Geneticky algoritmus Snake

Mapa:
Omezeny obdelnik s rozmery x a y, kde x >= 2, y >= 2.

Genotyp:
72 cisla, ktera reprezentuji pravdepodobnost vybrat jeden ze tri kroku(Left, Right, Forward). Cisla v rozsahu [-99; 99].

Crossover:
N points.

Selection:
Roulette
Tournament.

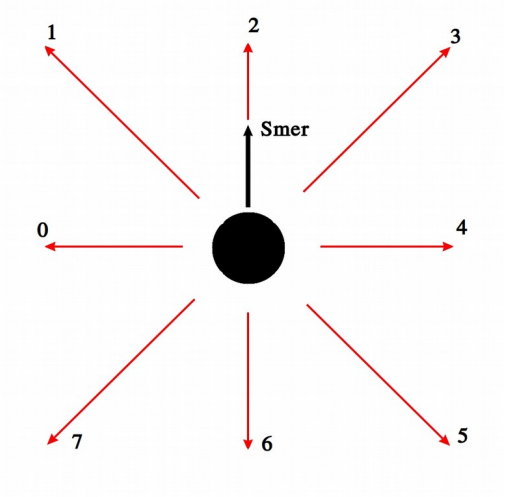
Fitness:
Fitness = [delka hadu] * 100 + 1.
V pripade jestli had se narazi na sebe se odecita 10% od hodnoty fitness.

Zdravi:
Had na zacatku ma zdravi rovne 40% od x*y(kde x a y jsou rozmery mapy). Kazdy krok odecita 1 bod zdravi. Kdyz had najde jidlo, bude mit zdravi rovne 40% od x*y(kde x a y jsou rozmery mapy) + 2 * delka hadu.

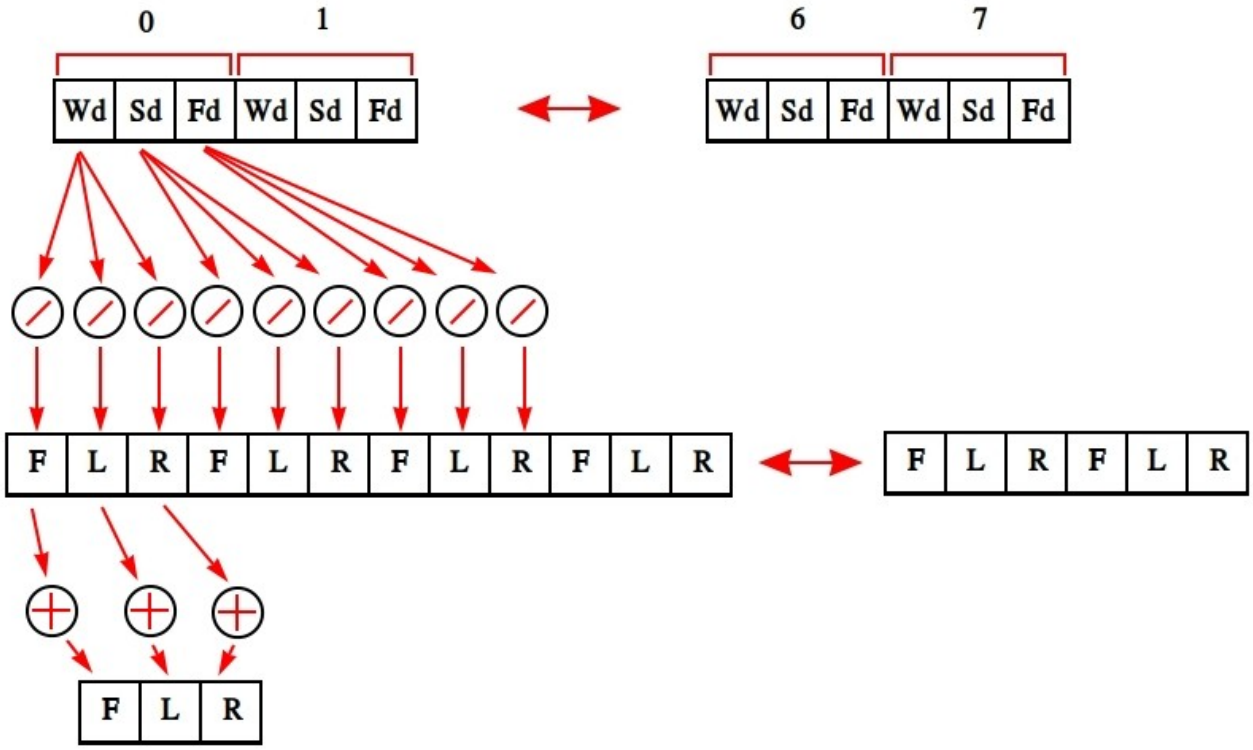
Postup:

