Classes 8 - Colormaps, RGB color space

Exercise 1 . Create a figure consisting of two parts: one will display a portrait.jpg picture with an imposed colormap, the other - a plot of this colormap, properly signed (as in the picture below). The user should be able to switch between colormaps using the drop-down menu in the bottom left corner. Use the following colormaps: autumn, bone, cool, copper, hot, hsv, jet, pink, prism, spring, summer, winter.Task on table 5.1.

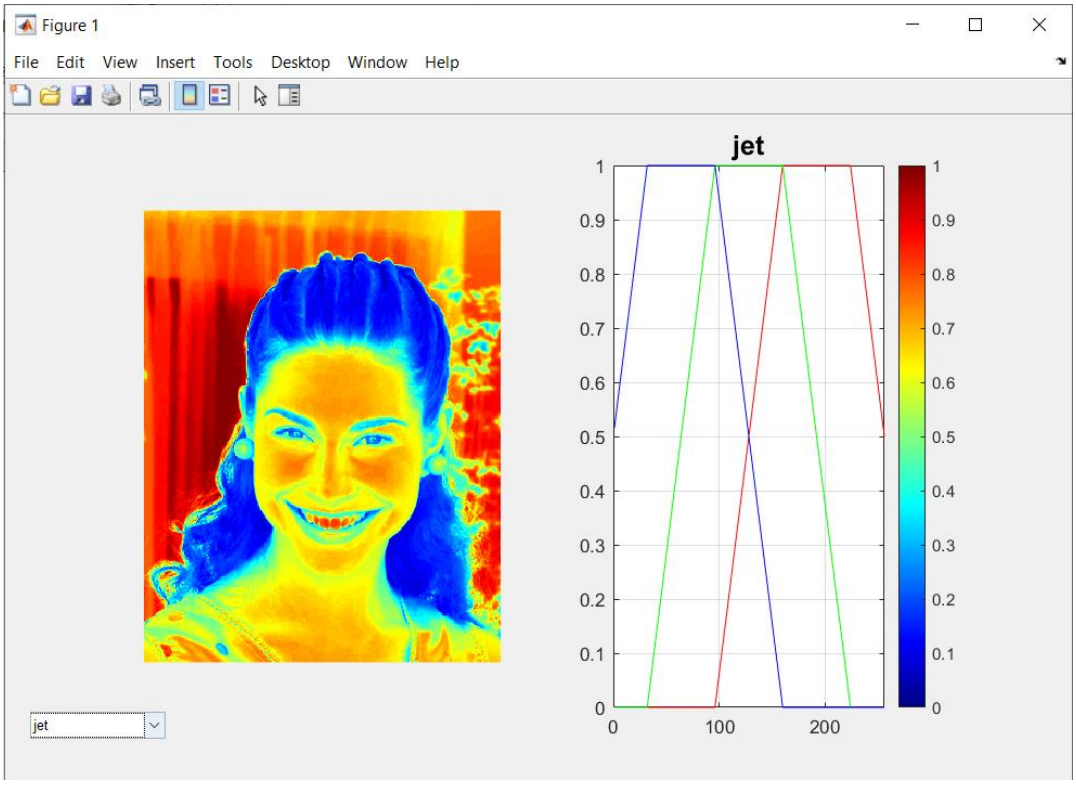
Table 5.1

Variant number	Colormap
1	jet , autumn

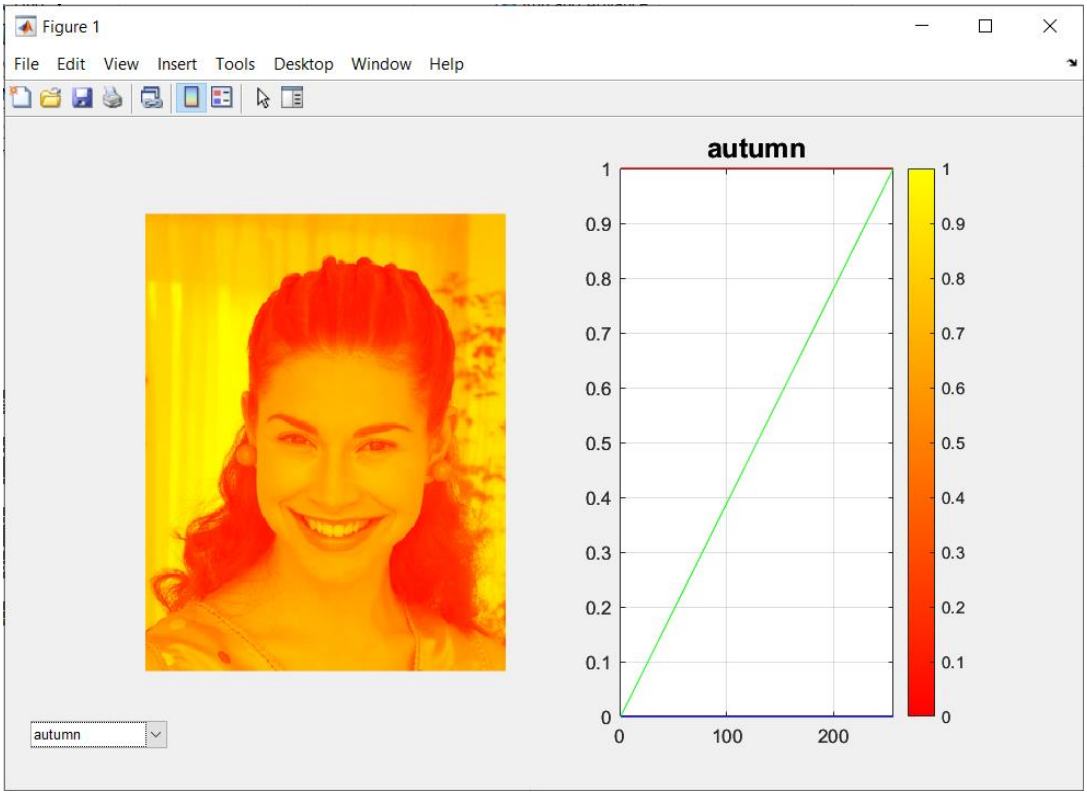
Output code :

```
L1=imread('portrait.jpg');
figure(1)
imshow(zeros(500,800));
subplot(1,2,1),imshow(L1)
axis off
uicontrol(1,'Style', 'popup',...
'String', 'jet|autumn',...
'Position', [20 1 100 50],...
'Callback', @setmap);
function setmap(h,event)
val = get(h,'Value');
switch val
case 1
colormap(jet)
map = jet;
t = 'jet';
case 2
```

```
colormap("autumn")
map = autumn;
t = 'autumn';
end
subplot(1,2,2),rgbplot (map),axis([0 256 0 1]),grid,colorbar
('horiz'),title(t,'FontSize',15);
end
```



Pic.5.1



Pic.5.2

Exercise 2 . A color map is a matrix consisting of three columns, each containing 256 elements within the range [0,1]. Create your own colormap, display its plot, and impose it on the portrait.jpg. Task on table 5.2.

