

CS825-001, Spring/Summer 2020
Assignment 4- Part 1
Submitted to Dr. Xue Dong Yang
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Q1) input image car.raw

Output image – magnitude is computed from dft and then it will be scaled. Below image is the final scaled image.

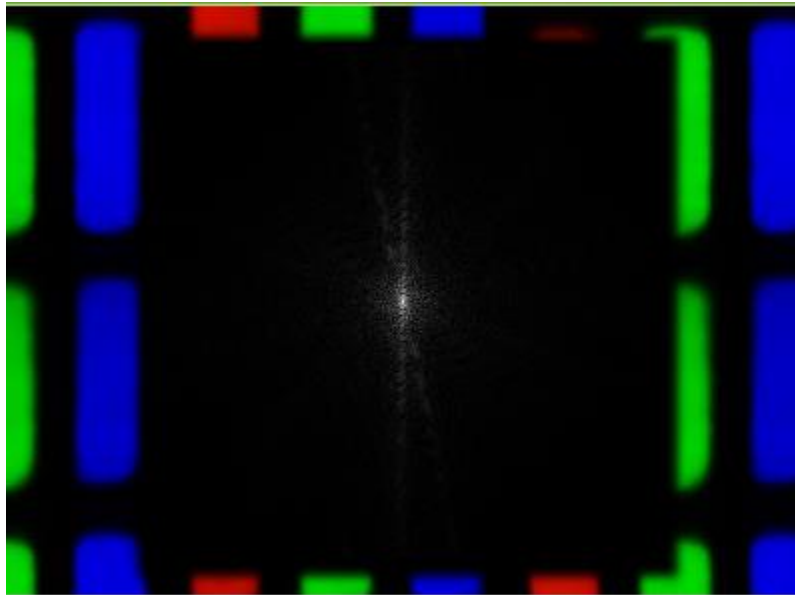


Fig 1- final scaled image after computing magnitude of dft of car image.

Screenshots of computation performed during the execution of program for the car input image

```
(base) C:\Users\Owner\Desktop\Image Processing\assignment 4>python part1.py "C:\Users\Owner\Desktop\Image Processing\assignment 4\input images\car.raw" 256 256 "C:\Users\Owner\Desktop\Image Processing\assignment 4\output images"

original image
[[195 196 189 ... 173 183 178]
 [180 190 191 ... 180 185 174]
 [173 178 178 ... 187 186 159]
 ...
 [ 35  33  36 ...  89  85  81]
 [ 35  38  42 ...  88  85  78]
 [ 35  38  38 ...  88  90  82]]

complex image-
[[ 195.+0.j -196.+0.j 189.+0.j ... -173.+0.j 183.+0.j -178.+0.j]
 [-180.+0.j 190.+0.j -191.+0.j ... 180.+0.j -185.+0.j 174.+0.j]
 [ 173.+0.j -178.+0.j 178.+0.j ... -187.+0.j 186.+0.j -159.+0.j]
 ...
 [-35.+0.j 33.+0.j -36.+0.j ... 89.+0.j -85.+0.j 81.+0.j]
 [ 35.+0.j -38.+0.j 42.+0.j ... -88.+0.j 85.+0.j -78.+0.j]
 [-35.+0.j 38.+0.j -38.+0.j ... 88.+0.j -90.+0.j 82.+0.j]]

dft-
[[ 6.34765625e-03+0.j 4.10463518e-03-0.00317044j
 8.30660653e-03-0.00760937j ... 1.61494179e-03-0.00349226j
 8.30660653e-03+0.00760937j 4.10463518e-03+0.00317044j]
 [ 3.49052299e-03+0.00165803j -4.17999456e-03-0.0031206j
 1.54700424e-03-0.00657368j ... 3.08099127e-03-0.00103597j
 -8.31909401e-04+0.0031085j -6.07854557e-04-0.00030355j]
 [ 5.34636217e-03-0.00476163j -2.95409949e-03-0.00374031j
 4.07602775e-03-0.00418056j ... -4.67005753e-06-0.00578146j
 3.65569746e-03+0.00190576j 4.64127131e-04-0.00294768j]
 ...
 [ 7.35332300e-03+0.00134421j -7.96318365e-04+0.00200256j
 3.18572887e-03-0.00431925j ... -5.95257542e-03-0.00729067j
 4.63999293e-03-0.00609872j 4.20562183e-03+0.00579222j]
 [ 5.34636217e-03+0.00476163j 4.64127131e-04+0.00294768j
 3.65569746e-03-0.00190576j ... -3.48943018e-03+0.00416798j
 4.07602775e-03+0.00418056j -2.95409949e-03+0.00374031j]
 [ 3.49052299e-03-0.00165803j -6.07854557e-04+0.00030355j
 -8.31909401e-04-0.0031085j ... -9.05479635e-04-0.00608212j]]
```