Had se diva kolem sebe do 8 smeru. V kazdem smeru dostava 3 cisla:

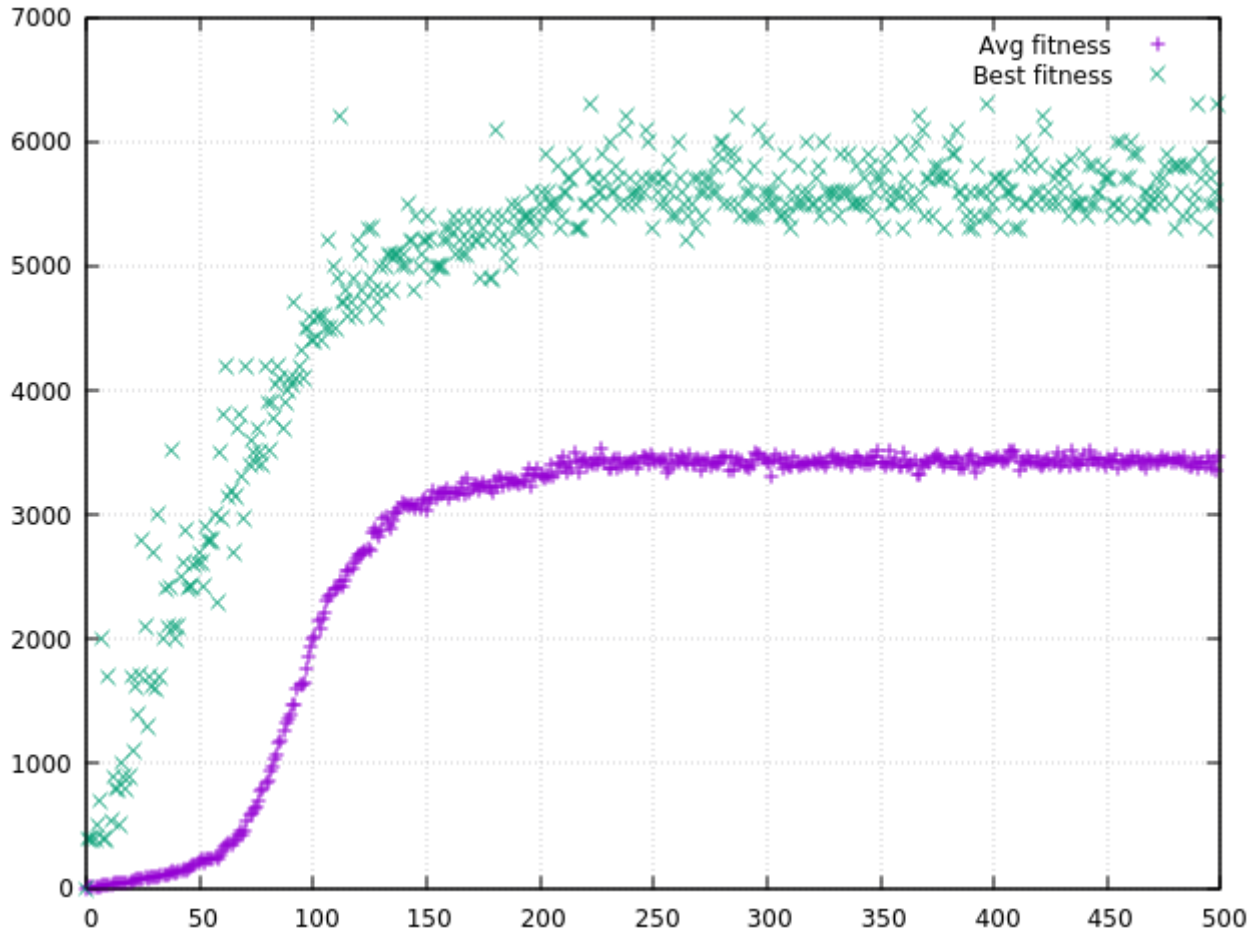
1) distance do zedi,
2) distance do sebe(nebo -1 jestli neexistuje),
3) distance do jedla(nebo -1 jestli neexistuje).



