Computer Vision Assignment-2

Task1

Difference between average Hue, Saturation and Intensity for I1 and I2, where
$I1 = I(x,y)\ and\ I2 = I(x,y) * p\ ;\ p = 0.5$

Image	Image 1			Imag2			Difference		
	H1	S1	I1	H2	S2	I2	H2-H1	S2-S1	I2-I1
1.tiff	136.68	0.32	0.13	136.49	0.32	0.07	0.19	0	0.06
2.tiff	276.37	0.22	0.46	275.74	0.22	0.23	0.63	0	0.23
3..tiff	195.96	0.19	0.55	195.98	0.19	0.28	0.02	0	0.27
4..tiff	24.61	0.17	0.66	26.62	0.17	0.33	2.01	0	0.33
5..tiff	264.99	0.48	0.43	265.2	0.48	0.21	0.21	0	0.22
6..tiff	109.81	0.26	0.5	110.18	0.26	0.25	0.37	0	0.25
7..tiff	190.05	0.08	0.71	190.36	0.08	0.36	0.31	0	0.35
8..tiff	134.66	0.28	0.48	134.72	0.28	0.24	0.06	0	0.24
9..tiff	59.16	0.49	0.43	59.53	0.49	0.22	0.37	0	0.21
10..tiff	197.36	0.33	0.5	197.35	0.33	0.25	0.01	0	0.25

Observation : By multiplying $I(x,\ y)$ with a p value in {0,1} the average Intensity becomes $Intensity/p$ in the I2. Hue and Saturation remain unchanged. This can be verified from the above table.

Task 2

Difference between average Hue, Saturation and Intensity for I1 and I2, where
$I1 = I(x,y)\ and\ I2 = I(x,y) + [G(x,y) - R(x,y),\ B(x,y) - G(x,y),\ R(x,y) - B(x,y)]$

Image	Image 1			Imag2			Difference		
	H1	S1	I1	H2	S2	I2	H2-H1	S2-S1	I2-I1
1.tiff	136.68	0.32	0.13	209.95	0.98	0.03	73.27	0.66	0.1
2.tiff	276.37	0.22	0.46	126.2	1	0.06	150.17	0.78	0.4
3..tiff	195.96	0.19	0.55	147.17	1	0.07	48.79	0.81	0.48
4..tiff	24.61	0.17	0.66	285.97	1	0.06	261.36	0.83	0.6
5..tiff	264.99	0.48	0.43	235.82	1	0.15	29.17	0.52	0.28
6..tiff	109.81	0.26	0.5	182.39	1	0.08	72.58	0.74	0.42
7..tiff	190.05	0.08	0.71	65.42	1	0.03	124.63	0.92	0.68
8..tiff	134.66	0.28	0.48	165.16	1	0.07	30.5	0.72	0.41

9..tiff	59.16	0.49	0.43	284.03	1	0.13	224.87	0.51	0.3
10..tiff	197.36	0.33	0.5	236.87	1	0.12	39.51	0.67	0.38

Observation : By adding $G - R$ component to R, $B - G$ component to G and $R - B$ component to Bit circulates RGB to GBR format and hence saturation peaks out, Intensity decreases, and Hue value changes accordingly. This can be verified from the above table.

Task 3

Difference between average Hue, Saturation and Intensity for I1 and I2, where
$I1 = I(x, y)\ and\ I2 = AWB\ of\ I(x, y)$

Image	Image 1			Imag2			Difference		
	H1	S1	I1	H2	S2	I2	H2-H1	S2-S1	I2-I1
1.tiff	136.68	0.32	0.13	180.78	0.3	0.13	44.1	0.02	0
2.tiff	276.37	0.22	0.46	191.64	0.22	0.46	84.73	0	0
3..tiff	195.96	0.19	0.55	176.78	0.2	0.55	19.18	0.01	0
4..tiff	24.61	0.17	0.66	187.48	0.11	0.66	162.87	0.06	0
5..tiff	264.99	0.48	0.43	197.79	0.32	0.41	67.2	0.16	0.02
6..tiff	109.81	0.26	0.5	155.33	0.25	0.5	45.52	0.01	0
7..tiff	190.05	0.08	0.71	99.99	0.09	0.71	90.06	0.01	0
8..tiff	134.66	0.28	0.48	187.24	0.28	0.48	52.58	0	0
9..tiff	59.16	0.49	0.43	196.38	0.38	0.43	137.22	0.11	0
10..tiff	197.36	0.33	0.5	183.74	0.2	0.5	13.62	0.13	0

Observation : After automatic white balancing the Hue and Saturation are adjusted to support the gray world assumption. The Intensity remains unchanged. This can be verified from the above table.