Default Parameters
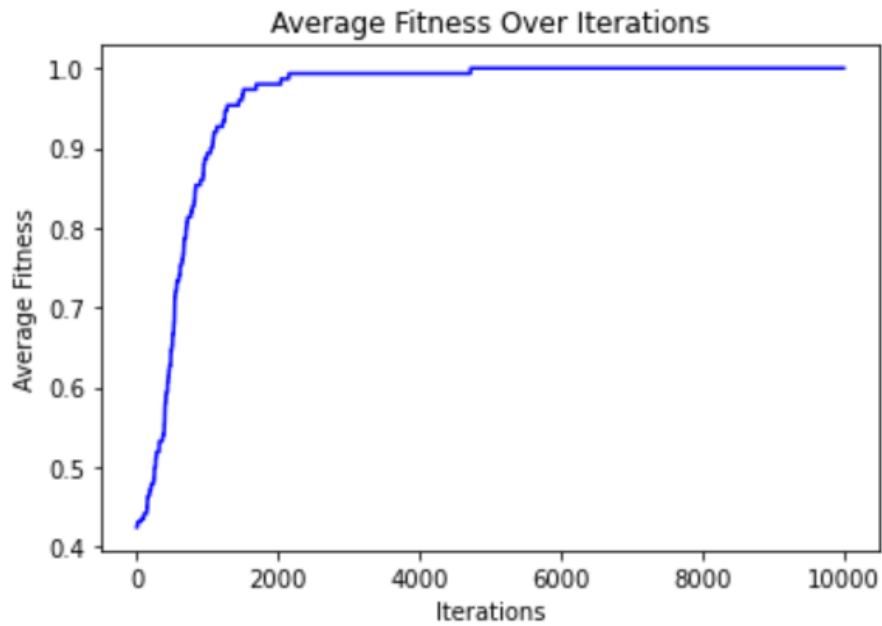
Population size: 100, mutation probability: 0.8, offspring count: 2, termination limit: 10000, number of runs: 100

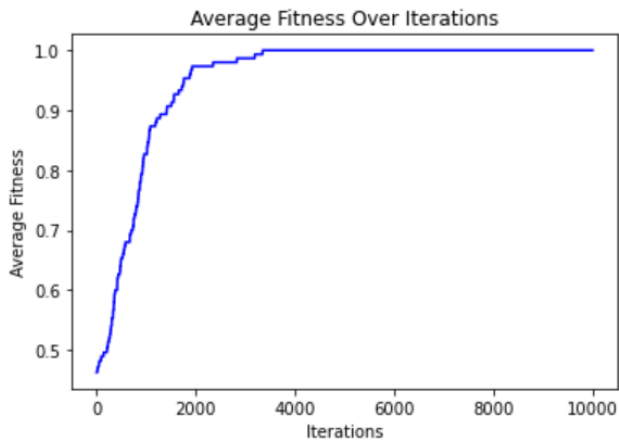## Average Fitness Over Iterations


```
Best Solution:
.  .  .  .  .  .  .Q.
.  .  .  .  .Q.  .  .
.  .  .Q.  .  .  .  .
.Q.  .  .  .  .  .  .
.  .  .  .  .  .Q.  .
.  .  .  .  .  .  .  .Q
.  .Q.  .  .  .  .  .
.  .  .  .Q.  .  .  .

-----------------
Positions: [6, 4, 2, 0, 5, 7, 1, 3]
Average time taken for each trial: 17.836043467521666 seconds
```
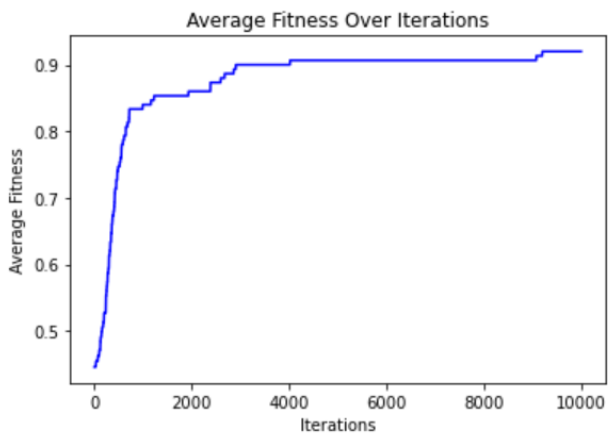
Changing mutation Probability

Increasing to 0.999

Average Fitness Over Iterations

```
Best Solution:
. . . . .Q. . . .
. . . . . . . .Q.
. .Q. . . . . . .
. . . .Q. . . . .
. . . . . . . . .Q
.Q. . . . . . .
. . .Q. . . . .
. . . . . .Q. .

-----------------
Positions: [4, 6, 1, 3, 7, 0, 2, 5]
Average time taken for each trial: 24.738975203037263 seconds
```

