ITE4052 Computer Vision

**Programming Assignment1**

**2020095178 최윤선**

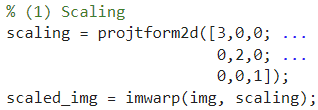
1. **Projective Image Transformation**

‘projective2d’는 현재 matlab 버전에서 권장되지 않는다고 하여 ‘projtform2d’를 사용함.

**<peppers.png>**



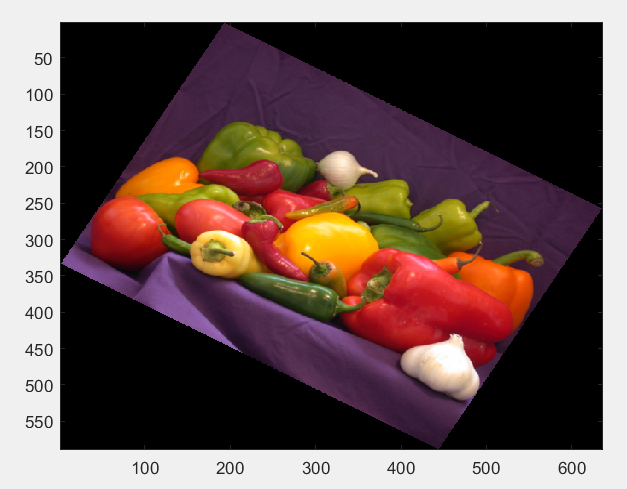
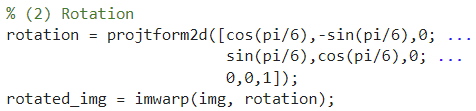
1. **Scaling**



Matrix:

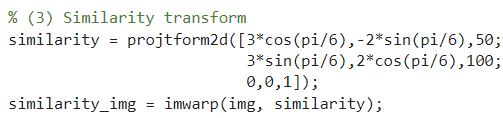
x축으로 3배, y축으로 2배 scaling

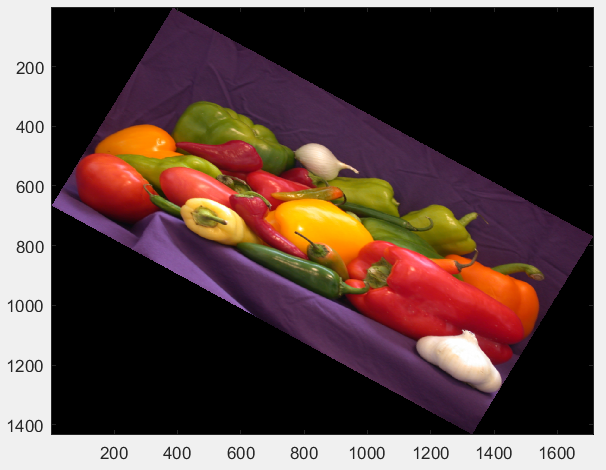
1. **Rotation**



Matrix:

30 rotation

1. **Similarity transformation**



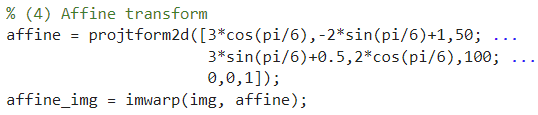
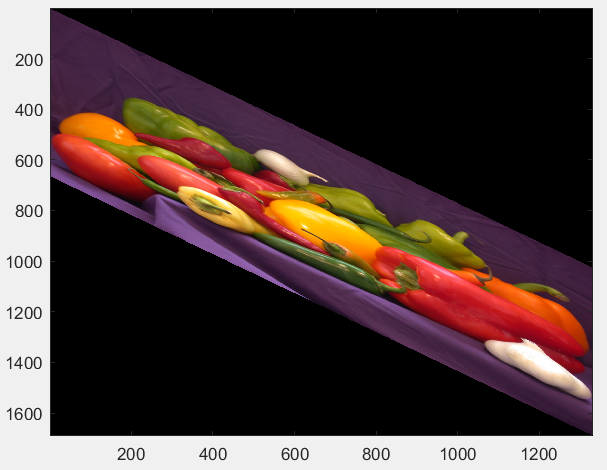
Matrix:

x축으로 3배, y축으로 2배 scaling

30 rotation

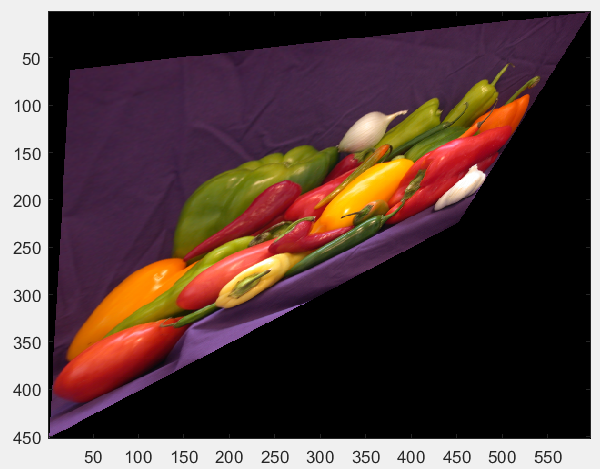
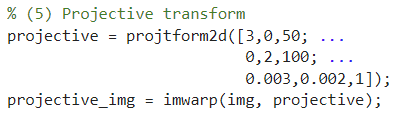
x축으로 50, y축으로 100만큼 좌표 이동

1. **Affine transformation**

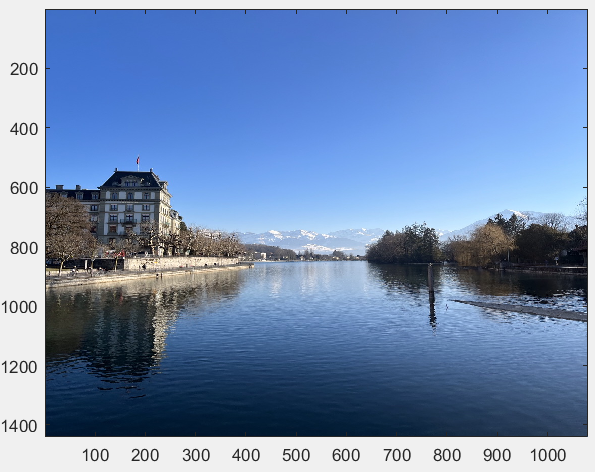
Matrix:

1. **Projective transformation**

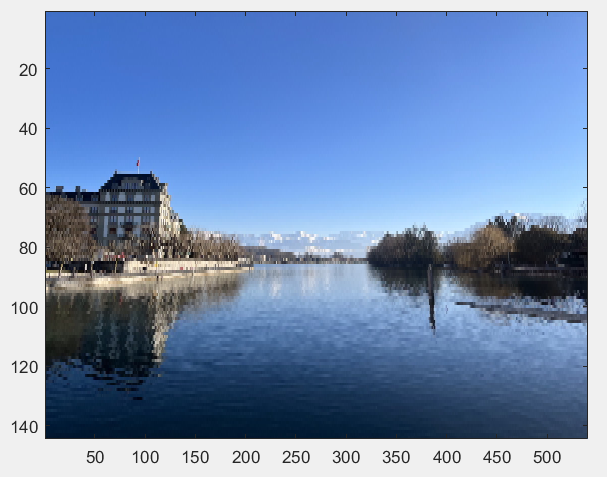
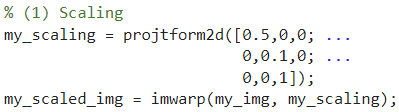


Matrix:

**<my own image>**



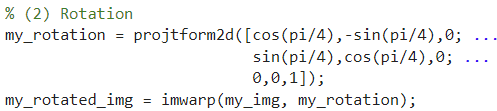
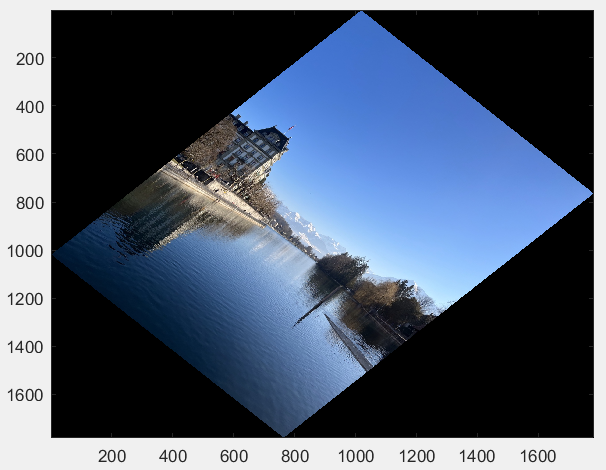
1. **Scaling**



