Homework title：**Hw3_Color image enhancement**
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Data due：6/13
Data handed in：6/13

Technical description

在RGB model，分別對三個顏色R,G,B做histogram equalization來達成enhancement後，將三個顏色histogram equalization的結果，透過cat function來合併到一個matrix裡，此matrix即為RGB histogram equalization的結果。

在HSI的model下對color image做enhancement，在色相(hue)不變的情況下，採取對飽和度(saturation)乘上任意factor，而HSV與HSI model相似，在HSV下enhancement後，從HSV model轉換回RGB model輸出。

在lab space，透過對L座標的histogram equalization，來對圖形的lightness做enhancement，達到不改變hue的條件，先將L的值除100將範圍鎖定在0~1之間，接著透過function adapthisteq對其做histogram equalization，最後將L乘上100，把原先值被鎖定的範圍還原。

Experimental results

In RGB model

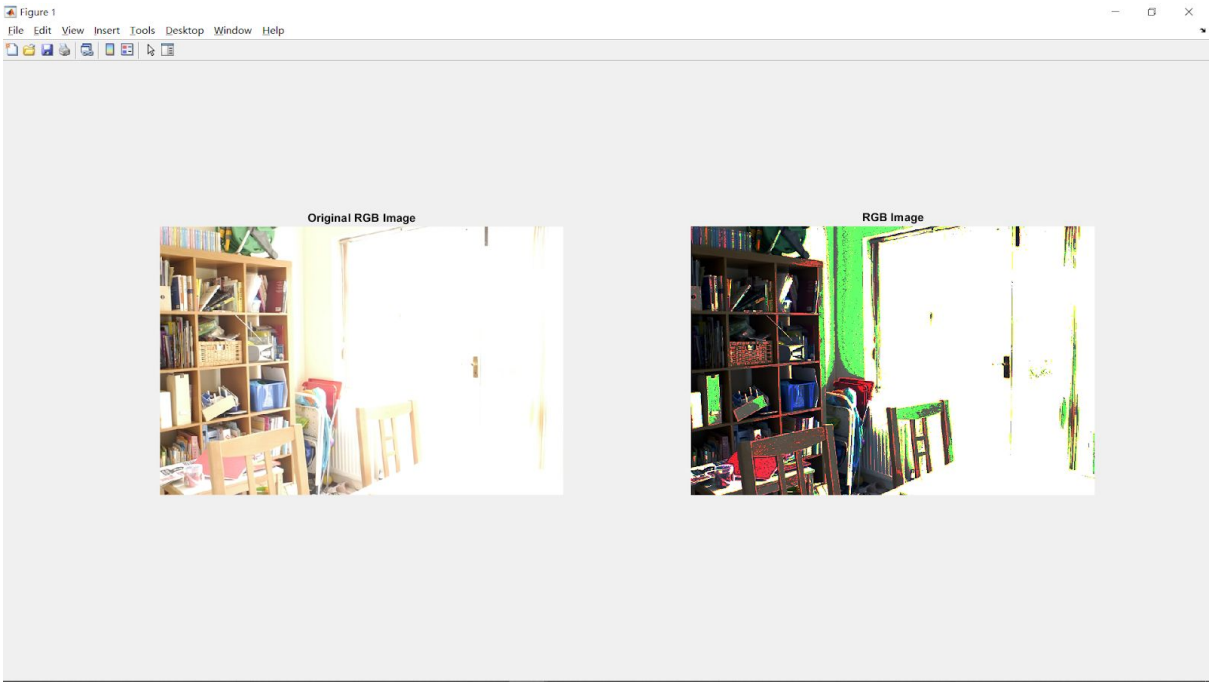


Figure 2

File Edit View Insert Tools Desktop Window Help

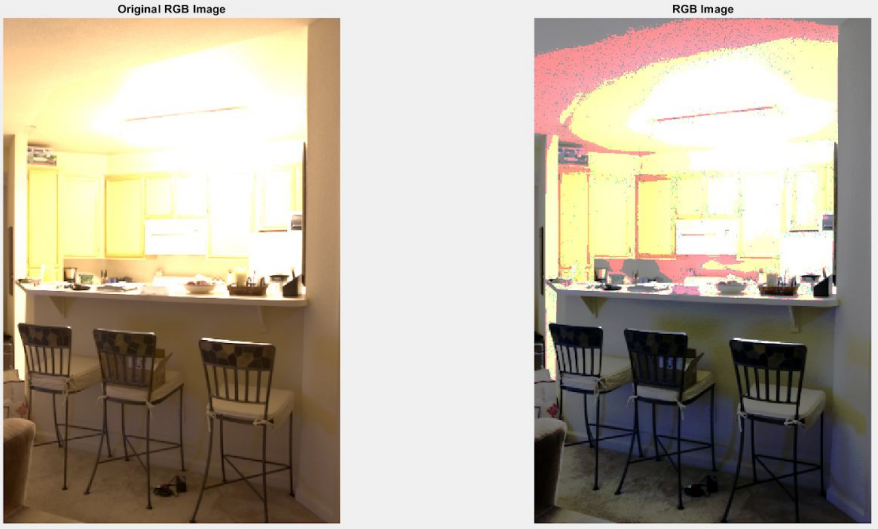
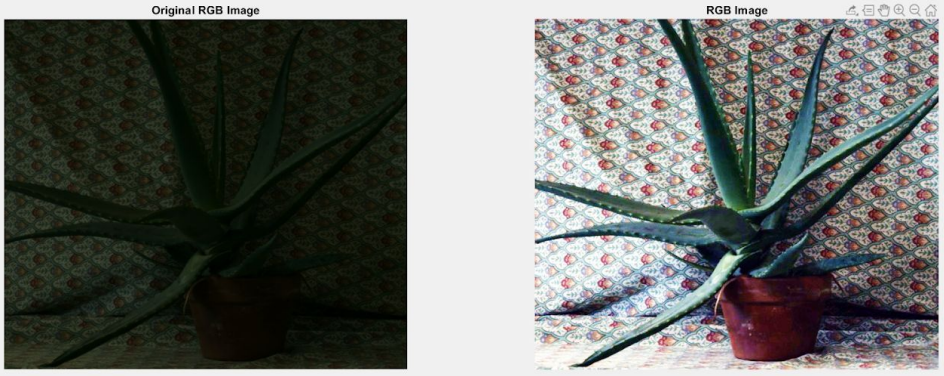
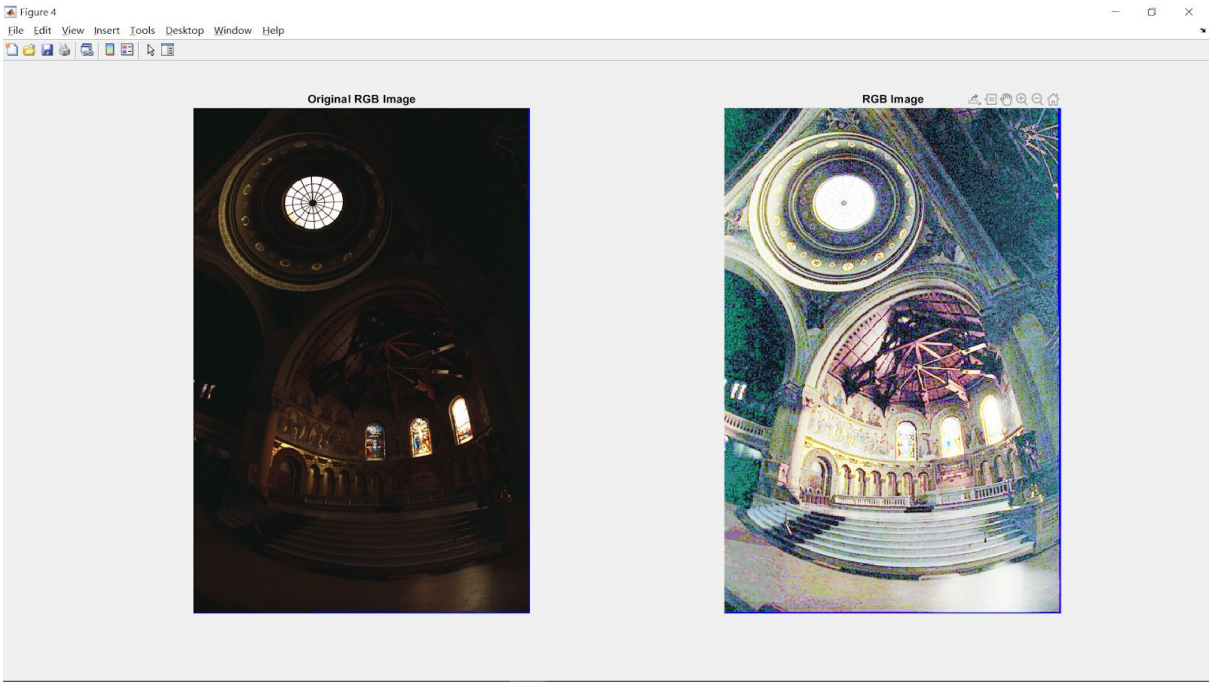