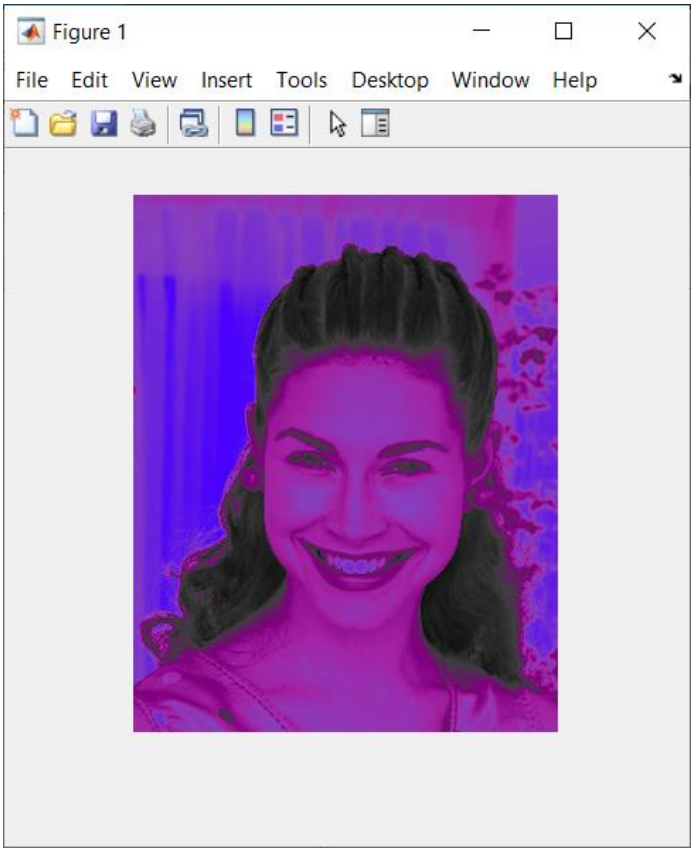
Table 5.2

Variant number	X y z
1	164 64 256

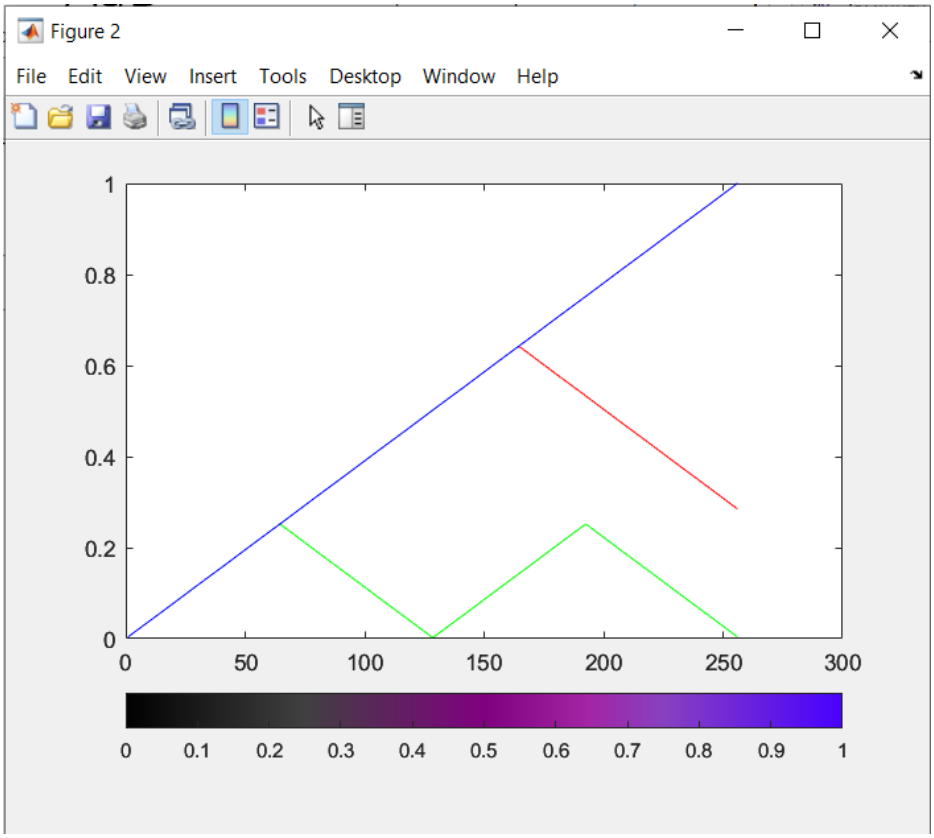
Output code :

```
L1=imread('portrait.jpg');
x = (1:164)'/256;
y = (1:64)'/256;
z = (1:256)'/256;
r = [x ; flipud(x([72:163]))];
g = [y; flipud(y); y; flipud(y)];
b = z;
map= [r g b];
```

```
figure;
imshow(L1);
colormap(map);
figure;
rgbplot(map);
colorbar('horiz');
colormap(map);
```