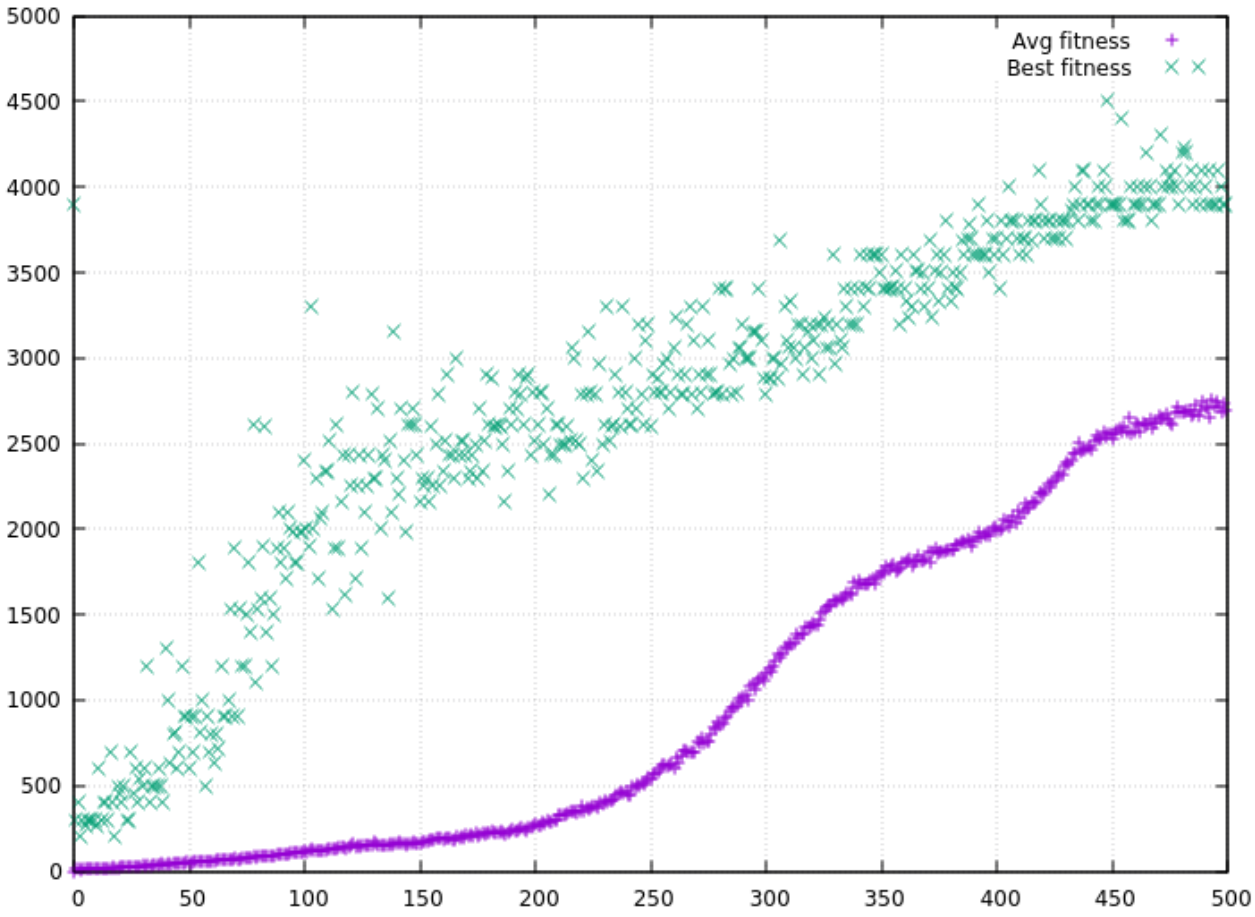
Takovym spusobem v kazdem kroku had ma 24 cisla. Prvnim cislem rozdelime 1, 2, 3 cisla genotypu a poporadi pricteme k vystupnimu poli(na zacatku inicializovanomu nulami). Druhim cislem rozdelime 4, 5, 6 cisla genotypu a tak dale. Jestli cislo se rovna -1 nedelame nic.
Ve vysledku mane pole s tri prvky, kde prvni reprezentuje pavdepodobnost kroku dopredu, druhy kroku doleva, treti doprava. Vybereme nejvetsi pravdepodobnost a zvolime ten krok.