Fig 2- computation performed with the input car image

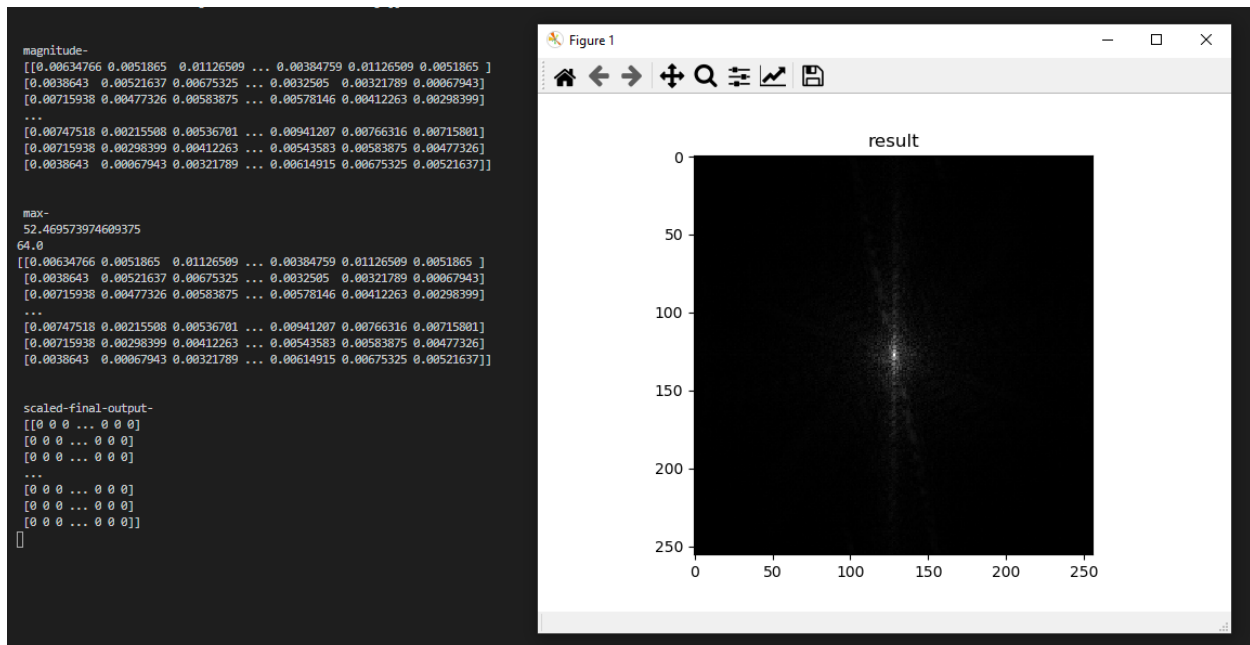


Fig 3- computation performed with the input car image

Q1) input image square256.raw

Output image- magnitude is computed from dft and then it will be scaled. Below image is the final scaled image.