Pic.5.3

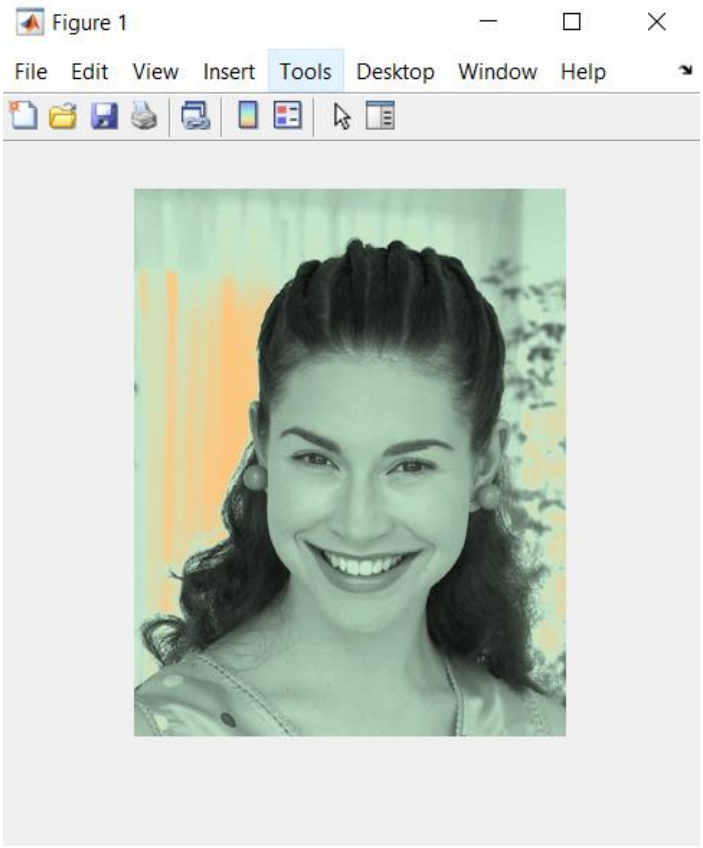


Pic.5.4

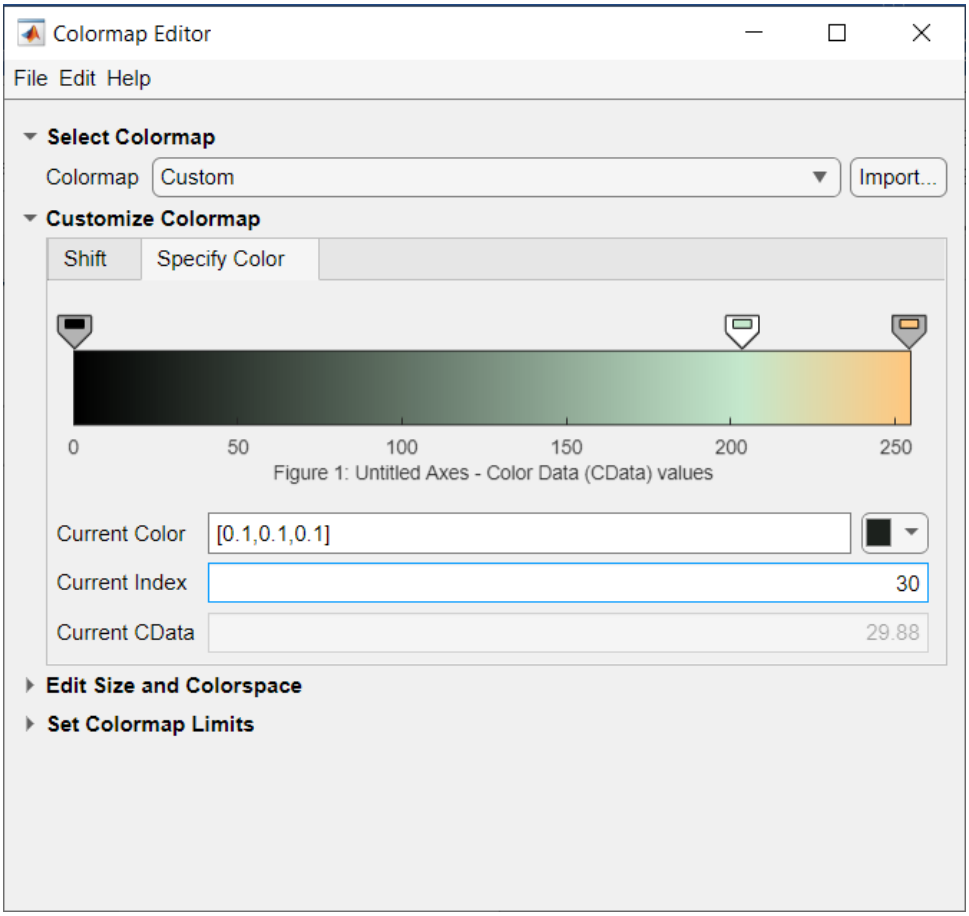
Exercise 3 . With the use of colormap editor, try to create your own colormap in the way that the teeth can be distinguished in the face.jpg image. You can use the imtool tool to accurately determine pixel values.