Matrix:

x축으로 0.5배, y축으로 0.1배 scaling

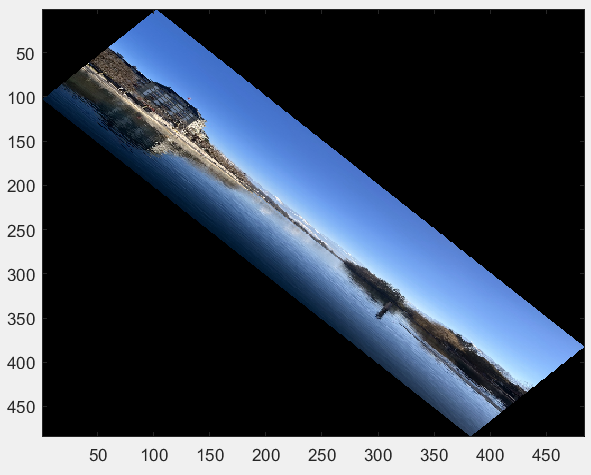
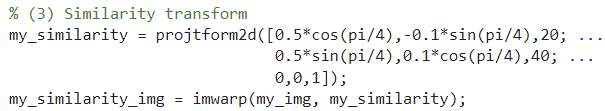
1. **Rotation**

Matrix:

45 rotation

1. **Similarity transformation**

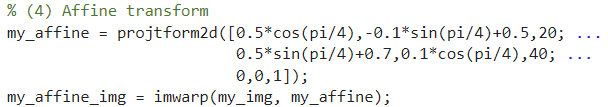


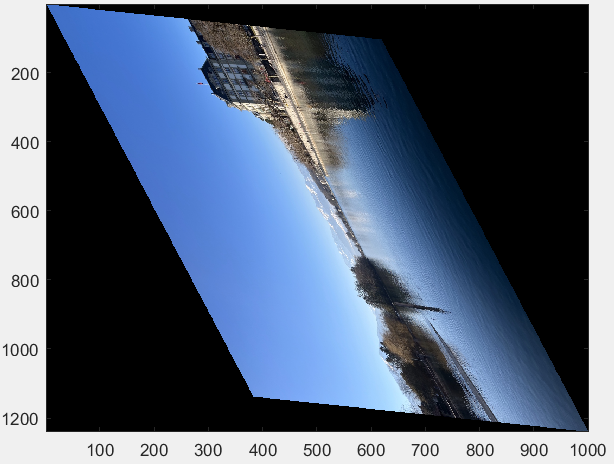
Matrix:

x축으로 0.5배, y축으로 0.1배 scaling

45 rotation

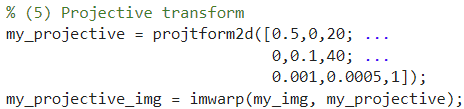
x축으로 20, y축으로 40만큼 좌표 이동

1. **Affine transformation**



Matrix:

1. **Projective transformation**

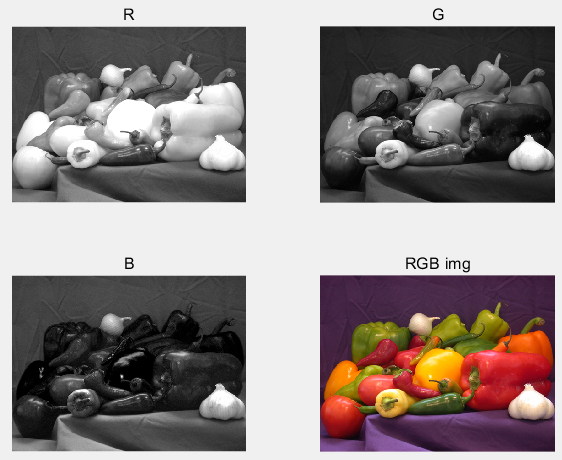
 

Matrix:

1. **Color Space**

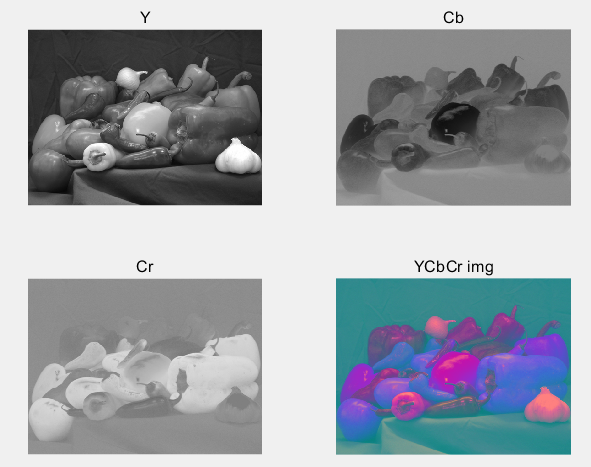
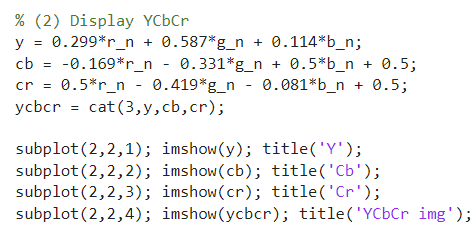
**<pepper.png>**

1. **RGB**



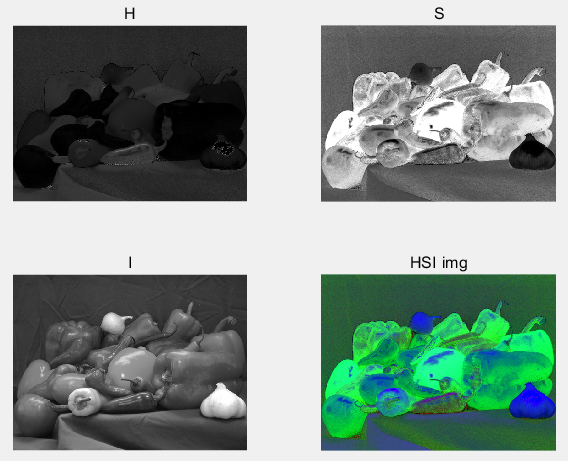
img에서 R, G, B값을 각각 추출하여 RGB components를 나타내었다.

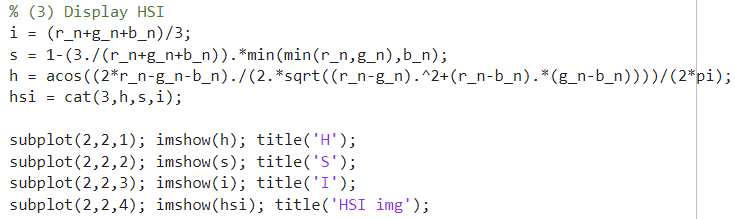
1. **YCbCr**



RGB를 YCbCr 공간으로 바꿔주는 행렬을 사용하였고, 이때 RGB값을 0~1 사이의 값으로 normalize한 후 계산하였다.

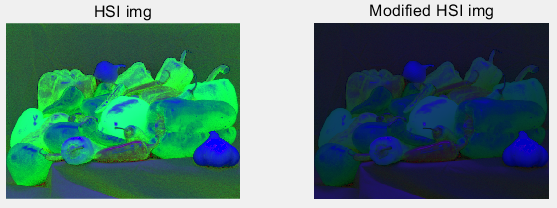
1. **HSI**





RGB값을 HSI 공간으로 바꿔 주는 공식을 사용하였고, 이때 RGB값을 0~1 사이의 값으로 normalize한 후 계산하였다.