Figure 3

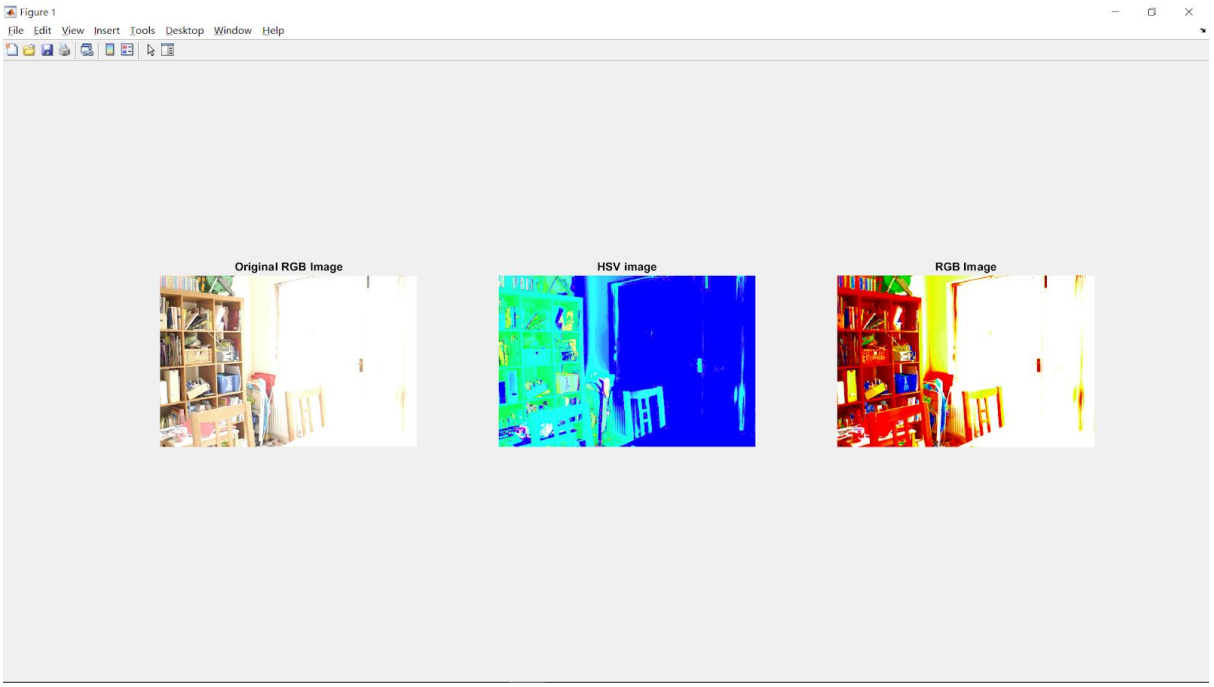
File Edit View Insert Tools Desktop Window Help





In HSI model

m=10.



