**Hypotheses and Attempts 1:**

**The effect of changing the value of YUV on same image**

1. U = 1, V = 1, change Y

I want to change the value of the YUV value to see what effect it has on the image.

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| --- | --- |
| **Value:**  Y = 1, U = 1, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 1 1 256  **Result:**  The image doesn't change | A picture containing text, person  Description automatically generated |
| **Value:**  Y = 3, U = 1, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 3 1 1 256  **Result:**  The picture on the right is getting a little blurry | A picture containing text, person  Description automatically generated |
| **Value:**  Y = 6, U = 1, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 6 1 1 256  **Result:**  The image on the right has become more blurred and the pixel lattice is clearly visible | A picture containing text, person  Description automatically generated |
| **Value:**  Y = 15, U = 1, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 15 1 1 256  **Result:**  It's a little hard to tell what's on the picture on the right, very blurry | A picture containing text, person  Description automatically generated |

1. Y = 1, V = 1, change U

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| --- | --- |
| **Value:**  Y = 1, U = 3, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 3 1 256  **Result:**  There is no obvious change | A picture containing text, person  Description automatically generated |
| **Value:**  Y = 1, U = 6, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 6 1 256  **Result:**  There is no obvious change |  |
| **Value:**  Y = 1, U = 15, V = 1  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 15 1 256  **Result:**  The brightness of the picture has gone up | A picture containing text, person  Description automatically generated |

1. Y = 1, U = 1, change V

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| --- | --- |
| **Value:**  Y = 1, U = 1, V = 3  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 1 3 256  **Result:**  The brightness of the picture has gone up | A picture containing text, person  Description automatically generated |
| **Value:**  Y = 1, U = 1, V = 6  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 1 6 256  **Result:**  The picture is getting slightly blurry | A picture containing text, person  Description automatically generated |
| **Value:**  Y = 1, U = 1, V = 15  **Command Line:**  java MyImageDisplay.java Image3.rgb 1 1 15 256  **Result:**  The picture is getting slightly blurry | A picture containing text, person  Description automatically generated |

**Conclusion:**

We keep U, V as a constant equal to 1. When Y increase, the picture became more and more blurred.

When we keep Y, V as a constant equal to 1 and increase the value of U, there is no obvious change in the picture.

When we keep Y, U as a constant equal to 1 and increase the value of V, there is no significant change in sharpness except for a slight brightening of the image.

Thus, draw a conclusion, Y has the greatest impact on the sharpness of the image, so we can maintain the sharpness of the image by fixing the value of Y.

**Hypotheses and Attempts 2:**

**According to analysis 1, we get the value of U and V has almost no effect on images. Then I want to know are there any effects of changing the value of U and V on different image.**

1. **Set V = 500, Y = 1, U =1**

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| --- | --- |
| **Command Line:**  java MyImageDisplay.java Image1.rgb 1 1 500 256 | A couple of people posing for the camera  Description automatically generated with low confidence |
| **Command Line:**  java MyImageDisplay.java Image2.rgb 1 1 500 256 | A person playing golf  Description automatically generated with low confidence |
| **Command Line:**  java MyImageDisplay.java Image3.rgb 1 1 500 256 |  |
| **Command Line:**  java MyImageDisplay.java Image4.rgb 1 1 500 256 | A picture containing text, tree, outdoor  Description automatically generated |

A piece of my mind: When we change the value of V, the picture is brighter, the contrast between light and shade is higher, and it's a little clearer.

1. **Set U = 200, Y = 1, V = 1**

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| --- | --- |
| **Command Line:**  java MyImageDisplay.java Image1.rgb 1 200 1 256 | A picture containing person, little, child, smiling  Description automatically generated |
| **Command Line:**  java MyImageDisplay.java Image2.rgb 1 200 1 256 |  |
| **Command Line:**  java MyImageDisplay.java Image3.rgb 1 200 1 256 | A picture containing text, person, underpants  Description automatically generated |
| **Command Line:**  java MyImageDisplay.java Image4.rgb 1 200 1 256 | A picture containing text, tree, outdoor  Description automatically generated |

A piece of my mind: When we change the value of U, the image brightens very noticeably, and the brightness varies a lot.

**Conclusion: U has a great effect on the brightness of the image. As the value of U increases, the image also becomes a lot brighter. The V effect on the image is not so great, with only slight changes.**