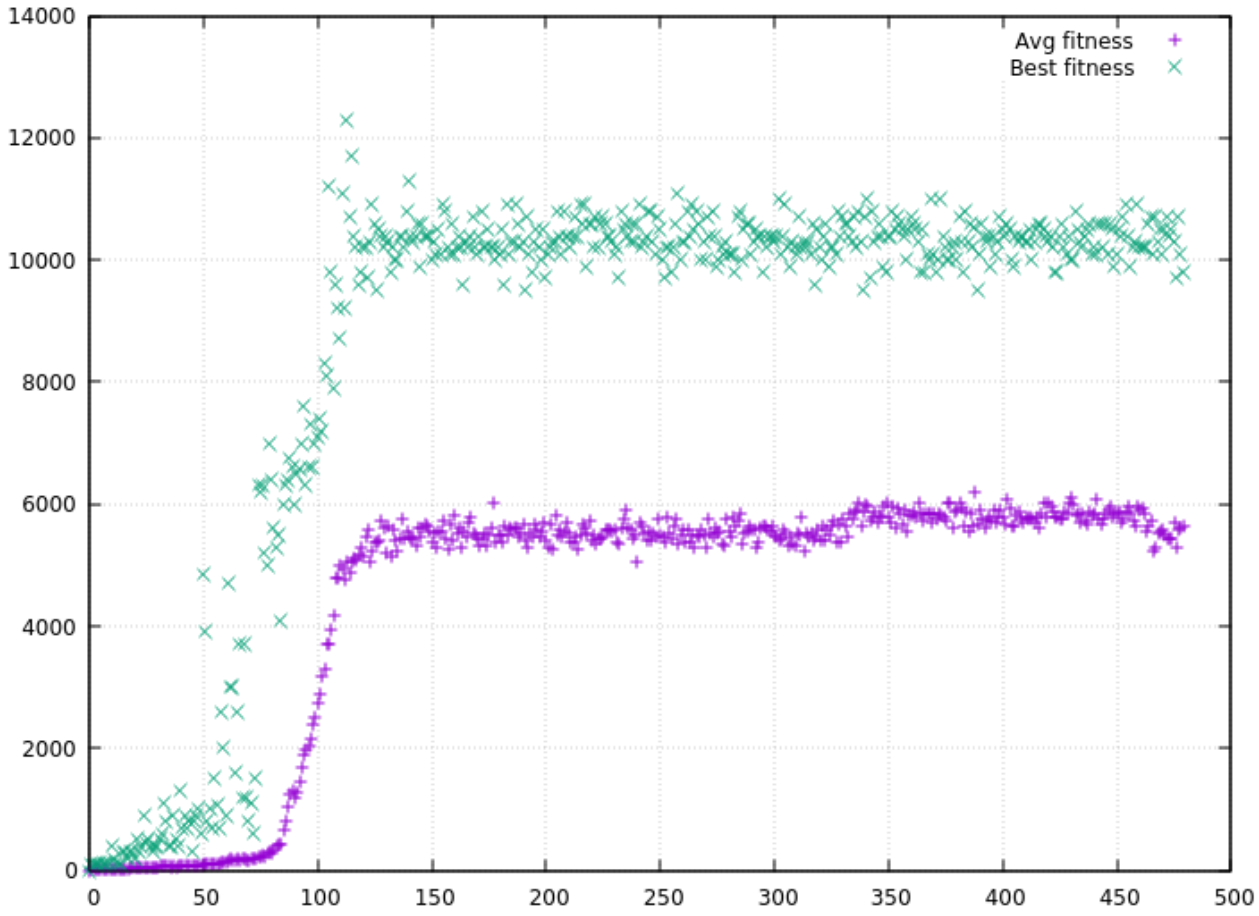
Population size: 1000
Iterations: 500
Map size: 10x10
Crossover rate: 50%
Mutation rate: 20%
Selection: roulette