m=20

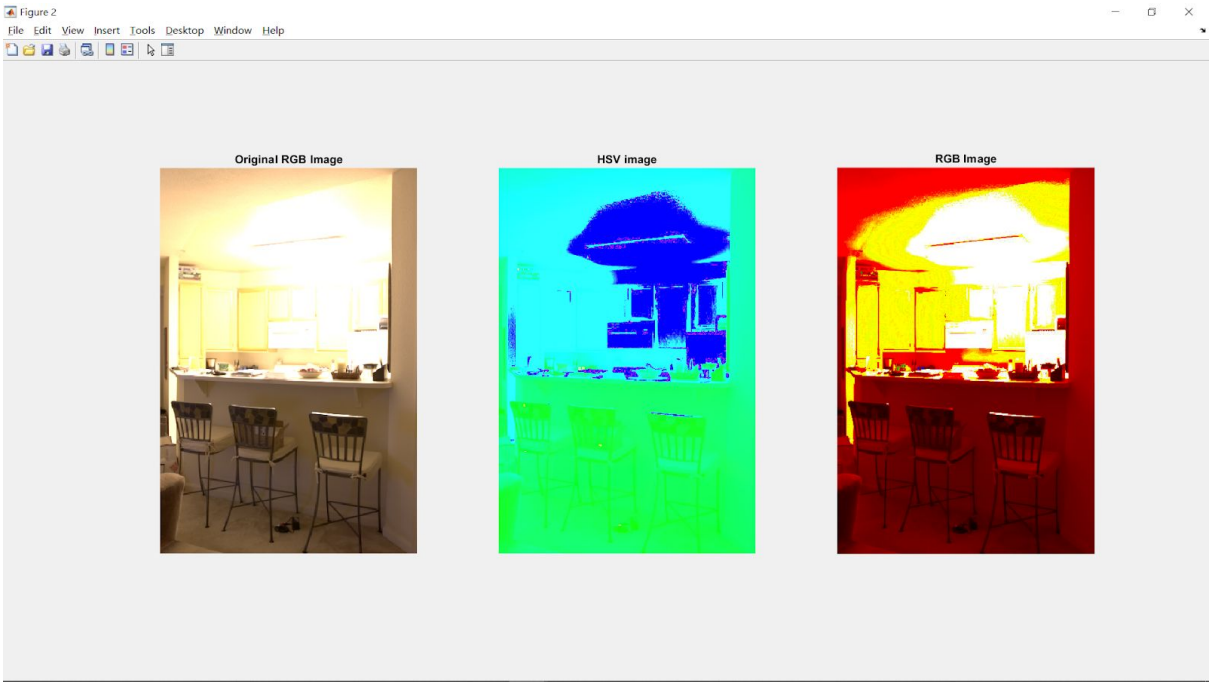


Figure 2
File Edit View Insert Tools Desktop Window Help
Original RGB Image
HSV image
RGB Image

