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Assignment Number 5
Instructor: Dr. Pablo Rivas

CMPT 404L-111: Artificial Intelligence
Due: 2016-11-15

Assignment 5

Exercise *E(i). Explain..what happens when you increase or decrease the value of n_colors?*

Proof. As we can see from the image results produced from this python script (located in the Images folder), the picture is getting further and further discolored the more n_colors is decreased. Another noticeable fact is the the amount of color in the picture is also decreasing, with the minimum of 2 being comprised mainly of what seems like only 2 colors. □

Exercise *E(ii). Explain...in what other possible applications do you think this can be useful?*

Proof. While it is more visually stimulating that a majority of other algorithms we have been testing, I fail to see a purely research or machine learning application for the hw5.kmeans.img.py script. However a possible application for reducing the color composition of an image has been around for quite some time. This could be used as a funny image filter, which would show people just how much discoloration could be applied to their picture before it became unrecognizable. □

Exercise *E(iii). Why do you think the resulting picture was funny at the end?*

Proof. In a purely aesthetical way it is easy to say that because we have a certain expectation as to how our own pictures should look; however, with the final result being determined by a process that we do not fully understand our expectations were thrown out of the window. Therefore we find the final result funny because it is not what we expect of something that we can control. □

Exercise *E(iii). Explain your results. What do you think is happening? What is your interpretation of the number of neurons with respect to the performance of the network?*

Proof. As the neural network grows I'm assuming that more neurons are being dedicated to specific functions, allowing the network to make more calculated assumptions reducing the processing power needed. Given the data that was return, I believe it is safe to assume that relationship between the number of neurons and performance is proportional. As the number of neurons increase the Testing set CV score leave larger, given that larger negative numbers are worth less than the smaller ones. Example

- Neurons 1, eta 0.1. Testing set CV score: -10.332821
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- Neurons 1, eta 0.2. Testing set CV score: -7.895644
- Neurons 1, eta 0.4. Testing set CV score: -3.448646
- Neurons 3, eta 0.1. Testing set CV score: -3.284196
- Neurons 47, eta 0.2. Testing set CV score: -2.714787
- Neurons 80, eta 0.1. Testing set CV score: -2.523600
- Neurons 82, eta 0.1. Testing set CV score: -2.265865
- Neurons 89, eta 0.1. Testing set CV score: -2.121566

□
