

BLG202E – ASSIGNMENT2

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Q4)

b)

The “r” iterations are starting from 2 and goes to 64. As we expect, when $r = 2$, the image has lower quality and when $r = 64$, the image has more quality. When we increase rank, the quality of images and the needed storage increase. The needed storage can be write as a function of “r” $\Rightarrow (1+m+n)*r$.

$m*r$ comes from U matrix

$n*r$ comes from V matrix

$r*1$ comes from S matrix

For original picture, we can say that the needed storage is the dimension of the original image which is $320*200 = 64\text{kb}$.

Note: $m = 200$, $n = 320$ for all ranks.

Original image	shapes of (U,S,V):	(200, 200)	(200, 200)	(320, 320)
Rank = 2 image	shapes of (U,S,V):	(200, 2)	(2, 2)	(2, 320)
Rank = 4 image	shapes of (U,S,V):	(200, 4)	(4, 4)	(4, 320)
Rank = 8 image	shapes of (U,S,V):	(200, 8)	(8, 8)	(8, 320)
Rank = 16 image	shapes of (U,S,V):	(200, 16)	(16, 16)	(16, 320)
Rank = 32 image	shapes of (U,S,V):	(200, 32)	(32, 32)	(32, 320)
Rank = 64 image	shapes of (U,S,V):	(200, 64)	(64, 64)	(64, 320)

Comment for images:

Rank 2: The image has some colors but the figures are not good.

Rank 4: Some shapes are appeared. As face and nose.

Rank 8: More good than rank 4. And more shapes are appered. Also we can understand that the figure has a clown.

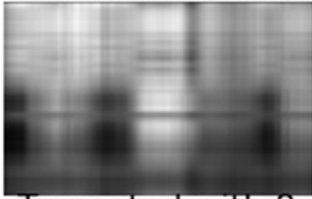
Rank 16: The image can be understand very clearly but the quality is low.

Rank 32: Quality is increased.

Rank 64: Image quality approaches to the original image but not good as original image.

Image Output of the Code:

Truncated with 2



Truncated with 8



Truncated with 32



Truncated with 4



Truncated with 16



Truncated with 64

