CS 232 HW3 Part 2 Reading Questions:

1.

Generating image captions for an album of family vacations photos may be too much of a broad task for the AI. Family vacation photos can have a range of themes and it may be too much of a difficult problem for the AI. There may be photos where the AI may encounter something that it didn't expect. Because the mental capacity of AI is much smaller compared to humans, if the tasks are too broad, the AI will most likely struggle. The narrower the task, and the more that the AI can specialize, the better they function. For example, instead of generating image captions for various photos taken during a family vacation, if it was given a more specialized task of generating a caption for pictures that had one theme: the beach, it may perform better. Also, there are many nuances that the AI will not catch and the AI may simply describe what's going on in the picture.

Several episodes of an animated TV show may not have sufficient data to accurately identify the characters from that show in a different context. AI are quite slow learners compared to humans. AI would need to train with pictures of these characters in varied context in order to figure out that the "thing" that they're looking for is the character. Similar to the sheep on the grassland. If the AI trained with images that always had sheep on grassy areas, it may mistake the "sheep" they're looking for as the grass.

One limitation of AI is that it has limited memory. In order to generate an ending for an unfinished novel by a prolific author, the AI would need to remember the storyline, the characters in the story, and from that predict what may happen. Text generation works best for AI when it needs to generate sentences that are more or less independent from each other since it doesn't need to remember the entire backstory or article at once. AI won't be able to generate a ending that makes sense according to the storyline because of the ambiguity that it may encounter that can only be resolved by remembering the previous part of the story. AI can lose track of critical information, and AI generated stories may lack the deeper meaning that humans can produce.

2.

In the Nintendo DS game, Pokemon, AI is used to simulate trainers inside the game that searches for the user and challenges them in a Pokemon battle. These AI agents navigate the map to the user (a new trainer) and their goal

is to defeat this trainer in the battle by making sure that their Pokemons don't faint in the battle. The AI agent calculates the the potential damages that their Pokemon can experience and give to and from the user's Pokemon. The AI agent has a decision tree that helps it choose its next move or action based on the current and predicted situations. For example, the AI agent can choose to heal its weakened Pokemon in battle over using a powerful move that may not completely wipe out the opponent's Pokemon. At the highest level (during the league championships), these AI agents are very difficult to defeat and have surpassed human performance many times (from personal experience and from watching other people play the game). Personally, I like to use a simple technique of using powerful moves against the opponent's Pokemon over other options such as healing my Pokemon or using moves that don't attack the opponent's Pokemon but instead raise the attack power or defense of the Pokemon. However, the AI can calculate the best actions based on my brute-force technique based on its decision tree and so has outperformed me many times. Similar to chess, if the AI agents are programmed to always defeat the users, it can most likely succeed every time. The only reason why users are allowed to win the AI agents is because the AI agents are programmed depending on the level at which the users are at.
Source: https://hackaday.com/2014/05/19/pokemon-artificial-intelligence-is-smarter-than-you/