PROJECT-1

In [1]:
```
import numpy as np #for array manipulations
import matplotlib.pyplot as plt #for visualization
from PIL import Image #for reading image
```

In [15]:
```
img = Image.open(r'C:\Users\jayes\OneDrive\Desktop\jayesh.jpg')
img
```

Out[15]:

In [17]:
```
type(img)
```

Out[17]:
```
PIL.JpegImagePlugin.JpegImageFile
```

In [21]:
```
img_arr=np.asarray(img) #Convert the input to an array.
img_arr
```

Out[21]:
```
array([[[252, 252, 252],
        [254, 254, 254],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[252, 252, 252],
        [254, 254, 254],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[252, 252, 252],
        [254, 254, 254],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       ...,

       [[250, 250, 250],
        [254, 254, 254],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],

       [[253, 253, 253],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]],
```

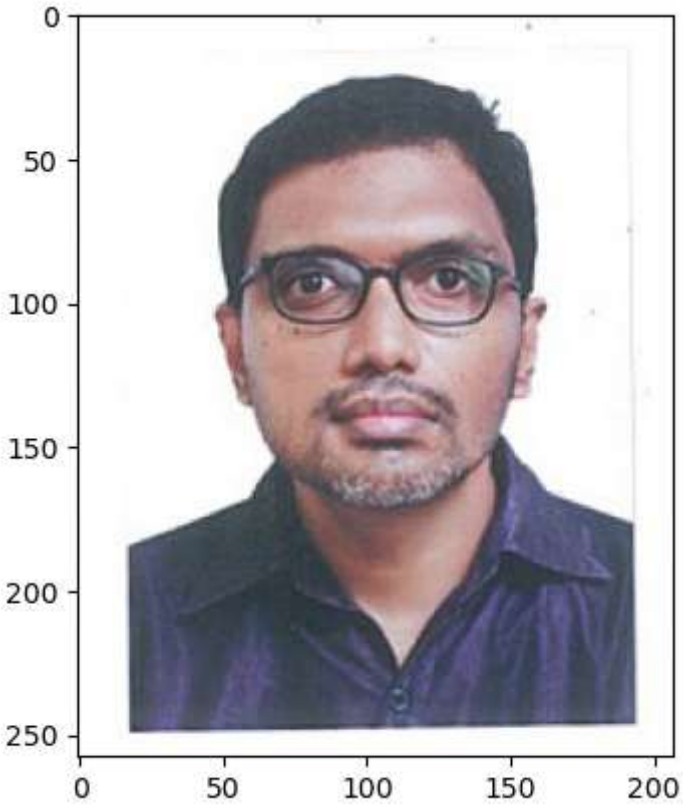
```
       [[253, 253, 253],
        [255, 255, 255],
        [255, 255, 255],
        ...,
        [255, 255, 255],
        [255, 255, 255],
        [255, 255, 255]]], dtype=uint8)
```

In [25]:
```
type(img_arr)
```

Out[25]:
```
numpy.ndarray
```

In [29]:
```
#visualing using plt
plt.imshow(img_arr)          #display data as image
```