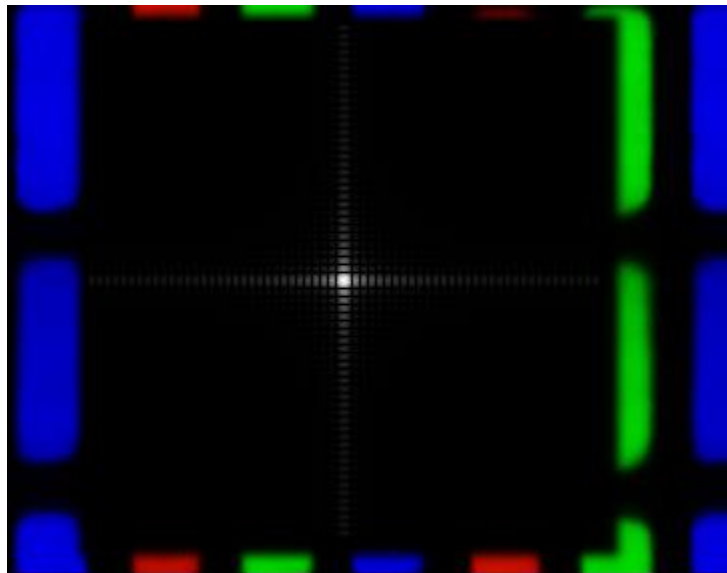


Fig 4- final scaled image after computing magnitude of dft of square image

Screenshots of computation performed during the execution of program for the square input image

```
(base) C:\Users\Owner\Desktop\Image Processing\assignment 4\python part1.py "C:\Users\Owner\Desktop\Image Processing\assignment 4\input_images\square256.raw" 256 256 "C:\Users\Owner\Desktop\Image Processing\assignment 4\output_images"

original image
[[0 0 ... 0 0]
 [0 0 ... 0 0]
 [0 0 ... 0 0]
 ...
 [0 0 ... 0 0]
 [0 0 ... 0 0]
 [0 0 ... 0 0]]

complex image
[[ 0.+0.j -0.+0.j 0.+0.j ... -0.+0.j 0.+0.j -0.+0.j]
 [-0.+0.j 0.+0.j -0.+0.j ... 0.+0.j -0.+0.j 0.+0.j]
 [ 0.+0.j -0.+0.j 0.+0.j ... -0.+0.j 0.+0.j -0.+0.j]
 ...
 [-0.+0.j 0.+0.j -0.+0.j ... 0.+0.j -0.+0.j 0.+0.j]
 [ 0.+0.j -0.+0.j 0.+0.j ... -0.+0.j 0.+0.j -0.+0.j]
 [-0.+0.j 0.+0.j -0.+0.j ... 0.+0.j -0.+0.j 0.+0.j]]

dft-
[[ 0. +0.00000000e+00j 0. +0.00000000e+00j
  0. +0.00000000e+00j ... 0. +0.00000000e+00j
  0. +0.00000000e+00j 0. +0.00000000e+00j]
 [ 0. +0.00000000e+00j -0.0019452 -4.77220433e-05j
  0.00275052+1.01307553e-04j ... 0.00194638-4.7788246e-05j
 -0.00275218+3.37759663e-05j 0.00194579+0.00000000e+00j]
 [ 0. +0.00000000e+00j 0.00275052+1.01307553e-04j
 -0.00388865-1.91836946e-04j ... -0.00275383+3.37963239e-05j
 0.00389334+0.00000000e+00j -0.00275218-3.37759663e-05j]
 ...
 [ 0. +0.00000000e+00j 0.00194638-4.7788246e-05j
 -0.00275383+3.37963239e-05j ... -0.00194286+1.43313693e-04j
 0.00274886-1.68879844e-04j 0.00194602+0.55328079e-05j]
 [ 0. +0.00000000e+00j -0.00275218+3.37759663e-05j
 0.00389334+0.00000000e+00j ... 0.00274886-1.68879844e-04j
 -0.00388865+1.91836946e-04j 0.00275052-1.01307553e-04j]
 [ 0. +0.00000000e+00j 0.00194579+0.00000000e+00j
 -0.00275218-3.37759663e-05j ... -0.00194402+0.55328079e-05j
 0.00275052-1.01307553e-04j -0.0019452 +4.77220433e-05j]]
```

Fig 5- computation performed with the input square image

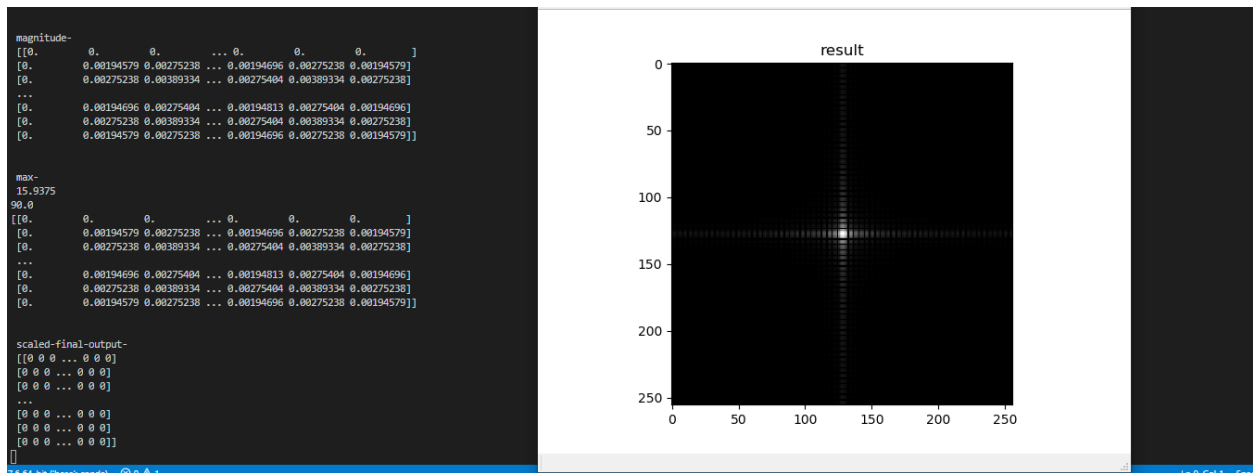


Fig 6- computation performed with the input square image