**Homework 2**

Jesse Garcia

University of Arizona

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Karen Hand

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For my assignment in creating the best script to use to show the user how to color the map of the USA, I used chatgpt. I found several of the solutions to be difficult at first. Either, time complexity to be high or the code just would get into an endless loop. For the formulation of my code, I asked ChatGPT to give me a script with the appropriate functions like a goal\_test and successor. The first thing I needed to do was find out which blind search algorithm I was going to try and use. Blind Search is the best for this problem mainly for a few reasons. First is simplicity. They are usually very straightforward to implement, which is key for me. Another reason can be for the fact that our problem would have some deep trees, given that we have all 50 states, and then the list of surrounding states for each. We chose Depth First Search because of the deep tree like search our script was going tom be using.

ChatGPT realty helped me to grasp the concept of a Blind Search. I tend to complicate things in my head at times and can be very frustrated. Honestly, I don’t know if I would have been able to understand as deep as I have with this tool. I kept asking it questions about the script it would choose and the functions it wrote, what would be different if “this” line or “that” line was different. It seemed to always know what I was asking. However, there were some challenges. One thing I kept running into was that the code did not always run. I used the debug tool in PyCharm and it was looping infinitely at some places. So, I did have to re-ask or re-word my questions and prompts. Another issue was that it did not always write the most optimal code. But nothing I couldn’t handle since I am a professional Googler.

We initialized our graph variable, which is a dictionary the stores all states as keys, and list opf neighbors as values. Initialized the colors list, which is the list of colors we will use to color the map. Initialized coloring as an empty dictionary – this is going to be the dictionary we use to keep track of the state’s colors that have been assigned. Our **Initial State** of the script is the loop that assigns each state as a key, and “” as the value since we have not started the actual coloring. This loop assigns “” to each state and stores it in the coloring dictionary we initialized in the previous step. **GOAL TEST** – this function goal\_test takes in one parameter which is the coloring dictionary, loops through and checks if state has been colored and if it is different color from adjacent states. **Successor** Function - takes in two parameters, the state and the coloring dictionary and determines what a valid color for the state is and yields possible colors that are not assigned to the adj states. **Cost function** is not really valid here since the cost is just the next state, we can make a Cost index and see what the cost was of the entire script running and coloring all states, but I found that the cost function kept returning the same number.

Our actual running function is the color\_map function. ChatGPT told me that recursively running this function, which is the function running itself, is the best way to move forward and backward for this problem. Since this is a DFS based script, we can backtrack when we must in order to re color the states to better accommodate the next state. It starts with a state, tries a color, and then recursively moves to the next state. If it runs into an issue where a state cannot be colored because of previous choices, it backtracks, changing the color of previous states.

**References**

OpenAI. (2021). GPT-3. <https://www.openai.com>

Russell, S., & Norvig, P. (2016). *Artificial Intelligence: A Modern Approach* (3rd ed.). Pearson.