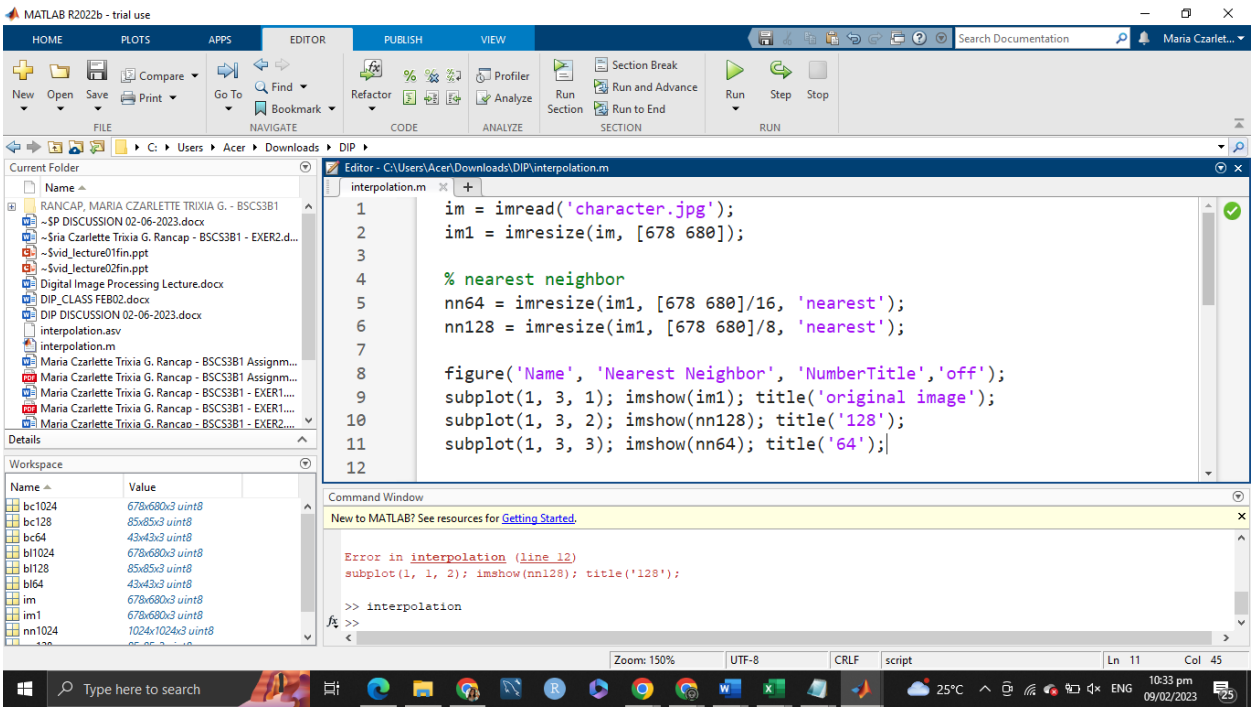
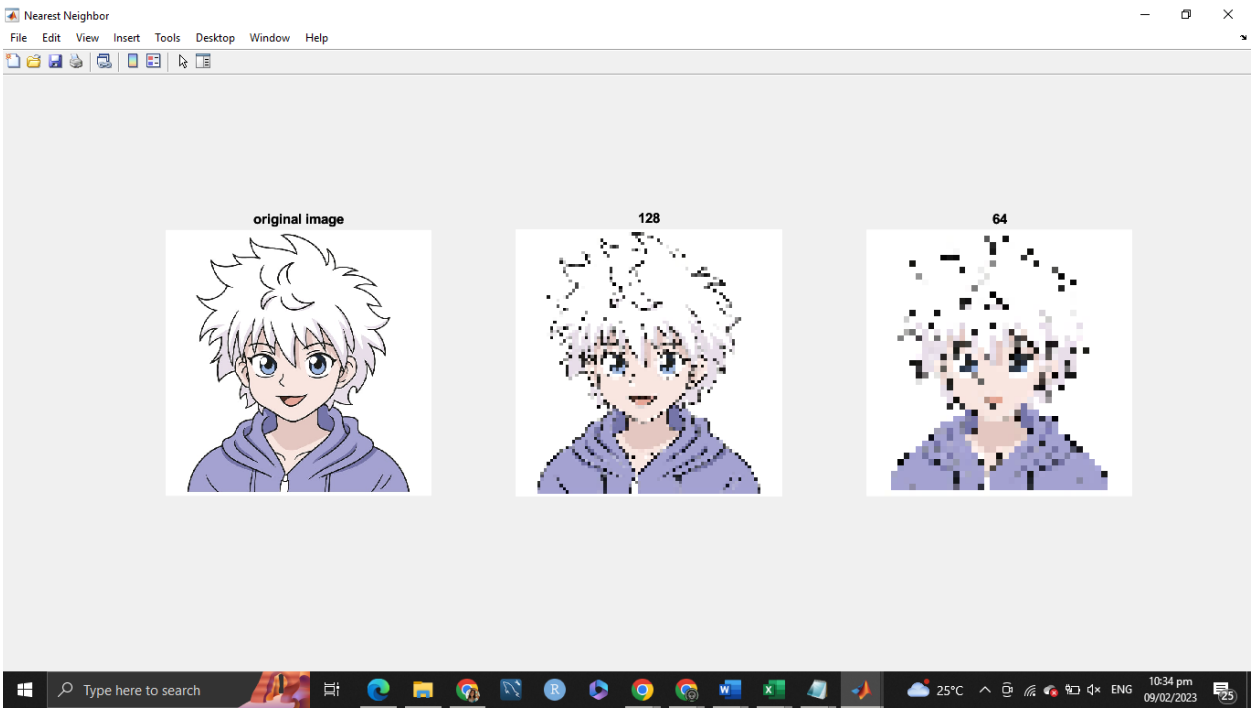