Out[29]:
```
<matplotlib.image.AxesImage at 0x19c6dcb7380>
```



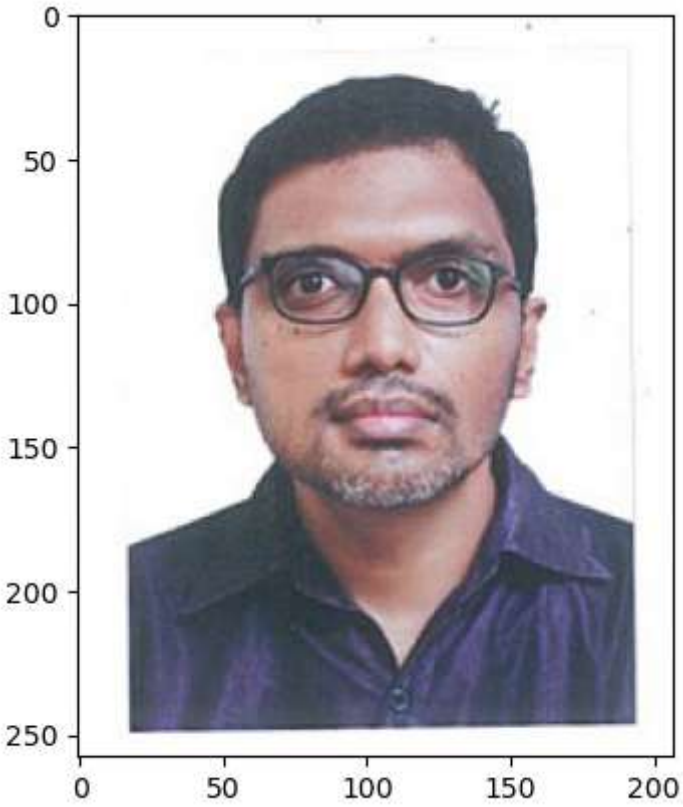
In [31]:
```
img_arr.shape
```

Out[31]:
```
(258, 207, 3)
```

In [89]:
```
img_arr1 = img_arr.copy() #copying to another array
```

In [91]:
```
plt.imshow(img_arr1)
```

Out[91]:
```
<matplotlib.image.AxesImage at 0x19c6f8db4d0>
```



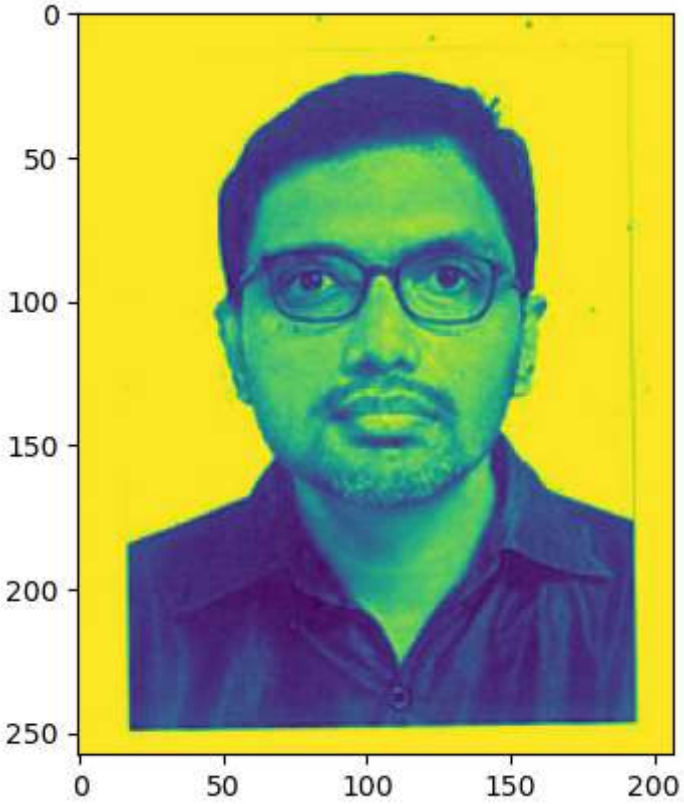
In [39]:
```
img_arr == img_arr1
```

Out[39]:
```
array([[[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       ...,

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],

       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]],
```

```
       [[ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True],
        ...,
        [ True,  True,  True],
        [ True,  True,  True],
        [ True,  True,  True]]])
```

In [47]:
```
plt.imshow(img_arr1[ : , : , 0])                    #extract red channel & [height : width : channel] & channel - RGB
```

