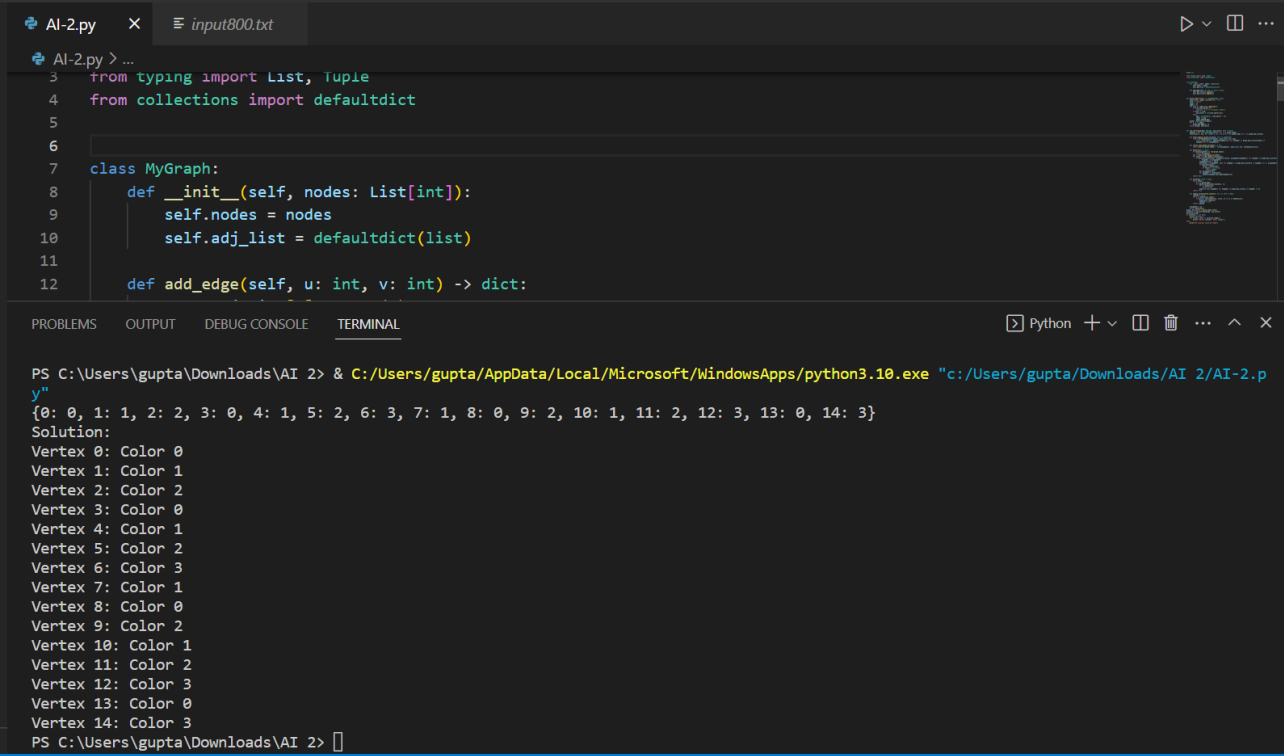


## AI Project 2 - Reeya Gupta

### Output Document

#### Output 1:

Input file: gc\_78317103208800.txt



The screenshot shows a VS Code editor with a file named `AI-2.py` open. The code defines a `MyGraph` class with an `__init__` method that takes a list of nodes and initializes an adjacency list, and an `add_edge` method. The terminal window shows the command to run the script using Python 3.10. The output displays a dictionary of nodes and their neighbors, followed by a 'Solution:' section listing 15 vertices and their assigned colors (0, 1, 2, or 3).

```
AI-2.py > ...
3 from typing import List, Tuple
4 from collections import defaultdict
5
6
7 class MyGraph:
8     def __init__(self, nodes: List[int]):
9         self.nodes = nodes
10        self.adj_list = defaultdict(list)
11
12    def add_edge(self, u: int, v: int) -> dict:

```

```
PS C:\Users\gupta\Downloads\AI 2> & C:/Users/gupta/AppData/Local/Microsoft/WindowsApps/python3.10.exe "c:/Users/gupta/Downloads/AI 2/AI-2.py"
{0: 0, 1: 1, 2: 2, 3: 0, 4: 1, 5: 2, 6: 3, 7: 1, 8: 0, 9: 2, 10: 1, 11: 2, 12: 3, 13: 0, 14: 3}
Solution:
Vertex 0: Color 0
Vertex 1: Color 1
Vertex 2: Color 2
Vertex 3: Color 0
Vertex 4: Color 1
Vertex 5: Color 2
Vertex 6: Color 3
Vertex 7: Color 1
Vertex 8: Color 0
Vertex 9: Color 2
Vertex 10: Color 1
Vertex 11: Color 2
Vertex 12: Color 3
Vertex 13: Color 0
Vertex 14: Color 3
PS C:\Users\gupta\Downloads\AI 2> 
```

#### Output 2:

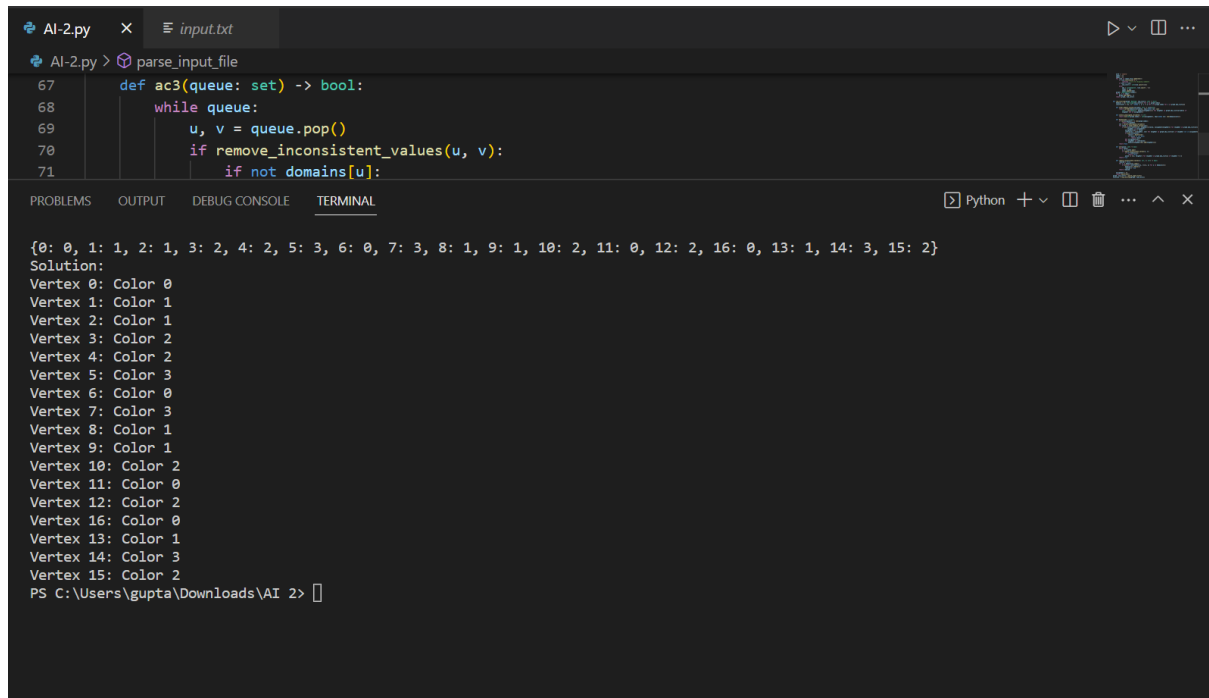
Input file: gc\_78317094521100.txt

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL Python + - [ ] [ ] ... v x
PS C:\Users\gupta\Downloads\AI 2> & C:/Users/gupta/AppData/Local/Microsoft/WindowsApps/python3.10.exe "c:/Users/gupta/Downloads/AI 2/AI-2.py"
{0: 0, 1: 1, 2: 1, 3: 1, 4: 0, 5: 2, 6: 1, 7: 2, 8: 0, 9: 0, 10: 0, 11: 1, 12: 2, 13: 1, 14: 0, 15: 2, 16: 1, 17: 0, 18: 0, 19: 0, 20: 2, 21: 0, 22: 1, 23: 1, 24: 0, 25: 2, 26: 1, 27: 2, 28: 0, 29: 1, 30: 1, 31: 2, 32: 1, 33: 2, 34: 0, 35: 0, 36: 0, 37: 2, 38: 1, 39: 1, 40: 0, 41: 2, 42: 0, 43: 2, 44: 0, 45: 2, 46: 0, 47: 1, 48: 1, 49: 1, 50: 0, 51: 0, 52: 2, 53: 0, 54: 0, 55: 1, 56: 2, 57: 2, 58: 0, 59: 3}