Output code :

```
L1=imread('portrait.jpg');
imshow(L1);
colormapeditor
imtool
```



Pic.5.5 – Image with own colormap



Pic.5.6 – Own colormap

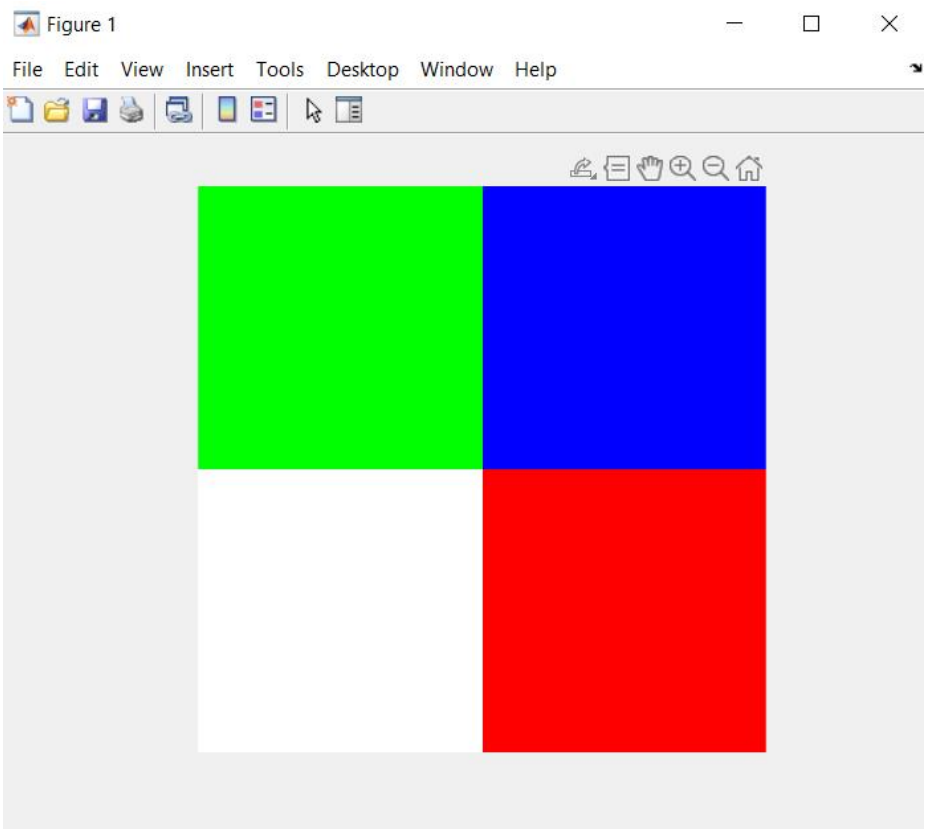
Exercise 4 Create two images, size 2 x 2 pixels in RGB color space, and the given layout. Task on table 5.3.

