Springboard Machine Learning Engineering Career Track

Capstone Project Proposal

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1. *(What is the problem you want to solve? Why is it an interesting problem?)*
   I want to make an automatic keyword and description generator for stock seamless pattern images.

2. *(What data are you going to use to solve this problem? How will you acquire this data?)*
   I will use seamless pattern images and their associated keywords and descriptions that I will scrape from the internet. I have collected about 100,000 such data points already, and will scrape more as needed.

3. *(In brief, outline your approach to solving this problem (knowing that you may not know everything in advance and this might change later).)*
   This is a supervised learning problem, with two different outcomes. First of all, when generating keywords, it will be a multi-label classification problem. However, when generating image descriptions, it becomes a natural language generation problem. Both of these outcomes will require deep learning approaches. Both will take an image as input, which will need to be processed through a CNN. Description generation will also require some sort of RNN.

4. *(What will be your final deliverable? This is typically an application deployed as a web service with an API or (for extra credit) a web/mobile app.)*
   I will make a web app that calls my model(s) through an API.

5. *(What computational resources would you need at a minimum to do this project?)*
   I will need at least a very powerful computer with a GPU which I do have at home. The data (at least 1TB when I scrape it all) will fit on my machine and can be loaded in batches for training, so memory shouldn't be an issue.