Decreasing to 0.2

Average Fitness Over Iterations

```
Best Solution:
. . .Q. . . . .
. . . . .Q. . .
. .Q. . . . . .
. . . . . . .Q
.Q. . . . . . .
. . . . . . .Q.
. . . .Q. . . .
. . . . . .Q. .

-----------------
Positions: [2, 4, 1, 7, 0, 6, 3, 5]
Average time taken for each trial: 17.603850226402283 seconds
```
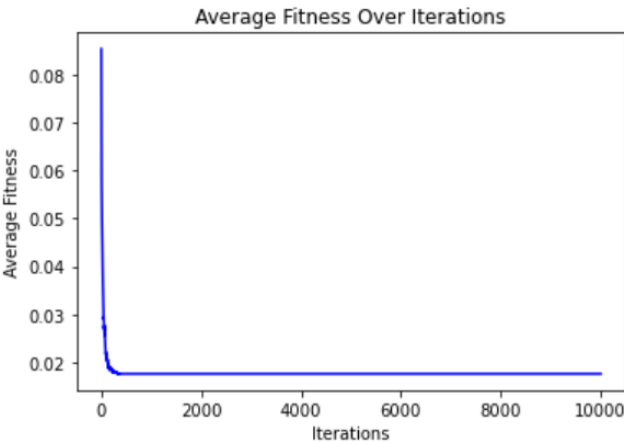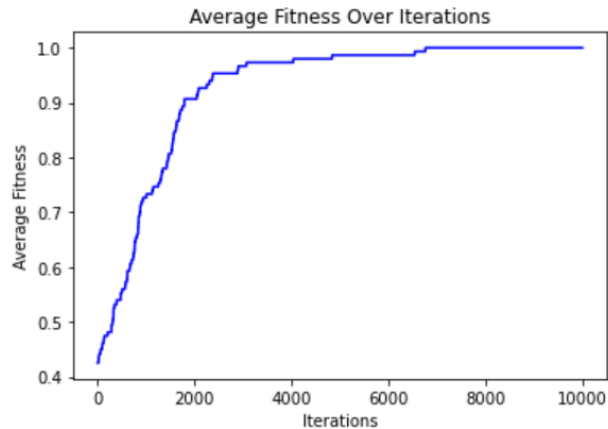
Changing offspring count

Increasing to 50

Average Fitness Over Iterations


```
Best Solution:
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .
.  .  .Q.  .  .  .  .  .

-----------------
Positions: [2, 2, 2, 2, 2, 2, 2, 2]
Average time taken for each trial: 15.971046731472015 seconds
```

Decreasing to 1

Average Fitness Over Iterations


```
Best Solution:
.  .  .  .  .  .  .Q.
.  .Q.  .  .  .  .  .
.  .  .  .Q.  .  .  .
.Q.  .  .  .  .  .  .
.  .  .  .  .  .  .  .Q
.  .  .  .  .Q.  .  .
.  .  .Q.  .  .  .  .
.  .  .  .  .  .Q.  .

-----------------
Positions: [6, 1, 3, 0, 7, 4, 2, 5]
Average time taken for each trial: 30.76847900390625 seconds
```

Changing the population size

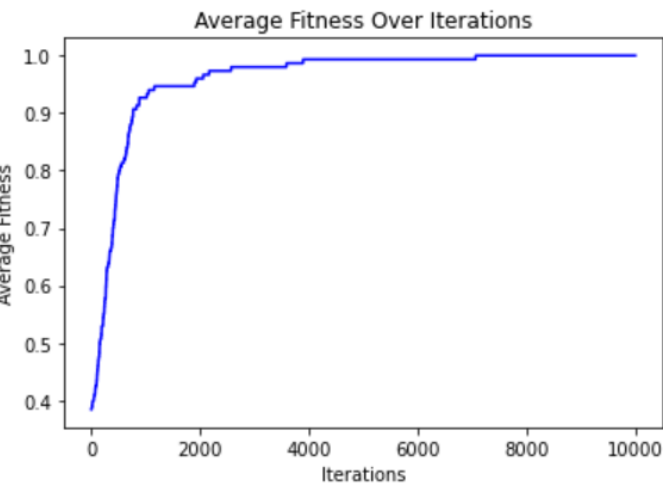## Increasing to 500


```
Average Fitness Over Iterations
```
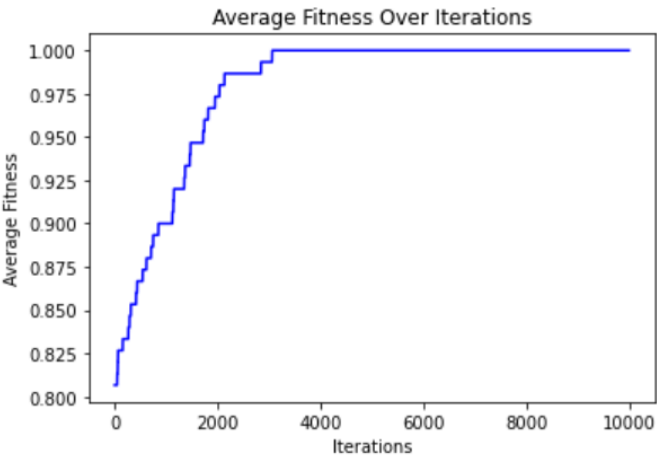
```
Best Solution:
. . .Q. . . . .
. . . . . .Q. .
. .Q. . . . . .
. . . . . . .Q.
.Q. . . . . . .
. . .Q. . . . .
. . . . . . . .Q
. . . . .Q. . .

-----------------
Positions: [2, 5, 1, 6, 0, 3, 7, 4]
Average time taken for each trial: 87.20905075311661 seconds
```