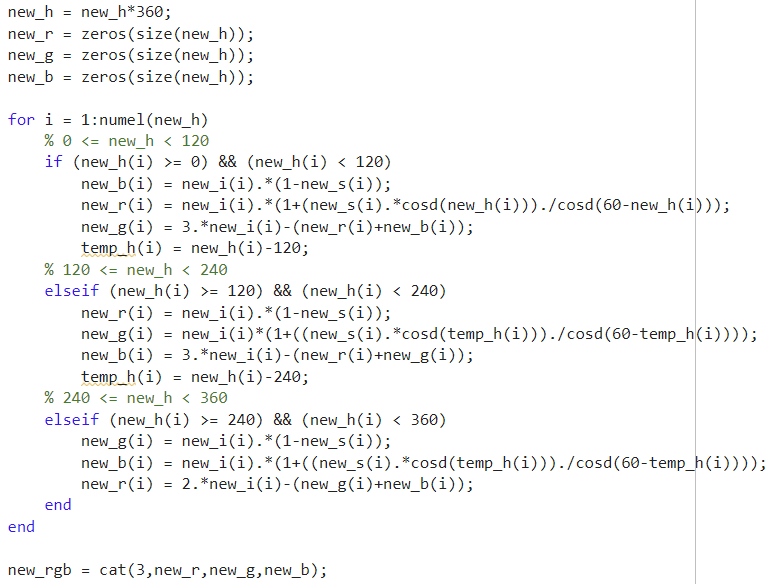
1. **Modified RGB**





HSI공간에서 우선 Hue를 0.5배, Saturation을 0.25배, Intensity를 0.75배로 조정하였다.



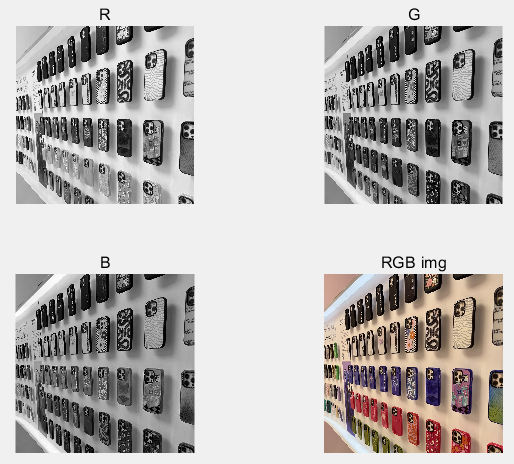


조정한 H, S, I값을 new\_h, new\_s, new\_i로 새로 정의한 후, HSI 공간을 RGB 공간으로 바꾸어 주는 공식을 사용하였다. Hue 값이 [0, 120), [120, 240), [240, 360)인 구간에 따라 새로운 r, g, b 값을 구하는 방법이 달라, if문을 사용하여 코드를 작성하였다.

**<my own image>**



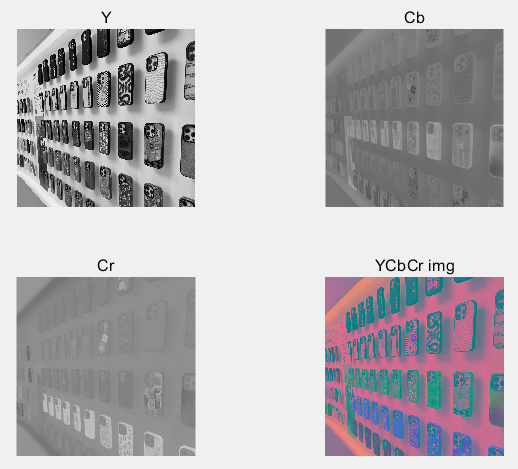
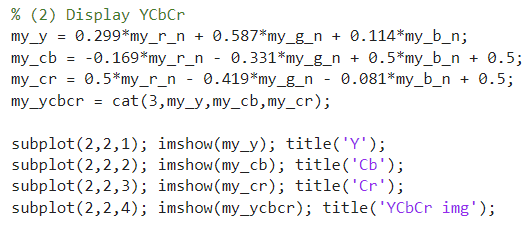
1. **RGB**





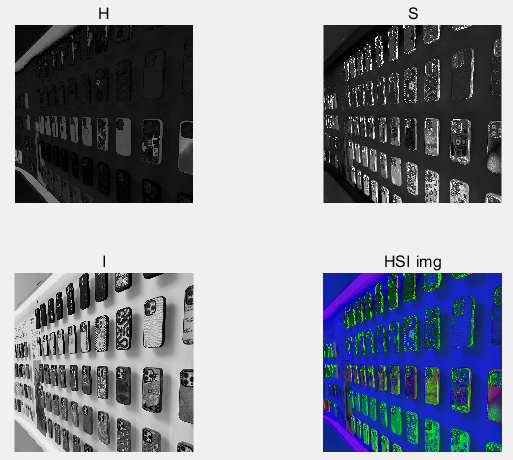
my\_img에서 R, G, B값을 각각 추출하여 RGB components를 나타내었다.