Out[47]: <matplotlib.image.AxesImage at 0x19c6f557260>

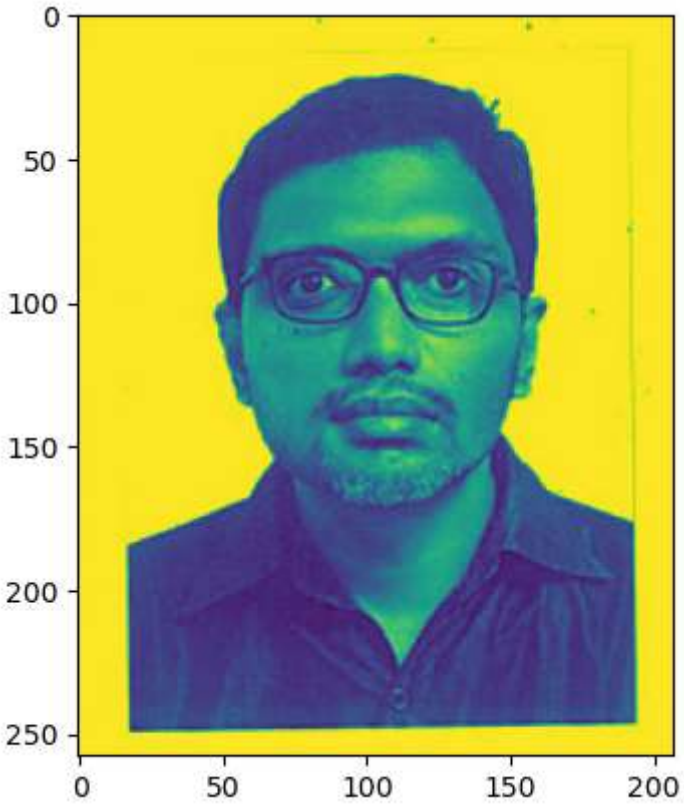


In [99]:
```
img_arr1[ : , : , 0]
```

Out[99]:
```
array([[252, 254, 255, ..., 255, 255, 255],
       [252, 254, 255, ..., 255, 255, 255],
       [252, 254, 255, ..., 255, 255, 255],
       ...,
       [250, 254, 255, ..., 255, 255, 255],
       [253, 255, 255, ..., 255, 255, 255],
       [253, 255, 255, ..., 255, 255, 255]], dtype=uint8)
```

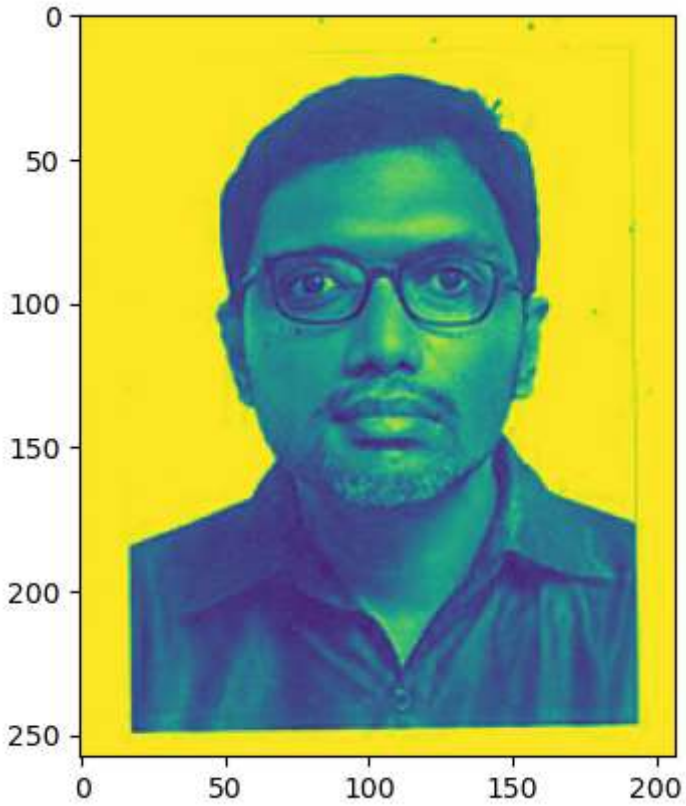
In [93]:
```
plt.imshow(img_arr1[ : , : , 1])                    #extract green channel
```

Out[93]:
```
<matplotlib.figure.AxesImage at 0x19c6f8f3f20>
```



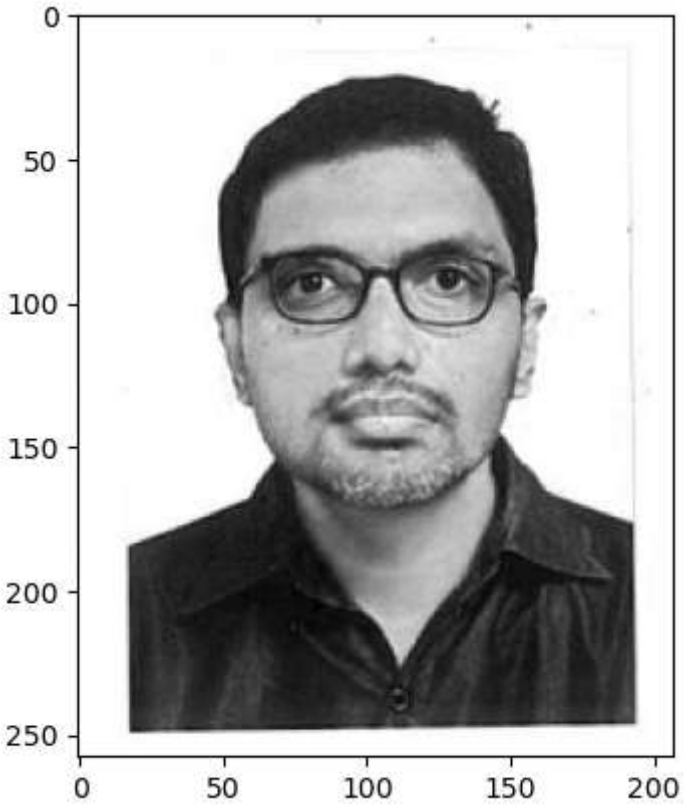
In [53]:
```
plt.imshow(img_arr1[ : ,: , 2])                          # extract blue channel
```