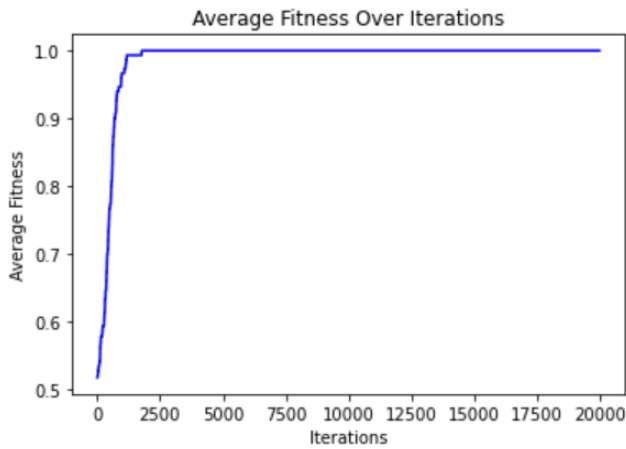## Decreasing to 50


```
Average Fitness Over Iterations
```

```
Best Solution:
. . . .Q. . . .
. . . . . . .Q.
. . . . .Q. . .
. . .Q. . . . .
.Q. . . . . . .
. . . . . .Q. .
. . . . . . . .Q
. .Q. . . . . .

-----------------
Positions: [3, 6, 4, 2, 0, 5, 7, 1]
Average time taken for each trial: 9.067642471790315 seconds
```
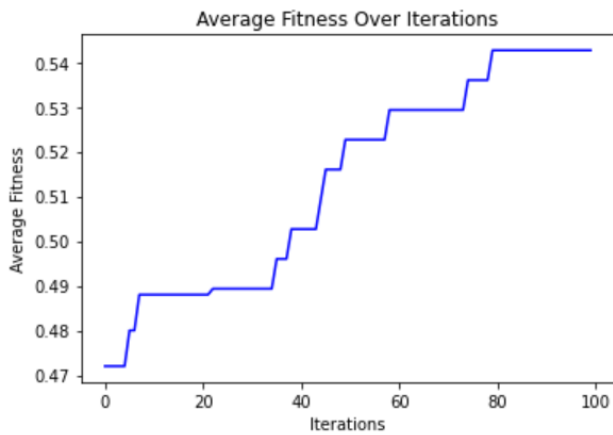
Changing the termination limit

Increasing to 20000

Average Fitness Over Iterations

```
Best Solution:
.  .  .  .  .  .  .Q.
.  .  .Q.  .  .  .  .
.Q.  .  .  .  .  .  .
.  .  .  .  .  .Q.  .
.  .  .  .  .  .  .  .Q
.  .  .  .  .Q.  .  .
.  .Q.  .  .  .  .  .
.  .  .  .Q.  .  .  .

-----------------
Positions: [6, 2, 0, 5, 7, 4, 1, 3]
Average time taken for each trial: 36.08819560050964 seconds
```

Decreasing to 100

Average Fitness Over Iterations

```
Best Solution:
.  .  .  .Q.  .  .  .
.  .  .  .  .  .Q.  .
.Q.  .  .  .  .  .  .
.  .  .  .  .Q.  .  .
.  .Q.  .  .  .  .  .
.  .  .  .  .  .  .  .Q
.  .  .Q.  .  .  .  .
.  .  .  .  .  .  .Q.

-----------------
Positions: [3, 5, 0, 4, 1, 7, 2, 6]
Average time taken for each trial: 0.18287575006484985 seconds
```