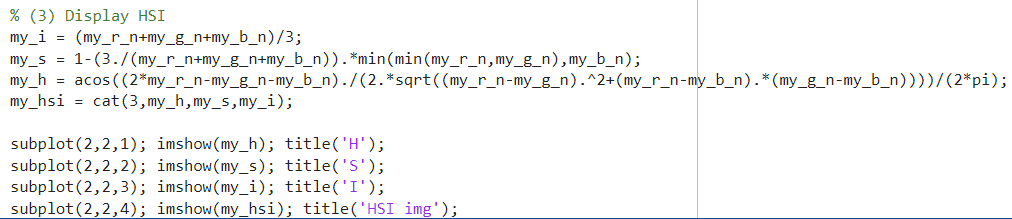
1. **YCbCr**



RGB를 YCbCr 공간으로 바꿔주는 행렬을 사용하였고, 이때 RGB값을 0~1 사이의 값으로 normalize한 후 계산하였다.

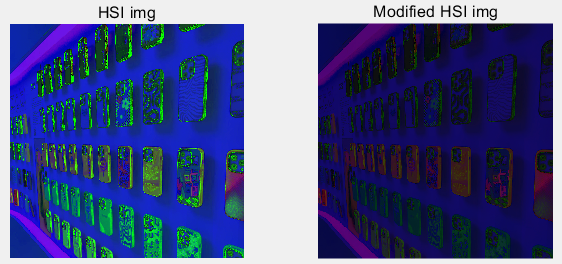
1. **HSI**

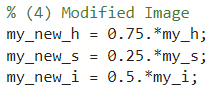




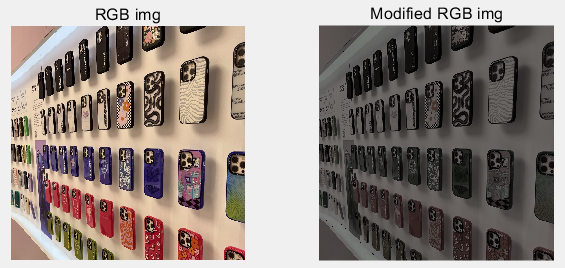
RGB값을 HSI 공간으로 바꿔 주는 공식을 사용하였고, 이때 RGB값을 0~1 사이의 값으로 normalize한 후 계산하였다.

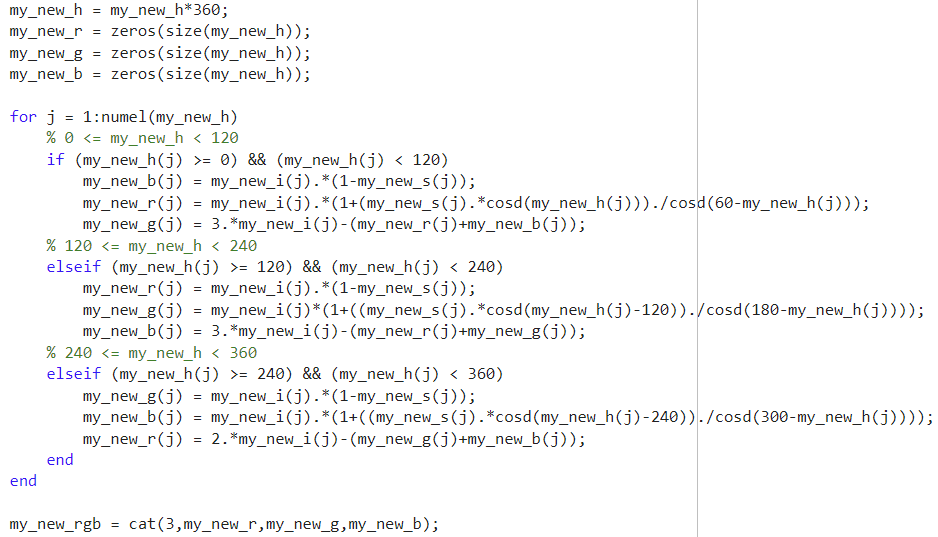
1. **Modified RGB**





HSI공간에서 우선 Hue를 0.75배, Saturation을 0.25배, Intensity를 0.5배로 조정하였다.





조정한 H, S, I값을 my\_new\_h, my\_new\_s, my\_new\_i로 새로 정의한 후, HSI 공간을 RGB 공간으로 바꾸어 주는 공식을 사용하였다. Hue 값이 [0, 120), [120, 240), [240, 360)인 구간에 따라 새로운 r, g, b 값을 구하는 방법이 달라, if문을 사용하여 코드를 작성하였다.