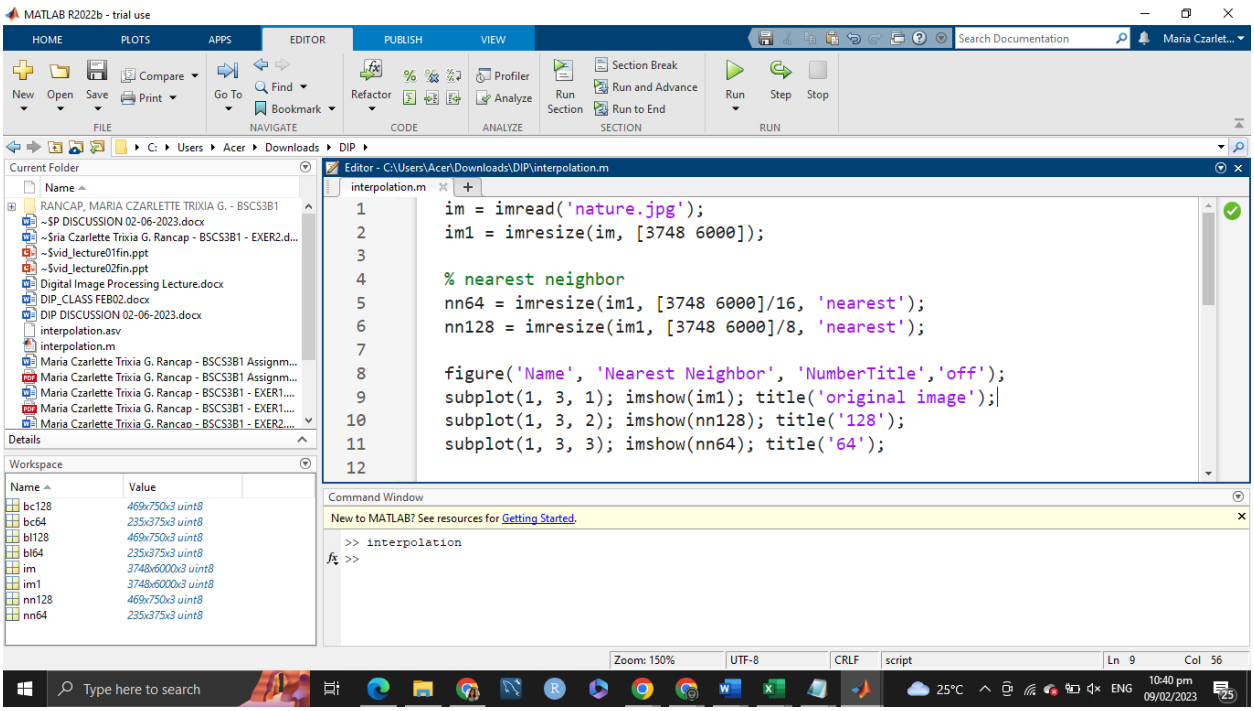
Maria Czarlette Trixia G. Rancap Digital Image Processing

