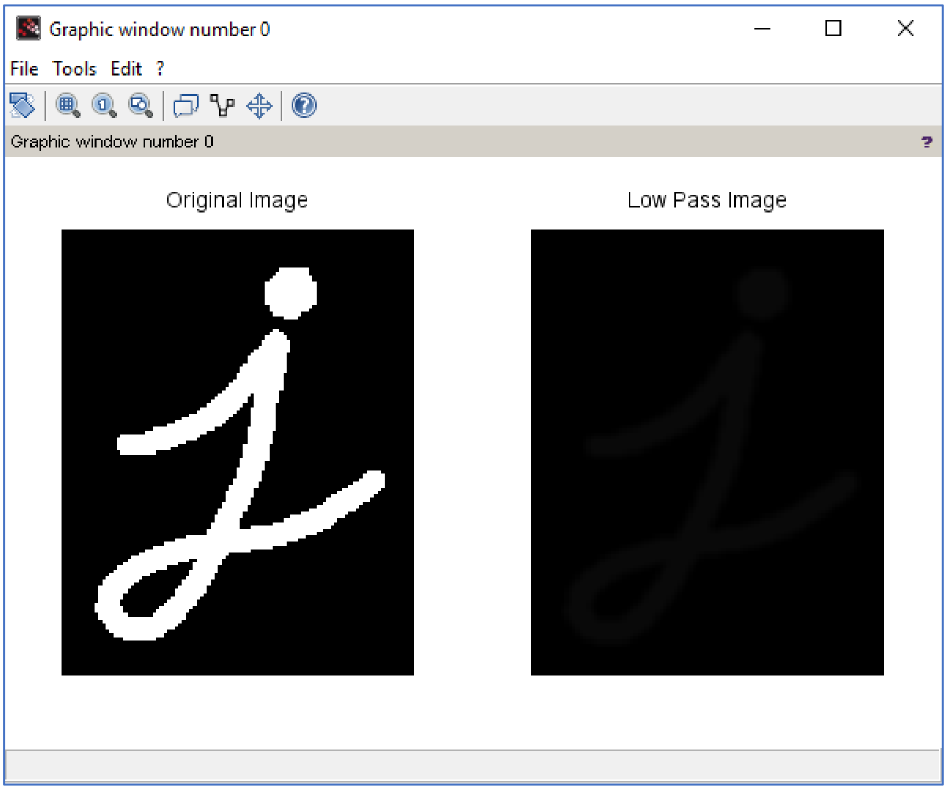
D Write a program to apply smoothing and sharpening filters on grayscale and color images