Solution:
Vertex 0: Color 0
Vertex 1: Color 1
Vertex 2: Color 1
Vertex 3: Color 1
Vertex 4: Color 0
Vertex 5: Color 2
Vertex 6: Color 1
Vertex 7: Color 2
Vertex 8: Color 0
Vertex 9: Color 0
Vertex 10: Color 0
Vertex 11: Color 1
Vertex 12: Color 2
Vertex 13: Color 1
Vertex 14: Color 0
Vertex 15: Color 2
Vertex 16: Color 1
Vertex 17: Color 0
Vertex 18: Color 0
Vertex 19: Color 0
Vertex 20: Color 2
Vertex 21: Color 0
Vertex 22: Color 1
Vertex 23: Color 1
Vertex 24: Color 0
Vertex 25: Color 2
Vertex 26: Color 1
Vertex 27: Color 2
Vertex 28: Color 0
Vertex 29: Color 1
```

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Vertex 23: Color 1
Vertex 24: Color 0
Vertex 25: Color 2
Vertex 26: Color 1
Vertex 27: Color 2
Vertex 28: Color 0
Vertex 29: Color 1
Vertex 30: Color 1
Vertex 31: Color 2
Vertex 32: Color 1
Vertex 41: Color 2
Vertex 42: Color 0
Vertex 43: Color 2
Vertex 44: Color 0
Vertex 45: Color 2
Vertex 46: Color 0
Vertex 47: Color 1
Vertex 48: Color 1
Vertex 49: Color 1
Vertex 50: Color 0
Vertex 51: Color 0
Vertex 52: Color 2
Vertex 53: Color 0
Vertex 54: Color 0
Vertex 55: Color 1
Vertex 56: Color 2
Vertex 57: Color 2
Vertex 58: Color 0
Vertex 59: Color 3
PS C:\Users\gupta\Downloads\AI 2> [ ]
```