BSCS3B1 EXER2

1. Nearest Neighbor Interpolation






MATLAB R2022b - trial use
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Maria Czarlette Trixia G. Rancap - BSCS3B1 - EXER1....
Maria Czarlette Trixia G. Rancap - BSCS3B1 - EXER2....
Details
Workspace
Name
Value
bc128 469x750x3 uint8
bc64 235x375x3 uint8
bl128 469x750x3 uint8
bl64 235x375x3 uint8
im 3748x6000x3 uint8
im1 3748x6000x3 uint8
nn128 469x750x3 uint8
nn64 235x375x3 uint8
Editor - C:\Users\Acer\Downloads\DIP\interpolation.m
interpolation.m
1 im = imread('nature.jpg');
2 im1 = imresize(im, [3748 6000]);
3
4 % nearest neighbor
5 nn64 = imresize(im1, [3748 6000]/16, 'nearest');
6 nn128 = imresize(im1, [3748 6000]/8, 'nearest');
7
8 figure('Name', 'Nearest Neighbor', 'NumberTitle','off');
9 subplot(1, 3, 1); imshow(im1); title('original image');
10 subplot(1, 3, 2); imshow(nn128); title('128');
11 subplot(1, 3, 3); imshow(nn64); title('64');
12
Command Window
New to MATLAB? See resources for Getting Started.
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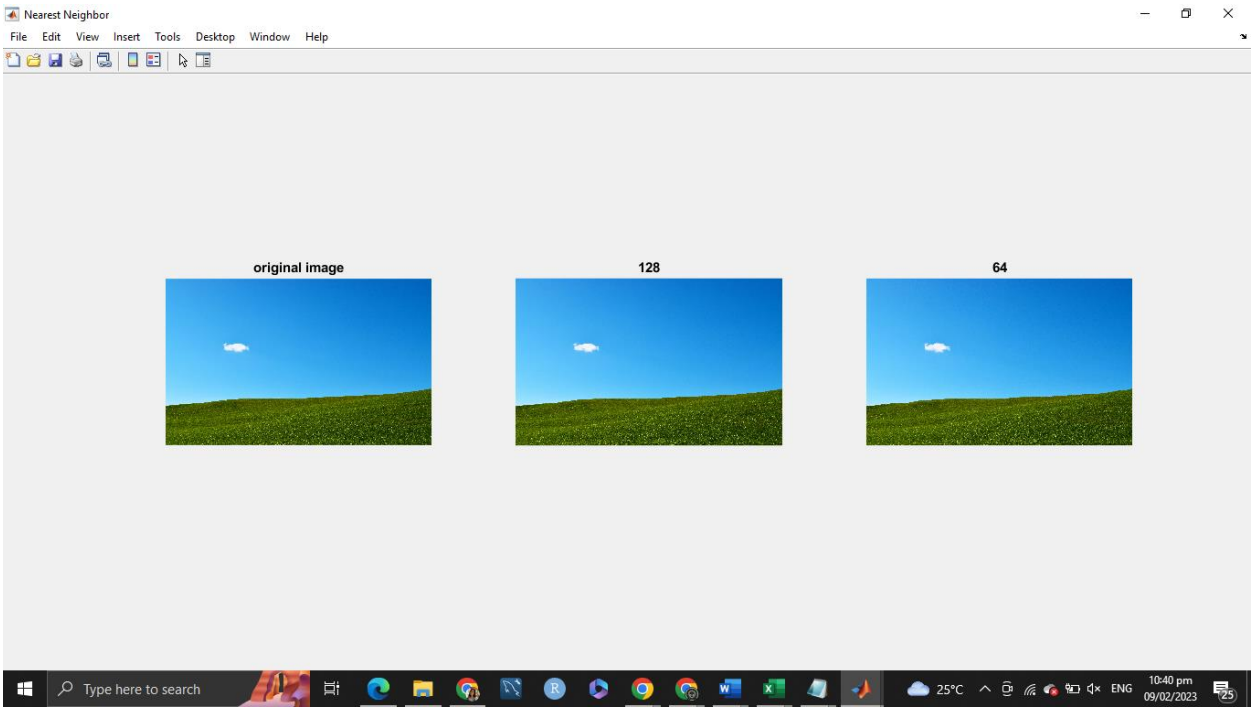
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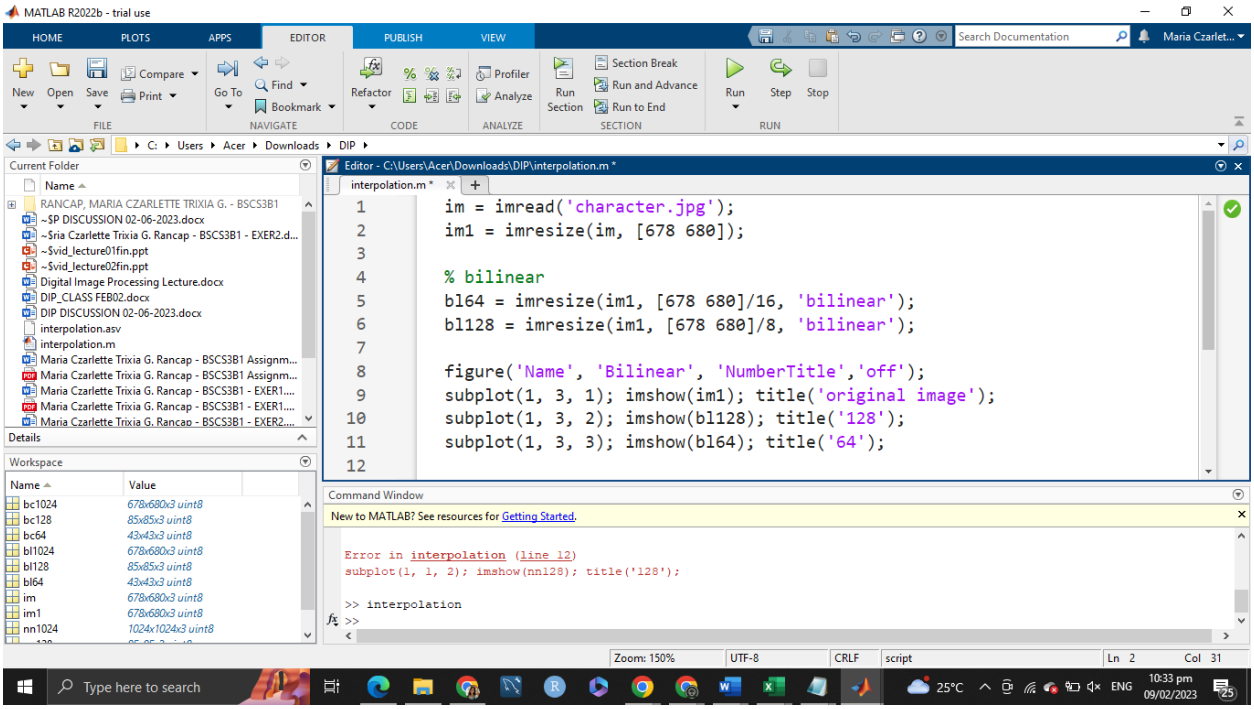
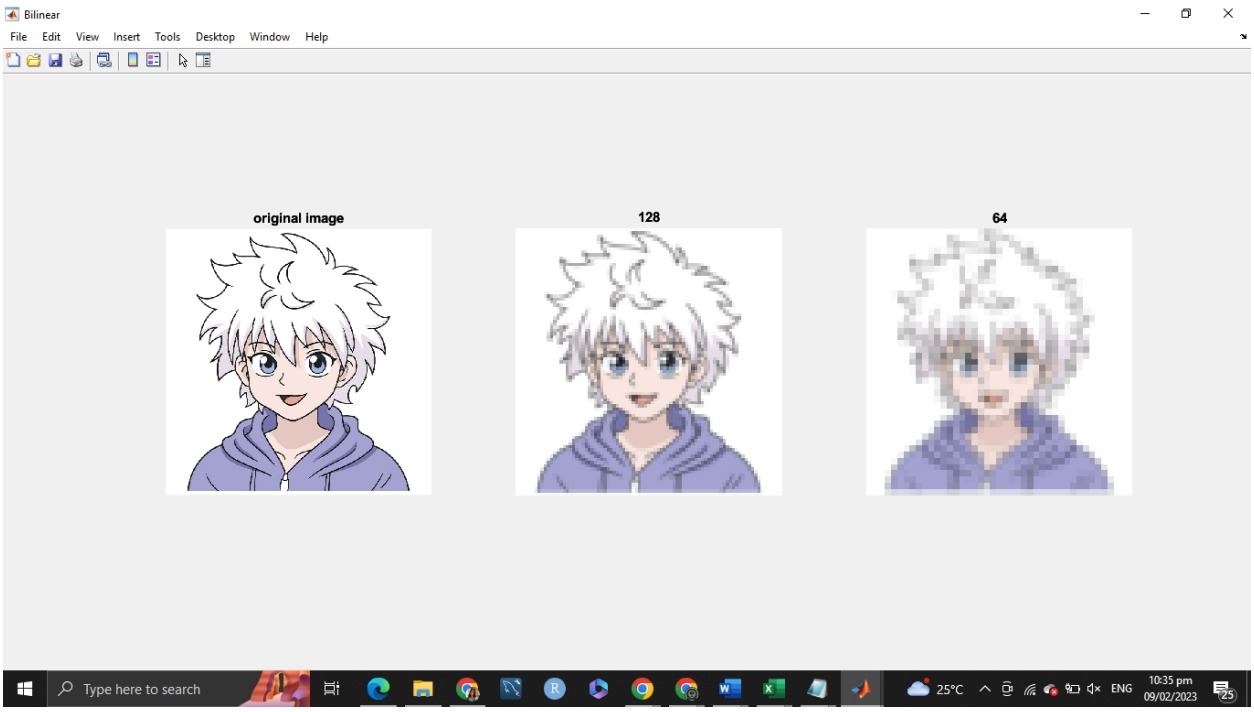
```
im = imread('self.jpg');
im1 = imresize(im, [863 863]);

% nearest neighbor
nn64 = imresize(im1, [863 863]/16, 'nearest');
nn128 = imresize(im1, [863 863]/8, 'nearest');

figure('Name', 'Nearest Neighbor', 'NumberTitle','off');
subplot(1, 3, 1); imshow(im1); title('original image');
subplot(1, 3, 2); imshow(nn128); title('128');
subplot(1, 3, 3); imshow(nn64); title('64');
```

