KIET Group of Institutions, Ghaziabad

Department of Computer Applications

(An ISO – 9001: 2015 Certified & 'A' Grade accredited Institution by NAAC)

Artificial Intelligence Lab

KCA 351: Session 2021-22

Experiment – No-7

Problem Statement : **City Coloring problem: The problem is Constraint Satisfaction Problem. The problem is to color each city using only three colors but no adjacent cities can be colored the same. The problem might seem so easy but it's really challenging how to tell this to a machine. But using prolog logic it is kind of easier because all you have to do is to specify the rules of the problem and prolog will answer.**

Program:

```
pip install pytholog
import pytholog as pl
city_color = pl.KnowledgeBase("city_color")
city_color([
    "different(red, green)",
    "different(red, blue)",
    "different(green, red)",
    "different(green, blue)",
    "different(blue, red)",
    "different(blue, green)",
    "coloring(A, M, G, T, F) :-
 different(M, T),different(M, A),different(A, T),different(A, M),different
(A, G),different(A, F),different(G, F),different(G, T)"
])
print(city_color.query(pl.Expr("coloring(Alabama, Mississippi, Georgia, Te
nnessee, Florida)"), cut = True))
```

Output :

```
[13] pip install pytholog
```

```
Collecting pytholog
  Downloading pytholog-2.4.1-py3-none-any.whl (16 kB)
Requirement already satisfied: more-itertools in /usr/local/lib/python3.7/dist-packages (from pytholog) (8.12.0)
Installing collected packages: pytholog
Successfully installed pytholog-2.4.1
```

```
import pytholog as pl
city_color = pl.KnowledgeBase("city_color")
city_color([
    "different(red, green)",
    "different(red, blue)",
    "different(green, red)",
    "different(green, blue)",
    "different(blue, red)",
    "different(blue, green)",
    "coloring(A, M, G, T, F) :- different(M, T),different(M, A),different(A, T),different(A, M),different(A, G),diff
])
print(city_color.query(pl.Expr("coloring(Alabama, Mississippi, Georgia, Tennessee, Florida)"), cut = True))
```

```
[{'Alabama': 'green', 'Mississippi': 'blue', 'Georgia': 'blue', 'Tennessee': 'red', 'Florida': 'red'}]
```

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