### Output 3:

Input file: gc\_78317100510400.txt



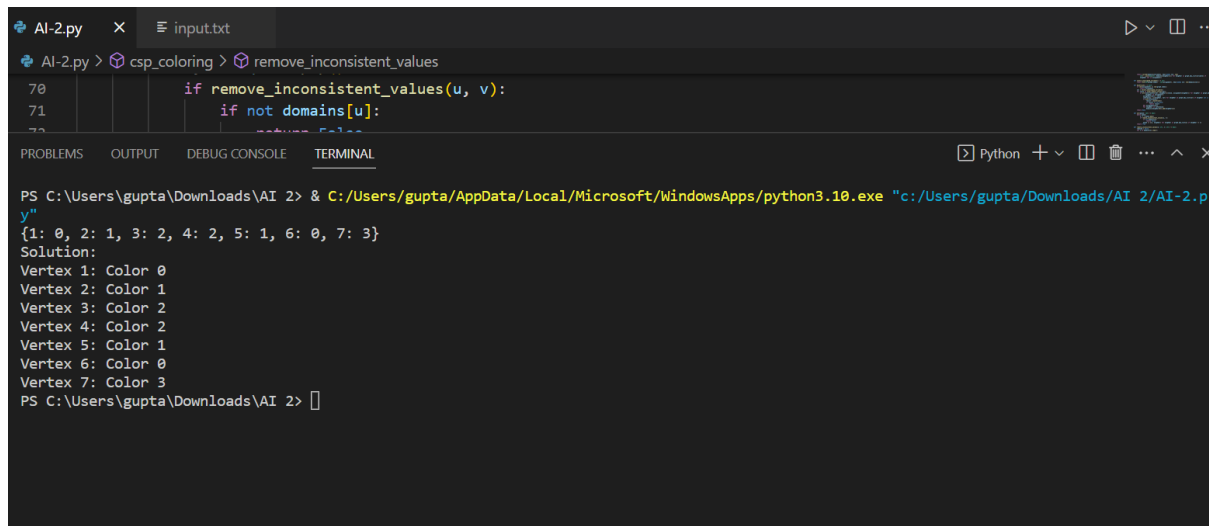
```
AI-2.py x input.txt
AI-2.py > parse_input_file
67 def ac3(queue: set) -> bool:
68     while queue:
69         u, v = queue.pop()
70         if remove_inconsistent_values(u, v):
71             if not domains[u]:

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Python + - [ ] [ ] ... ^ x

{0: 0, 1: 1, 2: 1, 3: 2, 4: 2, 5: 3, 6: 0, 7: 3, 8: 1, 9: 1, 10: 2, 11: 0, 12: 2, 16: 0, 13: 1, 14: 3, 15: 2}
Solution:
Vertex 0: Color 0
Vertex 1: Color 1
Vertex 2: Color 1
Vertex 3: Color 2
Vertex 4: Color 2
Vertex 5: Color 3
Vertex 6: Color 0
Vertex 7: Color 3
Vertex 8: Color 1
Vertex 9: Color 1
Vertex 10: Color 2
Vertex 11: Color 0
Vertex 12: Color 2
Vertex 16: Color 0
Vertex 13: Color 1
Vertex 14: Color 3
Vertex 15: Color 2
PS C:\Users\gupta\Downloads\AI 2> [ ]
```

### Output 4:

Input file: gc\_1378296846561000.txt



```
AI-2.py x input.txt
AI-2.py > csp_coloring > remove_inconsistent_values
70 if remove_inconsistent_values(u, v):
71     if not domains[u]:
72         return False

PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL
Python + - [ ] [ ] ... ^ x

PS C:\Users\gupta\Downloads\AI 2> & C:/Users/gupta/AppData/Local/Microsoft/WindowsApps/python3.10.exe "c:/Users/gupta/Downloads/AI 2/AI-2.py"
{1: 0, 2: 1, 3: 2, 4: 2, 5: 1, 6: 0, 7: 3}
Solution:
Vertex 1: Color 0
Vertex 2: Color 1
Vertex 3: Color 2
Vertex 4: Color 2
Vertex 5: Color 1
Vertex 6: Color 0
Vertex 7: Color 3
PS C:\Users\gupta\Downloads\AI 2> [ ]
```

## Output 5:

Input file: gc\_78317097930400.txt

```
PROBLEMS OUTPUT DEBUG CONSOLE TERMINAL Python + - [ ] [ ] ... ^ x

PS C:\Users\gupta\Downloads\AI 2> & C:/Users/gupta/AppData/Local/Microsoft/WindowsApps/python3.10.exe "c:/Users/gupta/Downloads/AI 2/AI-2.py"
{0: 0, 1: 1, 2: 2, 3: 1, 4: 2, 5: 1, 6: 2, 7: 2, 8: 0, 9: 0, 10: 3, 11: 0, 12: 1, 13: 3, 14: 2, 15: 0, 16: 3, 17: 1, 18: 3, 19: 2, 20: 0, 21: 1, 22: 3}
Solution:
Vertex 0: Color 0
Vertex 1: Color 1
Vertex 2: Color 2
Vertex 3: Color 1
Vertex 4: Color 2
Vertex 5: Color 1
Vertex 6: Color 2
Vertex 7: Color 2
Vertex 8: Color 0
Vertex 9: Color 0
Vertex 10: Color 3
Vertex 11: Color 0
Vertex 12: Color 1
Vertex 13: Color 3
Vertex 14: Color 2
Vertex 15: Color 0
Vertex 16: Color 3
Vertex 17: Color 1
Vertex 18: Color 3
Vertex 19: Color 2
Vertex 20: Color 0
Vertex 21: Color 1
Vertex 22: Color 3
PS C:\Users\gupta\Downloads\AI 2> [ ]
```