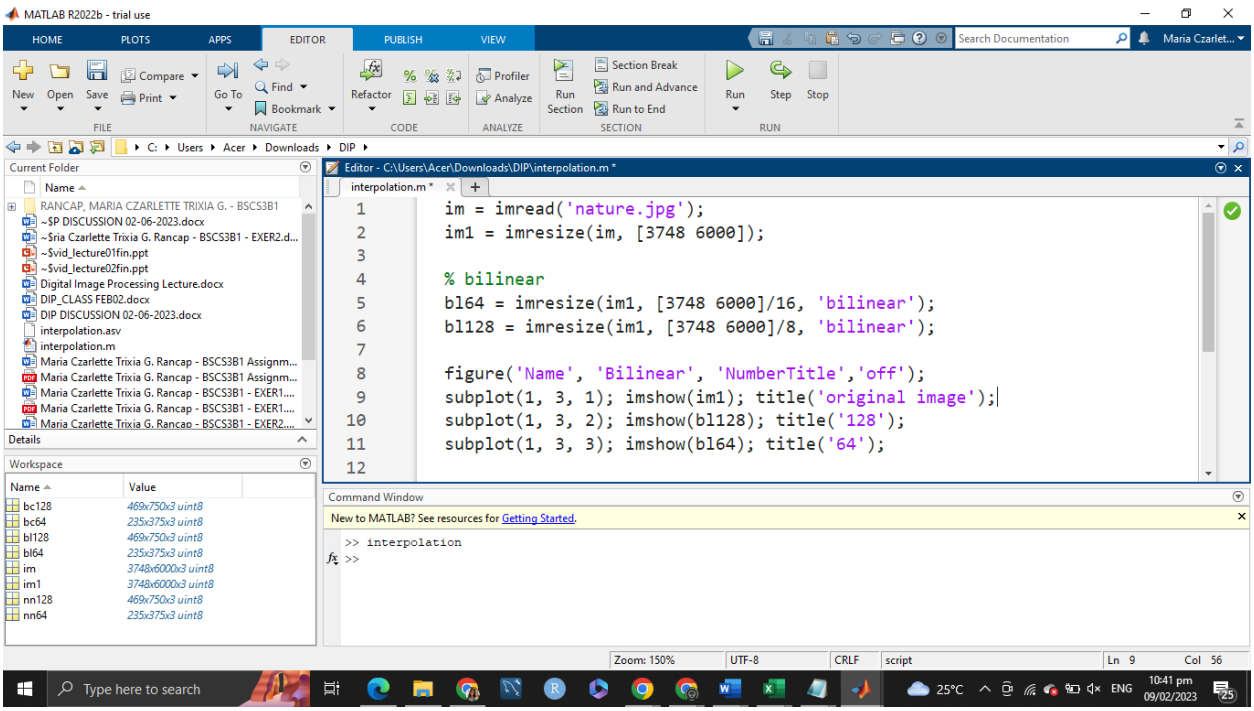
```
>> interpolation
>>
```

Nearest Neighbor

2. Bilinear Interpolation



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DIP_CLASS FEB02.docx
DIP DISCUSSION 02-06-2023.docx
interpolation.asv
interpolation.m
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Maria Czarlette Trixia G. Rancap - BSCS3B1 - EXER2....
Details
Workspace
Name
Value
bc128 469x750x3 uint8
bc64 235x375x3 uint8
bl128 469x750x3 uint8
bl64 235x375x3 uint8
im 3748x6000x3 uint8
im1 3748x6000x3 uint8
nn128 469x750x3 uint8
nn64 235x375x3 uint8
Editor - C:\Users\Acer\Downloads\DIP\interpolation.m *
interpolation.m *
1 im = imread('nature.jpg');