Out[53]:
```
<matplotlib.figure.AxesImage at 0x19c6f670200>
```



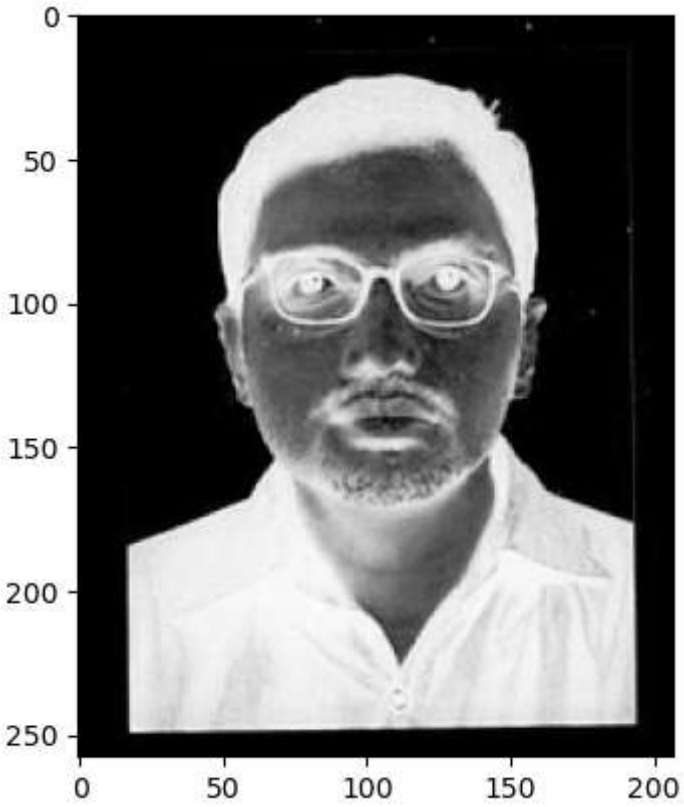
In [55]:
```
plt.imshow(img_arr1[:,:,0],cmap='gray')                    #display extrated red channel as a gray scale image
```