m=7

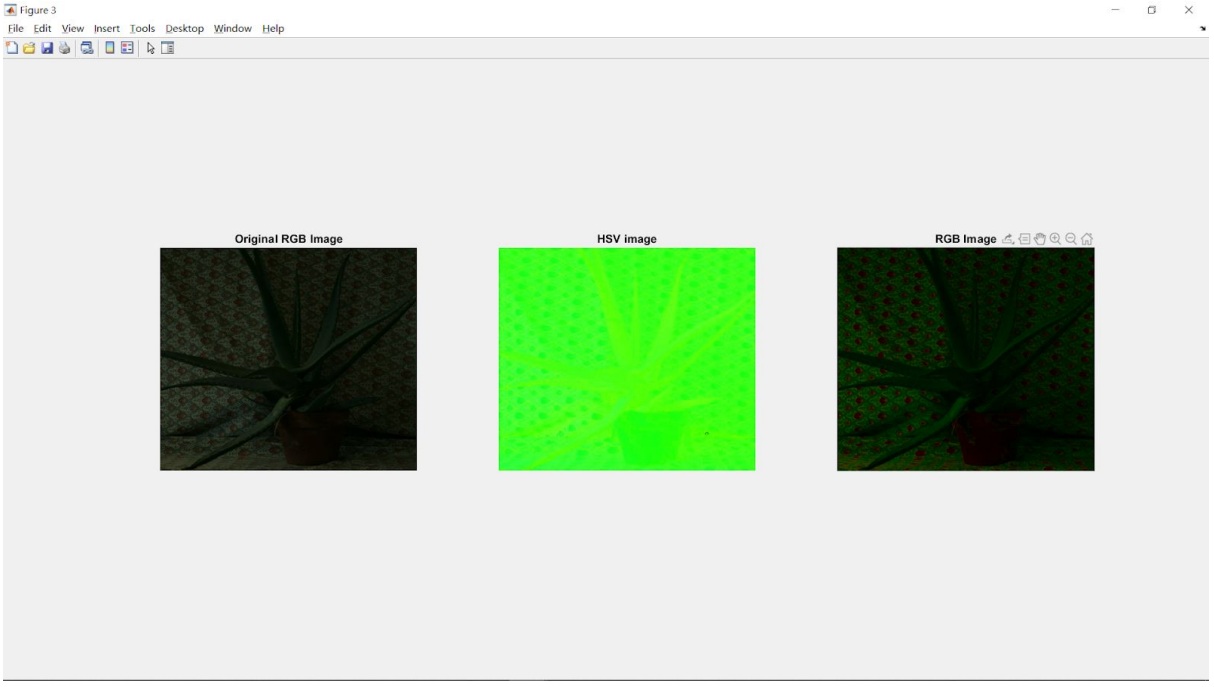
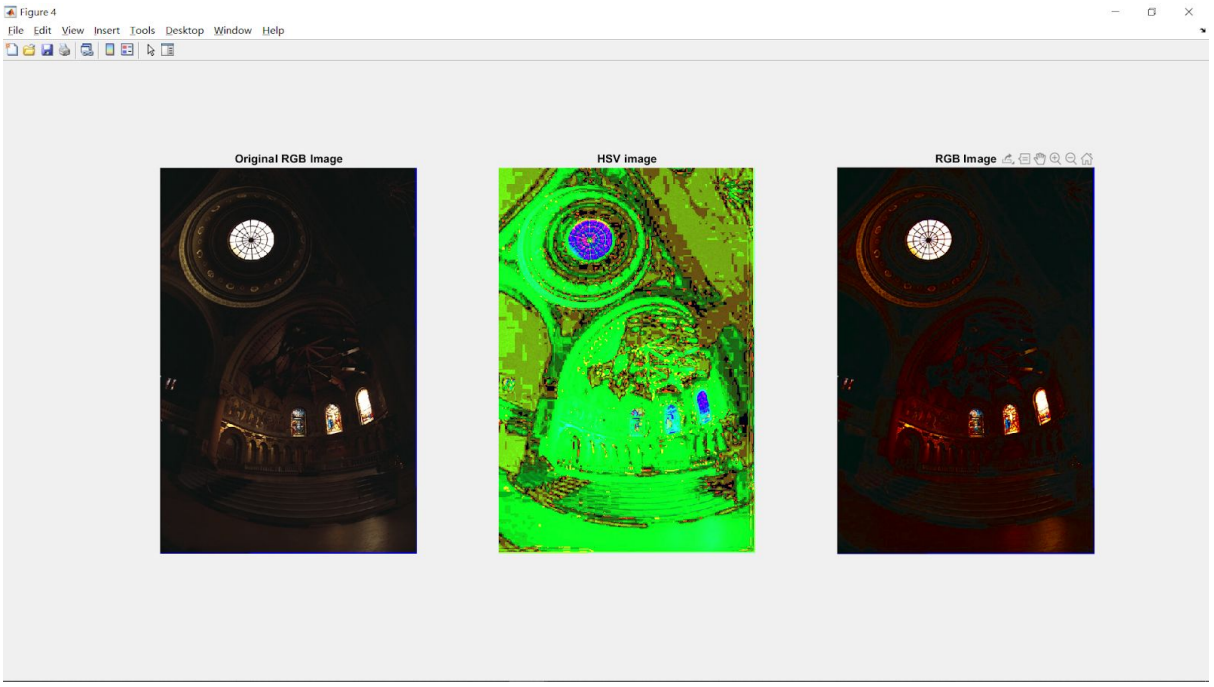


