Lab Artificial Intelligence

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## What is the maximum value of fitness?

The maximum value of fitness is 17. It is equal to the length of the target.

## What type of crossover is used?

We are using the uniform crossover because in this crossover, we do not divide the chromosome into segments; rather we treat each gene separately.

## What type of selection is used?

The type of selection used is the Roulette Wheel Selection.

## Varying ngen

|  |  |
| --- | --- |
| Ngen | Fitness |
| 500 | 14 |
| 800 | 15 |
| 1000 | 15 |
| 1500 | 15 |
| 2000 | 16 |
| 2500 | 17 |

## Ngen variation

In my case I got the target phrase with ngen > 2000 but it depends. Sometimes you can get the target before 1500 or before 2000.

It is possible to get a target with a lower ngen but its percentage of getting it is very low.

## Varying ngen three times

|  |  |
| --- | --- |
| Ngen = 1000 | Fitness |
| 1st round | 15 |
| 2nd round | 15 |
| 3rd round | 15 |

## Varying the function ‘new\_population’ into a one line code

Here I tried doing with a lambda expression as looping over the population and returning into a new list the mutated child. But I couldn’t express it in a coding way.

For example maybe returning new.pop.append(mutate(recombine(select(2,population,fitness\_fn)),gene\_pool,mutation\_rate))

And all of that will be looped for individual in population

## Question 8

Yes, the fitness can have a lower value when passing from a generation for another.

I realized while running for example when getting to generation 650 the fitness is 14 and when passing to 700 the fitness decreases to 13 and then goes back to 14 and higher.