



**Green University of Bangladesh**  
**Department of Computer Science and Engineering (CSE)**  
**Faculty of Sciences and Engineering**  
**Semester: (Spring, Year:2023), BSc. in CSE (Day)**

**LAB REPORT - 04**

**Course Title:** Artificial Intelligence Lab

**Course Code:** CSE-316

**Section:** PC-201 DC

**Student Details**

Name		Students Id
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**Lab Date:** 20-05-2023

**Submission Date:** 27-05-2023

**Course Teacher's Name:** Rusmita Halim Chaity

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**Lab Report Status**

**Marks:** .....

**Signature:** .....

**Comments:** .....

**Date:** .....

## 1. TITLE OF THE LAB EXPERIMENT

Implement a program to perform N Queen problem using Genetic Algorithm.

## 2. OBJECTIVES/AIM

- To learn Basic Operations on Python such as Lists, Tuple, Dictionary.
- To acquire knowledge about python.
- To learn about Genetic Algorithm.
- To learn about N Queen problem.
- To learn python operators.
- To learn conditional statements in python.
- To learn loops in python.
- To learn functions in python.

## 3. PROCEDURE / ANALYSIS / DESIGN

**Problem:** Implement a program to perform N Queen problem using Genetic Algorithm.

## 4. IMPLEMENTATION

### Code of problem:

```
import random
```

```
class Board:
def __init__(self, size, queens=None):
self.size = size
if queens is None:
self.queens = [random.randint(0, size-1) for _ in range(size)]
else:
self.queens = queens

def __str__(self):
rows = []
for row in range(self.size):
col = self.queens[row]
rows.append(' '.join('Q' if i == col else '*' for i in range(self.size)))
return '\n'.join(rows)
```

```
def fitness(self):
attacks = 0
for i in range(self.size):
for j in range(i+1, self.size):
if self.queens[i] == self.queens[j] or abs(self.queens[i] - self.queens[j]) == abs(i - j):
attacks += 1
return self.size*(self.size-1)/2 - attacks
```



## 5. TEST RESULT / OUTPUT

```
Enter the number of Queen: 10
The perfect place for 10 Queens:
* * * * * Q * * * *
* * * * * * * Q * *
* * Q * * * * * * *
Q * * * * * * * * *
* * * * * * * * Q *
* * * * * * Q * * *
* * * * * * * * * Q
* * * Q * * * * * *
* Q * * * * * * * *
* * * * Q * * * * *
```

**Figure\_01:** Output of problem

According to this output 1<sup>st</sup> user can put a number to place queen in that number\*number board. Like 10 queens then 10\*10 board. Now we put all queen inside the created board where no queen can't attack another queen. This work is done by Genetic Algorithm then finally print the placement of all queen in the created board.

## 6. ANALYSIS AND DISCUSSION

This experiment mainly based on software. So, it may have so software error. Based on the focused objective(s) to learn the step-by-step working system of this problem. This problem work with recursive that's why I can't easily understand. Genetic Algorithm is new for us. The task will help us to create new new solution from different problems. The main hard part of this experiment is successfully completed the problem using Genetic Algorithm. We face so many problem for understanding new new function of python and their working system. Now, we get so many knowledge to execute those function. Those are very important for our future lab task.