PROGRAM-12

MAP COLORING PROBLEM

AIM:-

To write and execute the python program for the Map coloring program.

PROCEDURE:-

- **color_map function**:
  - **Algorithm**:
    - Initialize an empty dictionary colored_map to store the assigned colors for each region.
    - Iterate over each region in the graph.
    - For each region, determine the set of available colors by subtracting the colors already assigned to neighboring regions from the full set of available colors.
    - Assign the first available color from the set of available colors to the current region.
    - Update the colored_map dictionary with the assigned color for the current region.
  - Return the colored_map dictionary representing the coloring of the regions.
- **Initialization**:
  - Define the graph dictionary representing the map with regions and their connections.
  - Define the colors list representing the available colors.
- **Print Result**:
  - Print the result of running the color_map function with the provided graph and colors.

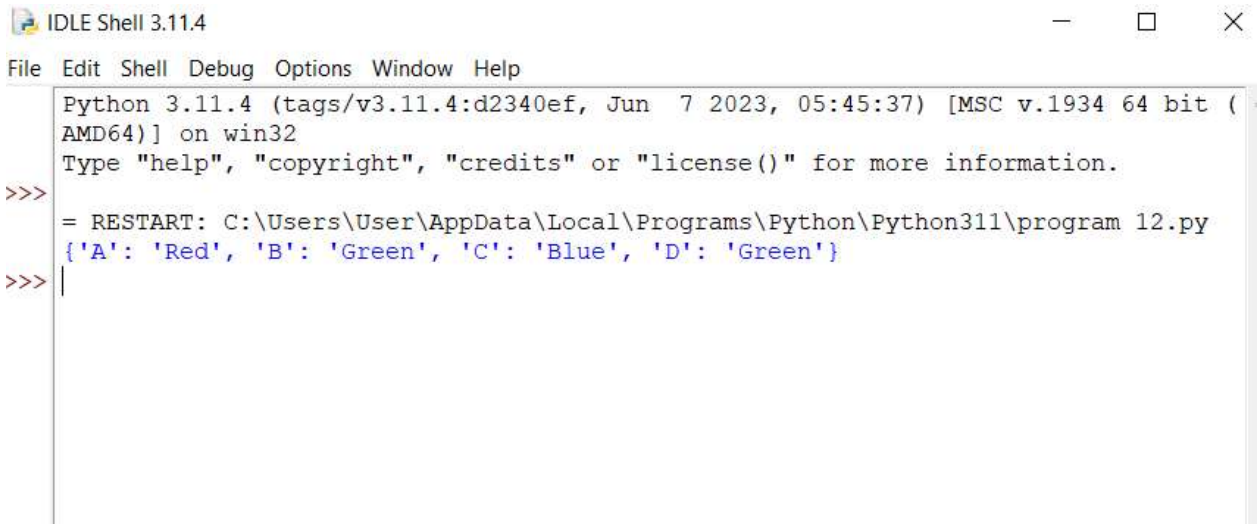
CODING:-

```
def color_map(graph, colors):

    colored_map = {}
```

```
    for region in graph:
        available_colors = set(colors)
        for neighbor in graph[region]:
            if neighbor in colored_map:
                available_colors.discard(colored_map[neighbor])
        colored_map[region] = next(iter(available_colors))
    return colored_map
graph = {
    'A': {'B', 'C', 'D'},
    'B': {'A', 'C'},
    'C': {'A', 'B', 'D'},
    'D': {'A', 'C'}
}
colors = ['Red', 'Green', 'Blue']
print(color_map(graph, colors))
```

OUTPUT:-



RESULT:-

Hence the program has been successfully executed and verified.