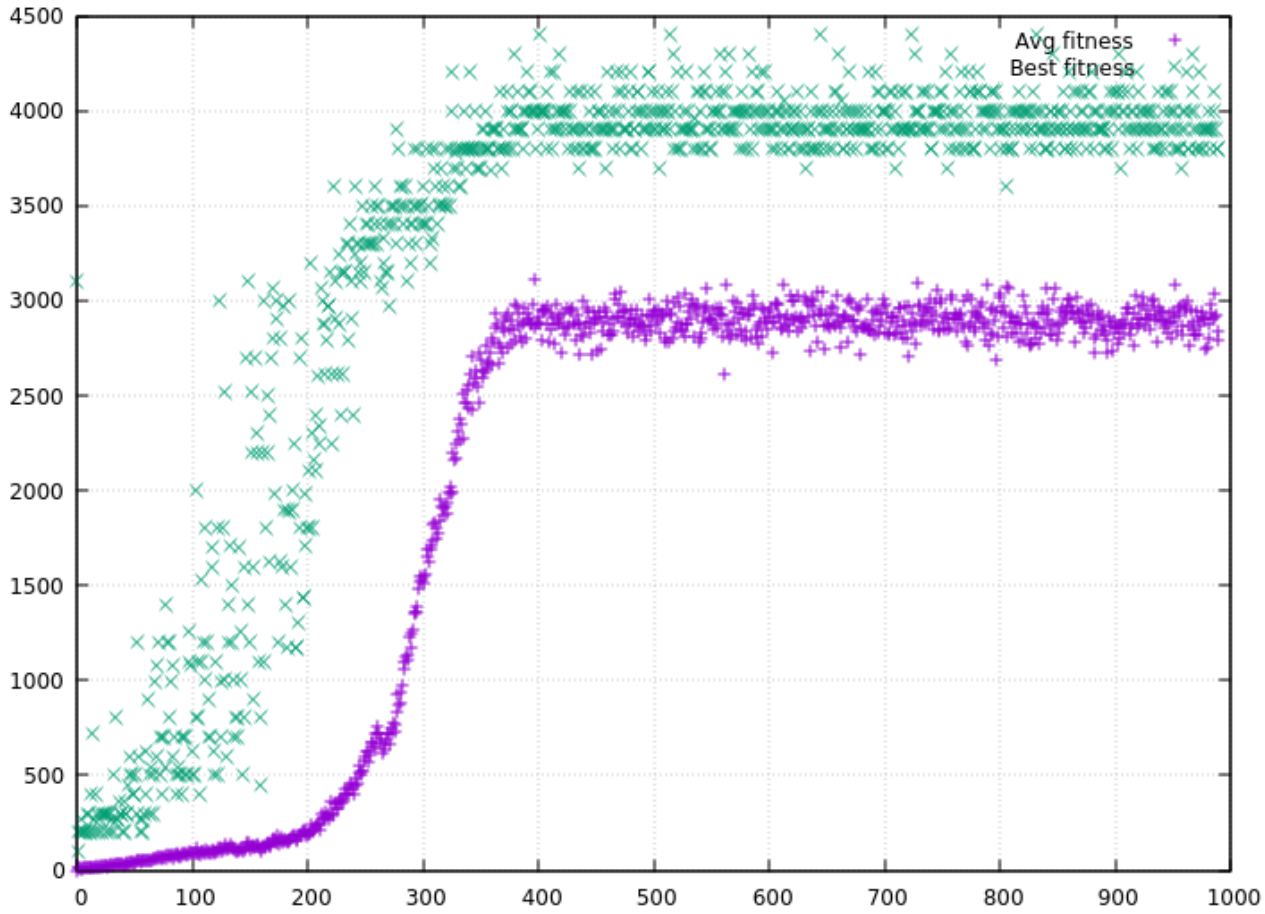
Population size: 1000
Iterations: 500
Map size: 10x10
Crossover rate: 20%
Mutation rate: 20%
Selection: roulette



Population size: 250
Iterations: ~500
Map size: 30x30
Crossover rate: 50%
Mutation rate: 10%
Selection: roulette



Population size: 200
Iterations: 1000
Map size: 10x10
Crossover rate: 20%
Mutation rate: 20%
Selection: roulette



Population size: 1000
Iterations: 500
Map size: 250 iterations — 10x10, 250 iteration - 20x20
Crossover rate: 50%
Mutation rate: 20%
Selection: roulette