Out[55]: <matplotlib.image.AxesImage at 0x19c6f4cce00>



In [57]:
```
plt.imshow(img_arr1[:,:,0],cmap='Greys')
```

Out[57]:
```
<matplotlib.image.AxesImage at 0x19c6fd9fd10>
```

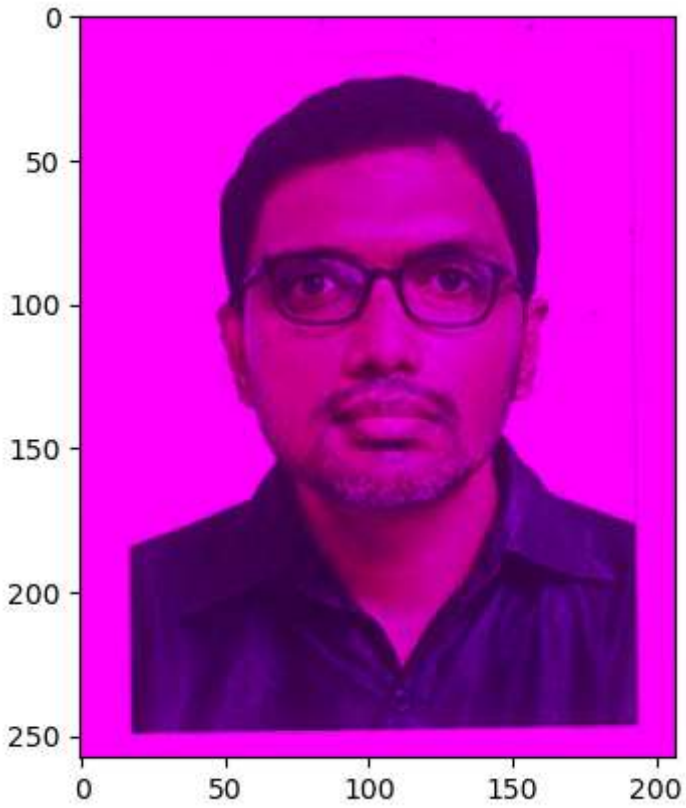


In [129…
```
img_arr1 = img_arr.copy()
```

In [131…
```
img_arr1[ : , : , 1] = 0
```

In [133…
```
plt.imshow(img_arr1)
```

Out[133…
```
<matplotlib.image.AxesImage at 0x19c72055010>
```

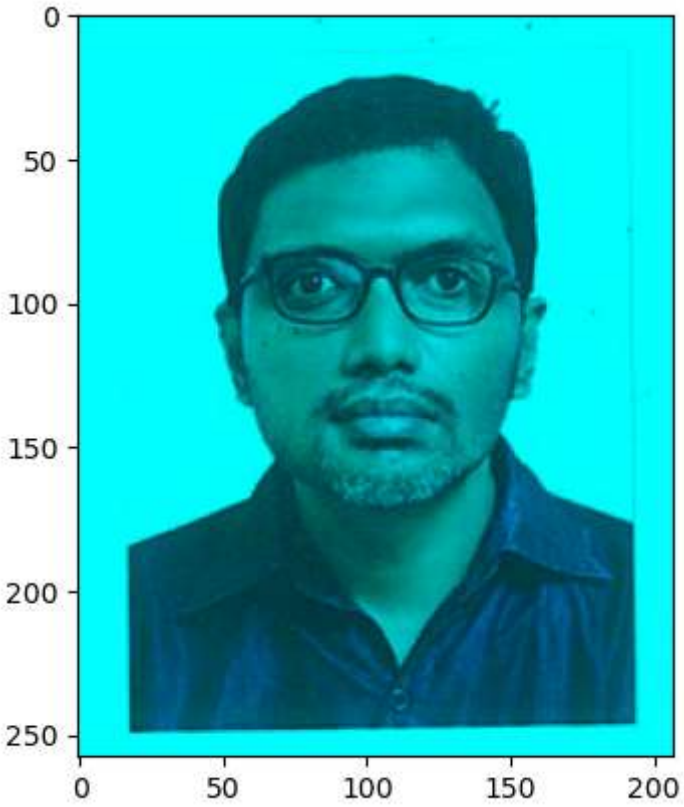


In [117…
```
img_arr1 = img_arr.copy()
```

In [119…
```
img_arr1[ : , : , 0] = 0
```

In [121…
```
plt.imshow(img_arr1)
```

Out[121… `<matplotlib.image.AxesImage at 0x19c70df7980>`

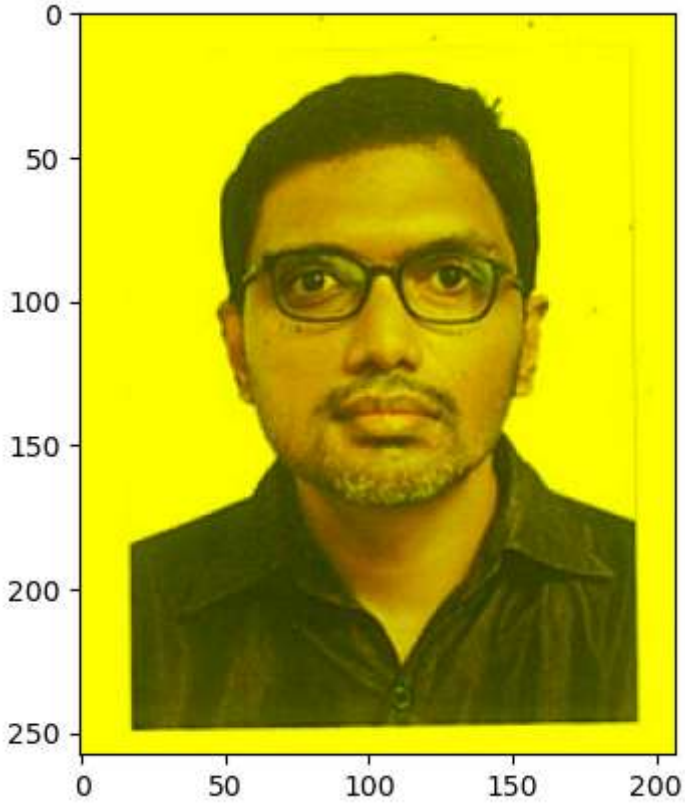


In [123…
```
img_arr1 = img_arr.copy()
```

In [125…
```
img_arr1[ : , : , 2] = 0
```

In [127…
```
plt.imshow(img_arr1)
```

Out[127…
```
<matplotlib.image.AxesImage at 0x19c70e622a0>
```


0
50
100
150
200
250
0
50
100
150
200