Note: Use all kernels mentioned in the reference book

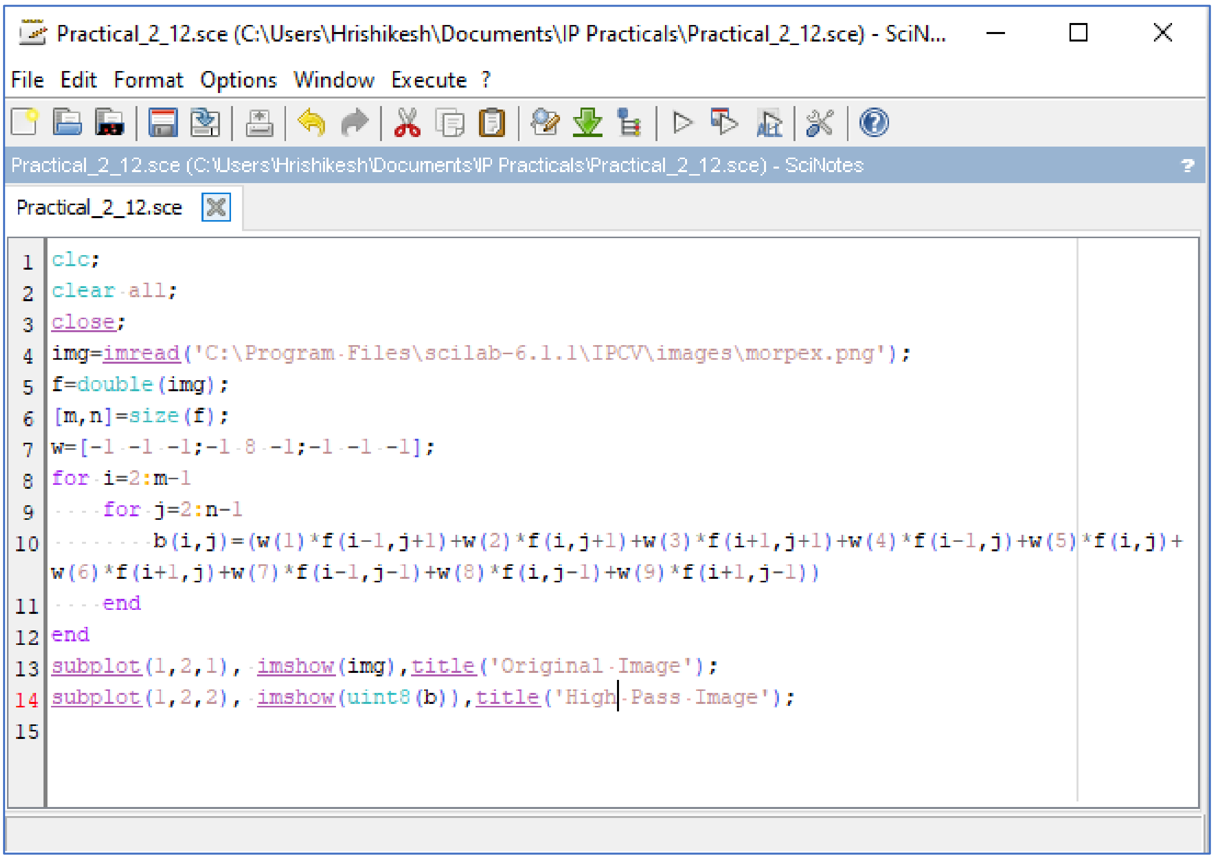
a) Low Pass


Practical_2_11.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_11.sce) - SciN...
File Edit Format Options Window Execute ?
Practical_2_11.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_11.sce) - SciNotes
Practical_2_11.sce

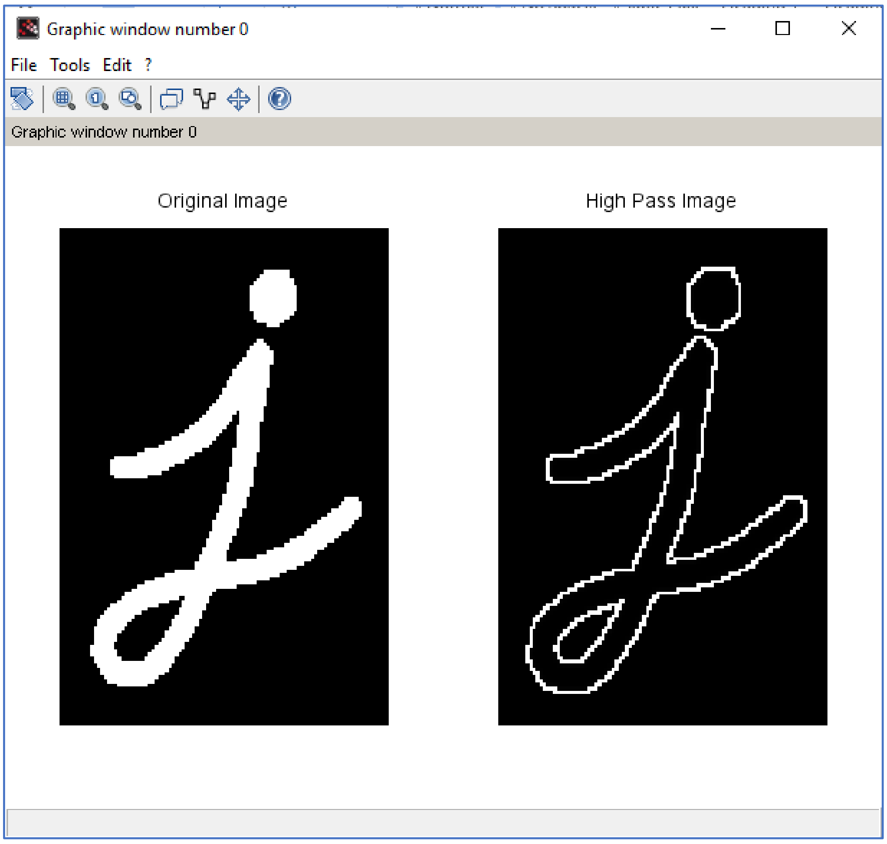
```
clc;
clear all;
close;
img=imread('C:\Program Files\scilab-6.1.1\IPCV\images\morpex.png');
f=double(img);
[m,n]=size(f);
w=[1 1 1;1 1 1; 1 1 1];
for i=2:m-1
    for j=2:n-1
        b(i,j)=(w(1)*f(i-1,j+1)+w(2)*f(i,j+1)+w(3)*f(i+1,j+1)+w(4)*f(i-1,j)+w(5)*f(i,j)+w(6)*f(i+1,j)+w(7)*f(i-1,j-1)+w(8)*f(i,j-1)+w(9)*f(i+1,j-1))
    end
end
subplot(1,2,1), imshow(img),title('Original Image');
subplot(1,2,2), imshow(uint8(b)),title('Low Pass Image');
```



b) High Pass


Practical_2_12.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_12.sce) - SciN...
File Edit Format Options Window Execute ?
Practical_2_12.sce (C:\Users\Hrishikesh\Documents\IP Practicals\Practical_2_12.sce) - SciNotes
Practical_2_12.sce

```
clc;
clear all;
close;
img=imread('C:\Program Files\scilab-6.1.1\IPCV\images\morpex.png');
f=double(img);
[m,n]=size(f);
w=[-1 -1 -1;-1 8 -1;-1 -1 -1];
for i=2:m-1
    for j=2:n-1
        b(i,j)=(w(1)*f(i-1,j+1)+w(2)*f(i,j+1)+w(3)*f(i+1,j+1)+w(4)*f(i-1,j)+w(5)*f(i,j)+w(6)*f(i+1,j)+w(7)*f(i-1,j-1)+w(8)*f(i,j-1)+w(9)*f(i+1,j-1))
    end
end
subplot(1,2,1), imshow(img),title('Original Image');
subplot(1,2,2), imshow(uint8(b)),title('High Pass Image');
```


Graphic window number 0
File Tools Edit ?
Graphic window number 0
Original Image
High Pass Image