Figure 3
File Edit View Insert Tools Desktop Window Help
Original RGB Image
HSV image
RGB Image

m=3



In lab color model

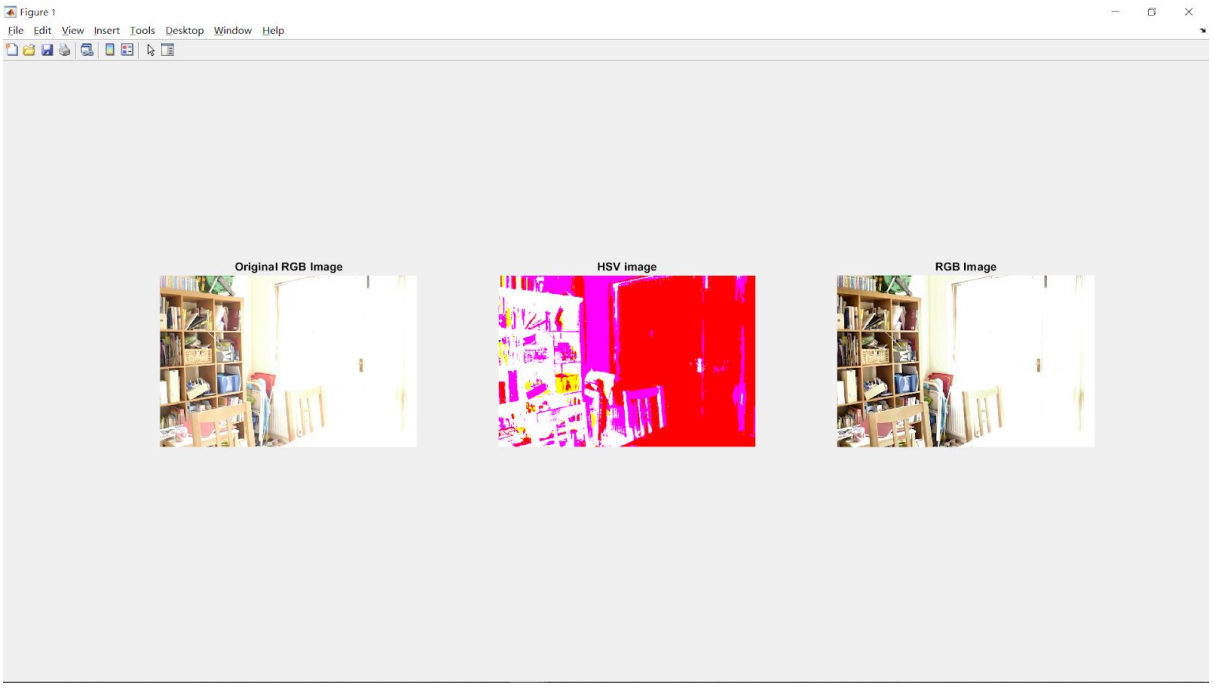


Figure 2

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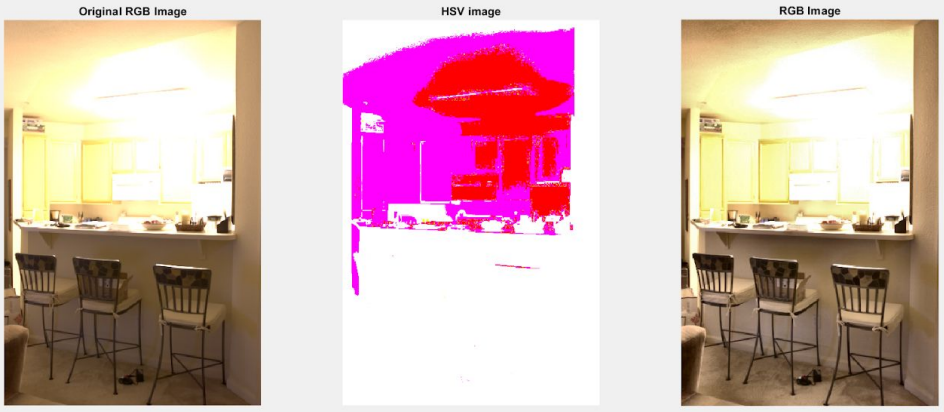