Table 5.3

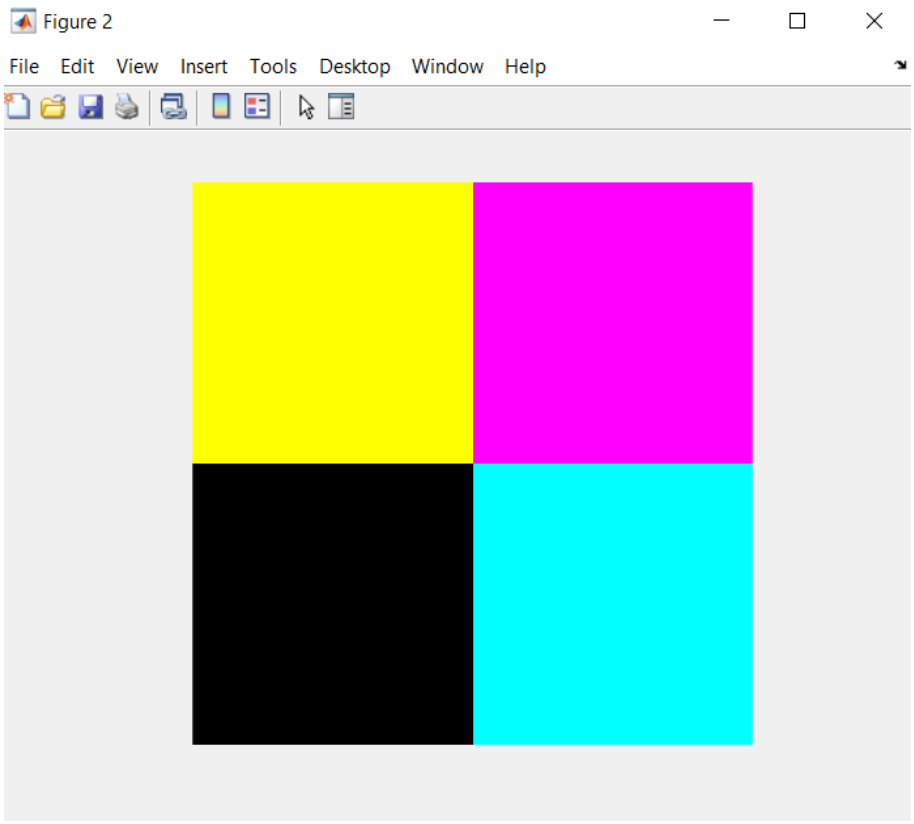
Variant number	Figure 1	Figure 2
1	1 1 1 1	1 1 1 1 1 1

Output code :

```
L1 = zeros(2,2,3)
L1(1,1,2) = 1
L1(1,2,3) = 1
L1(2,1,:) = 1
L1(2,2,1) = 1
figure
imshow(L1,'InitialMagnification','fit')
L1 = zeros(2,2,3)
L1(1,1,2) = 1
L1(1,1,1) = 1
L1(1,2,1) = 1
L1(1,2,3) = 1
L1(2,2,3) = 1
L1(2,2,2) = 1
figure
imshow(L1,'InitialMagnification','fit')
```



Pic.5.7



Pic.5.8

Conclusions : on the lesson was learned about colormaps and rgb-colorspace . Also has improved practical skills .