2 im1 = imresize(im, [3748 6000]);
3
4 % bilinear
5 bl64 = imresize(im1, [3748 6000]/16, 'bilinear');
6 bl128 = imresize(im1, [3748 6000]/8, 'bilinear');
7
8 figure('Name', 'Bilinear', 'NumberTitle','off');
9 subplot(1, 3, 1); imshow(im1); title('original image');
10 subplot(1, 3, 2); imshow(bl128); title('128');
11 subplot(1, 3, 3); imshow(bl64); title('64');
12
Command Window
New to MATLAB? See resources for Getting Started.
>> interpolation
>>
Zoom: 150%
UTF-8
CRLF
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Ln 9
Col 56
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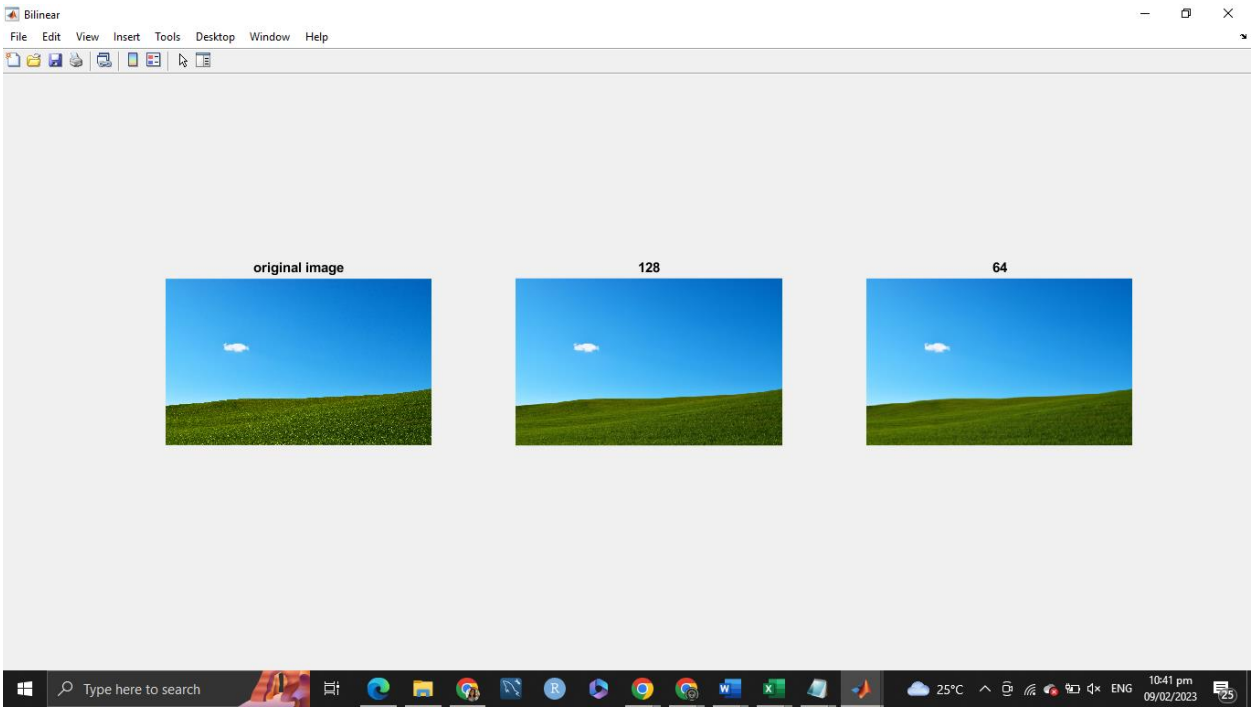
09/02/2023