Figure 3

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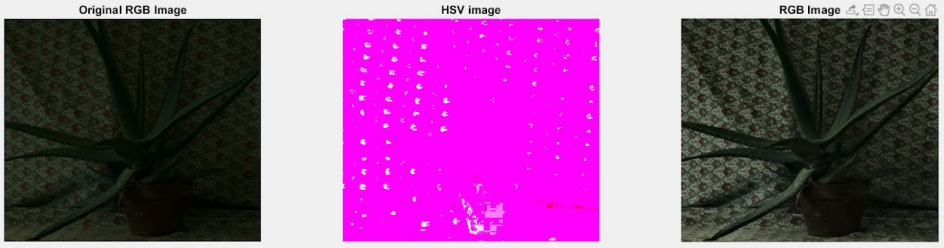

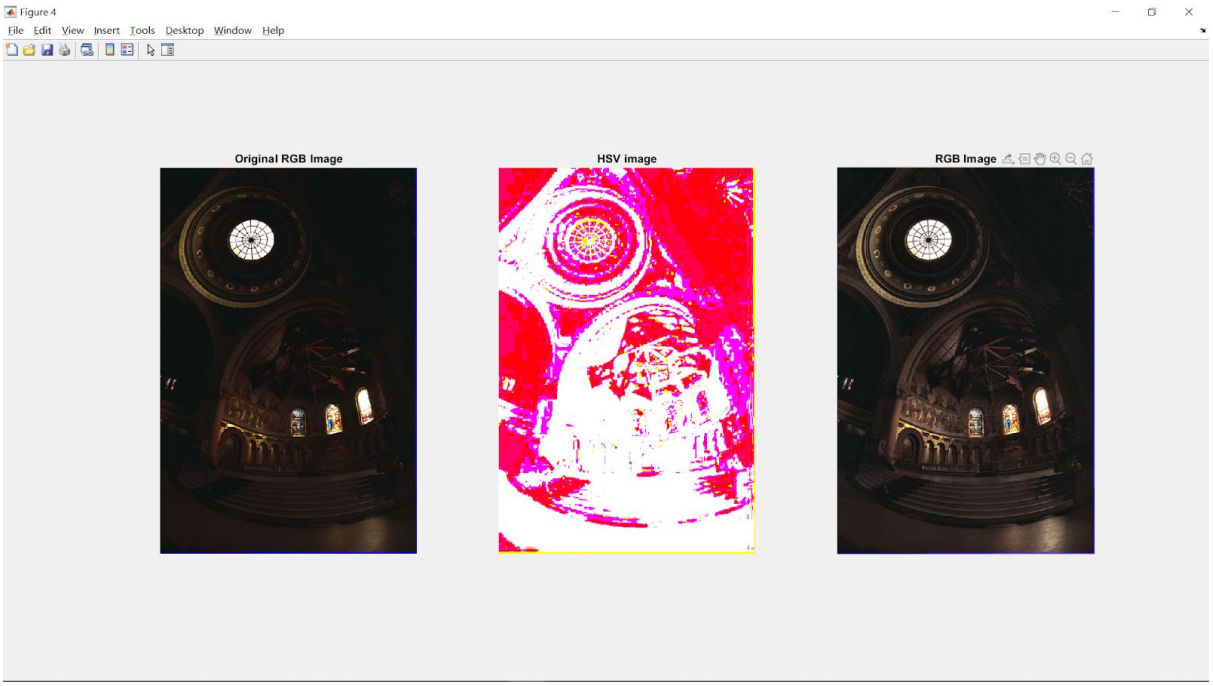

Discussions

透過RGB的呈現，使得圖像更貼近原始的樣貌，而enhancement的方法，讓原先的圖像更加精緻且真實，而在不同RGB model、HSL(HSV) model、LAB color space下，各自所呈現的enhancement的效果都具備其各自的優勢及特色，透過各種比對與測試後，即可找出適合自己條件的圖像。

References and Appendix

https://itectec.com/matlab/matlab-how-to-enhance-the-red-green-and-blue-color-within-an-image/
https://www.mathworks.com/matlabcentral/answers/46499-how-to-enhance-a-color-image
https://www.imageeprocessing.com/2013/05/converting-rgb-image-to-hsi.html