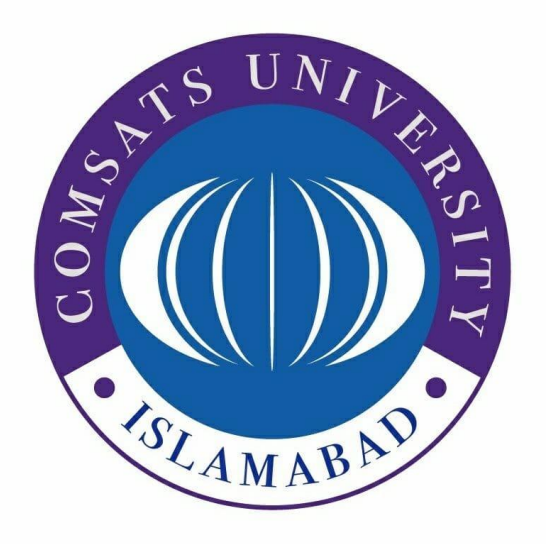
COMSATS UNVERISTY ISLAMABAD



Artificial Intelligence

Lab 11

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Activity 1:

Code:

```
from constraint import Problem, AllDifferentConstraint

regions = ["Western Australia", "Northern Territory", "South Australia",
"Queensland", "New South Wales", "Victoria", "Tasmania"]
colors = ["red", "green", "blue"]
neighbors = [("Western Australia", "Northern Territory"), ("Western Australia",
"South Australia"), ("South Australia", "Northern Territory"),
             ("Queensland", "Northern Territory"), ("Queensland", "South
Australia"), ("Queensland", "New South Wales"),
             ("New South Wales", "South Australia"), ("Victoria", "South
Australia"), ("Victoria", "New South Wales"),
             ("Victoria", "Tasmania")]
problem = Problem()
problem.addVariables(regions, colors)
for neighbor in neighbors:
    problem.addConstraint(AllDifferentConstraint(), neighbor)
solutions = problem.getSolutions()
for solution in solutions:
    print(solution)
```

Output:

Activity 2:

Code:

```
from constraint import Problem, AllDifferentConstraint


problem = Problem()

problem.addVariables(range(4), range(4))

problem.addConstraint(AllDifferentConstraint())

problem.addConstraint(lambda q1, q2, q3, q4: abs(q1 - q2) != 1 and abs(q1 - q3)
!= 2 and abs(q1 - q4) != 3 and
                                            abs(q2 - q3) != 1 and abs(q2 - q4) != 2
and abs(q3 - q4) != 1,
                                            (0, 1, 2, 3))

solutions = problem.getSolutions()
for solution in solutions:
    print(solution)
```

Output:

```
@HasaanAhmad ➜/workspaces/AI-lab-manual-Solved
py"
{0: 2, 1: 0, 2: 3, 3: 1}
{0: 1, 1: 3, 2: 0, 3: 2}
```