Bilinear
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09/02/2023

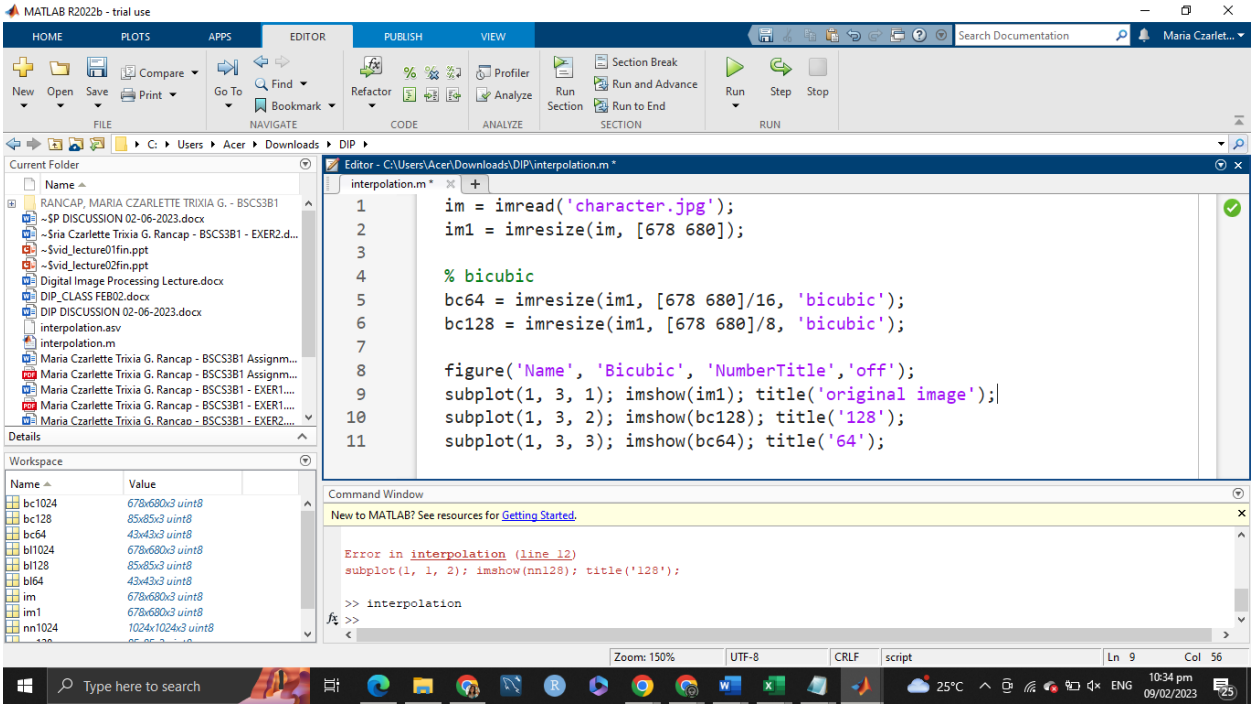
MATLAB R2022b - trial use

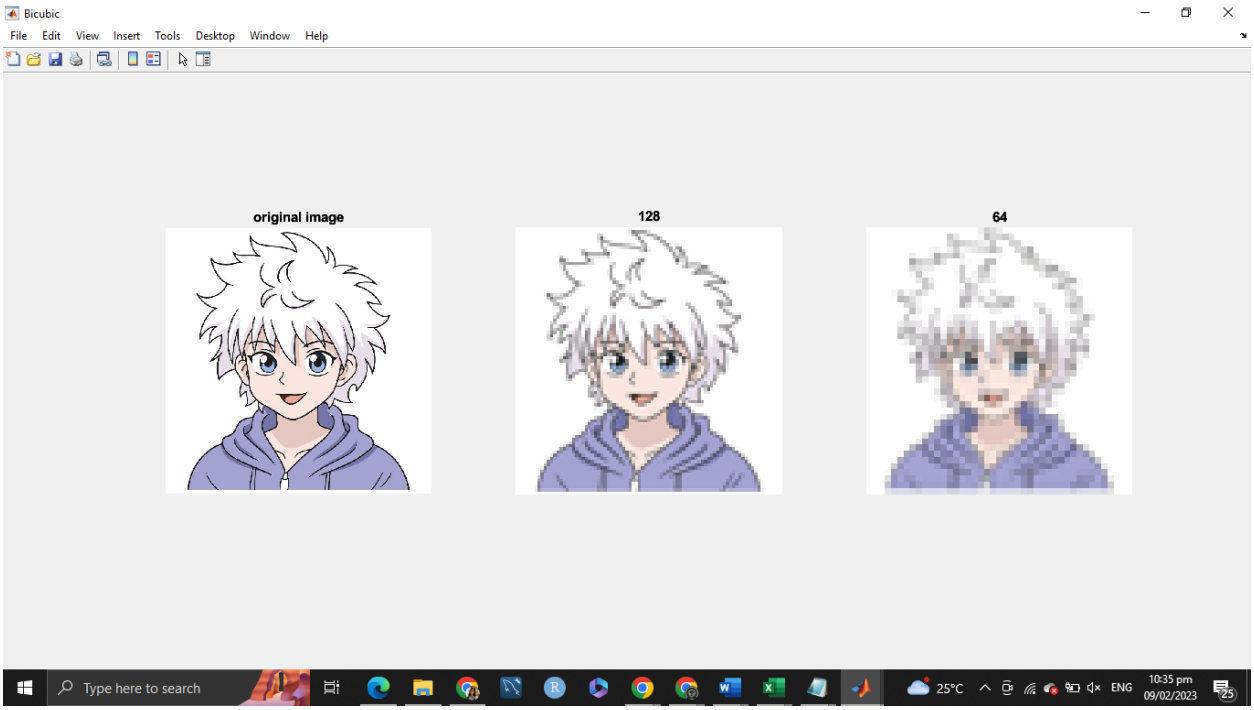
```
im = imread('self.jpg');
im1 = imresize(im, [863 863]);

% bilinear
bl64 = imresize(im1, [863 863]/16, 'bilinear');
bl128 = imresize(im1, [863 863]/8, 'bilinear');

figure('Name', 'Bilinear', 'NumberTitle','off');
subplot(1, 3, 1); imshow(im1); title('original image');
subplot(1, 3, 2); imshow(bl128); title('128');
subplot(1, 3, 3); imshow(bl64); title('64');
```

```
>> interpolation
>>
```

Bilinear

3. Bicubic Interpolation





MATLAB R2022b - trial use

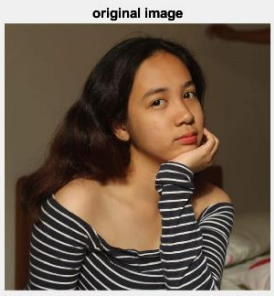
```
im = imread('nature.jpg');
im1 = imresize(im, [3748 6000]);

% bicubic
bc64 = imresize(im1, [3748 6000]/16, 'bicubic');
bc128 = imresize(im1, [3748 6000]/8, 'bicubic');

figure('Name', 'Bicubic', 'NumberTitle','off');
subplot(1, 3, 1); imshow(im1); title('original image');
subplot(1, 3, 2); imshow(bc128); title('128');
subplot(1, 3, 3); imshow(bc64); title('64');
```

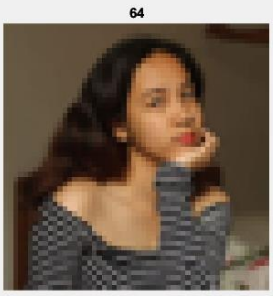
```
>> interpolation
>>
```

MATLAB R2022b - trial use

```
im = imread('self.jpg');
im1 = imresize(im, [863 863]);

% bicubic
bc64 = imresize(im1, [863 863]/16, 'bicubic');
bc128 = imresize(im1, [863 863]/8, 'bicubic');

figure('Name', 'Bicubic', 'NumberTitle','off');
subplot(1, 3, 1); imshow(im1); title('original image');
subplot(1, 3, 2); imshow(bc128); title('128');
subplot(1, 3, 3); imshow(bc64); title('64');
```

```
>> interpolation
>>
```





Interpolation displays the image with more pixels or adding more pixels on the original image depending on which interpolation method we use. The image will appear smoother if there are more pixels displayed. As we can see in nearest neighbor interpolation, because this method is faster than others and only assigns the value of the nearest pixel in the input image to the output image, it produces more blocky, pixelated images. In bilinear, we can see that it produces smoother results than nearest neighbor because it uses the average of the four closest pixels to calculate the value of the new pixel, resulting in more pixels. Lastly, the bicubic interpolation. Bicubic interpolation calculates the sixteen closest pixels in the input image, producing smoother results than bilinear and preserving more image details for it produces more pixel than the other interpolation methods.