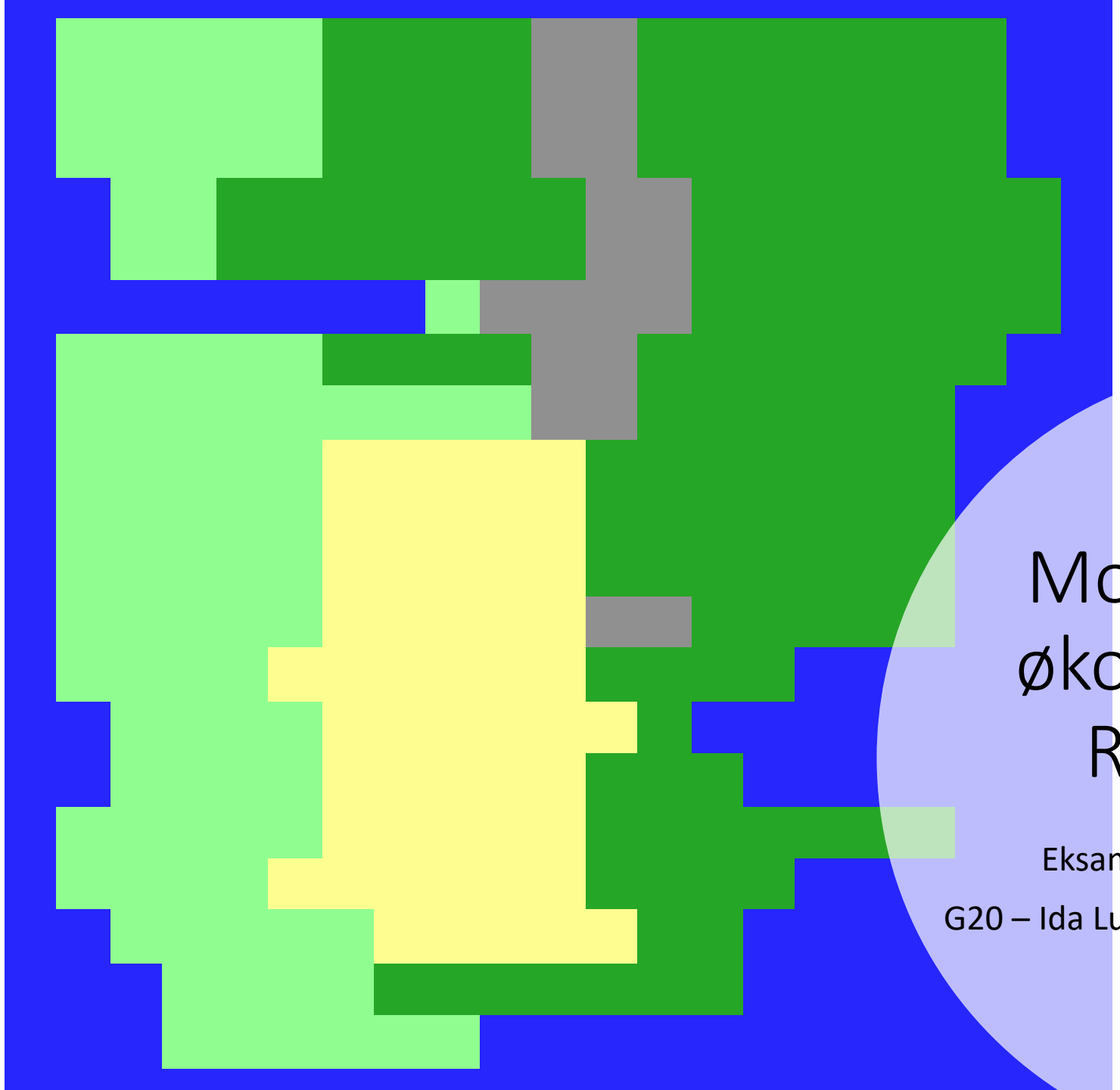
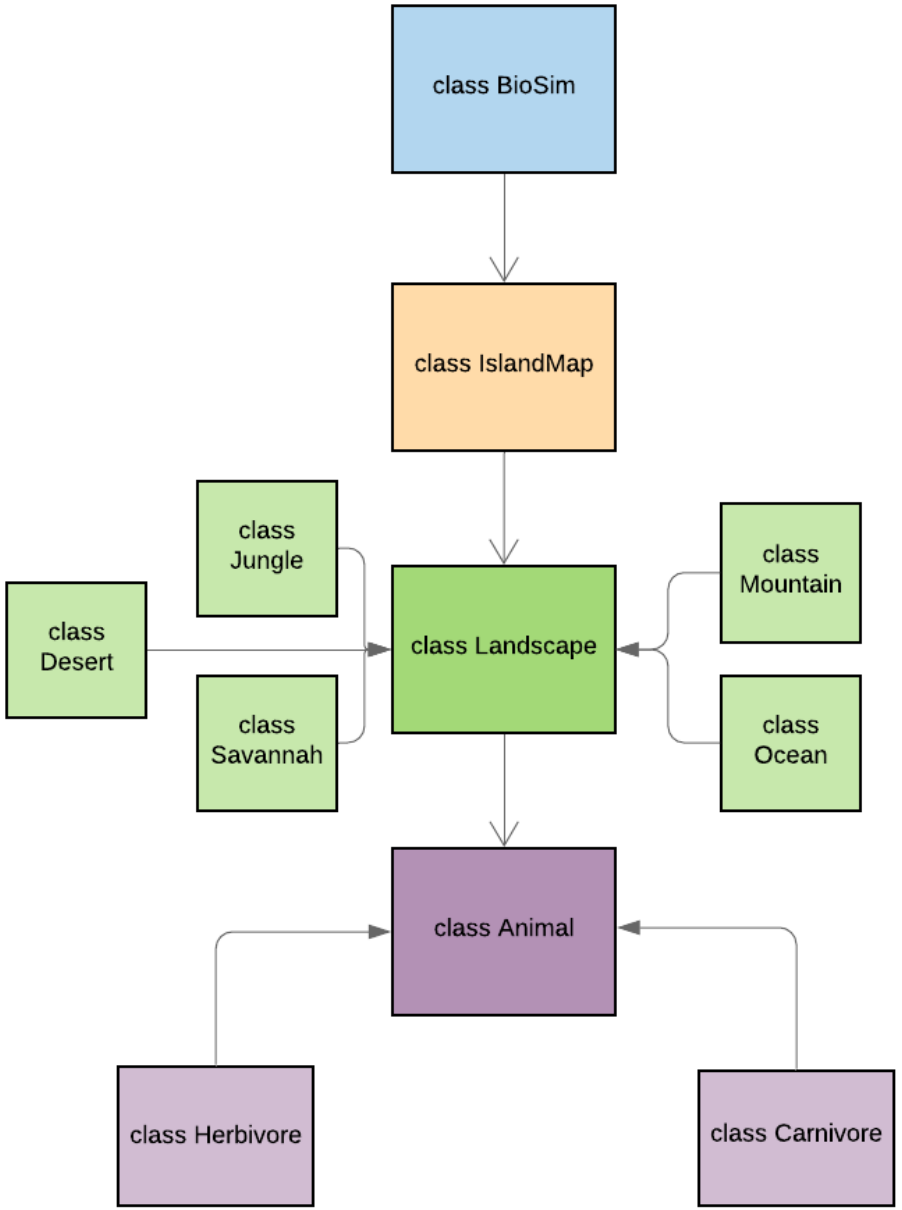


Modellering av økosystemet på Rossumøya

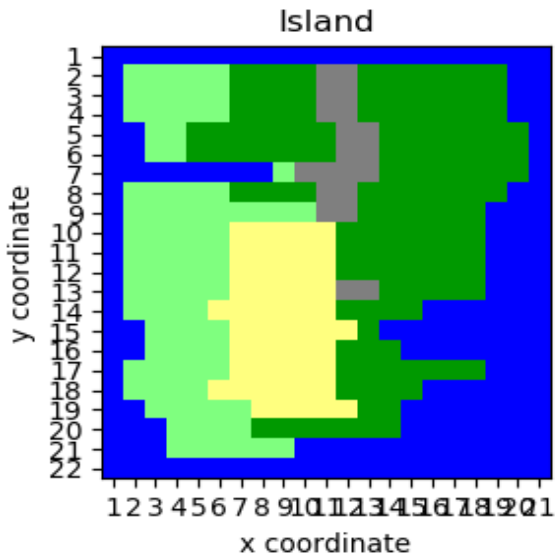
Eksamen i INF200 januar 2020

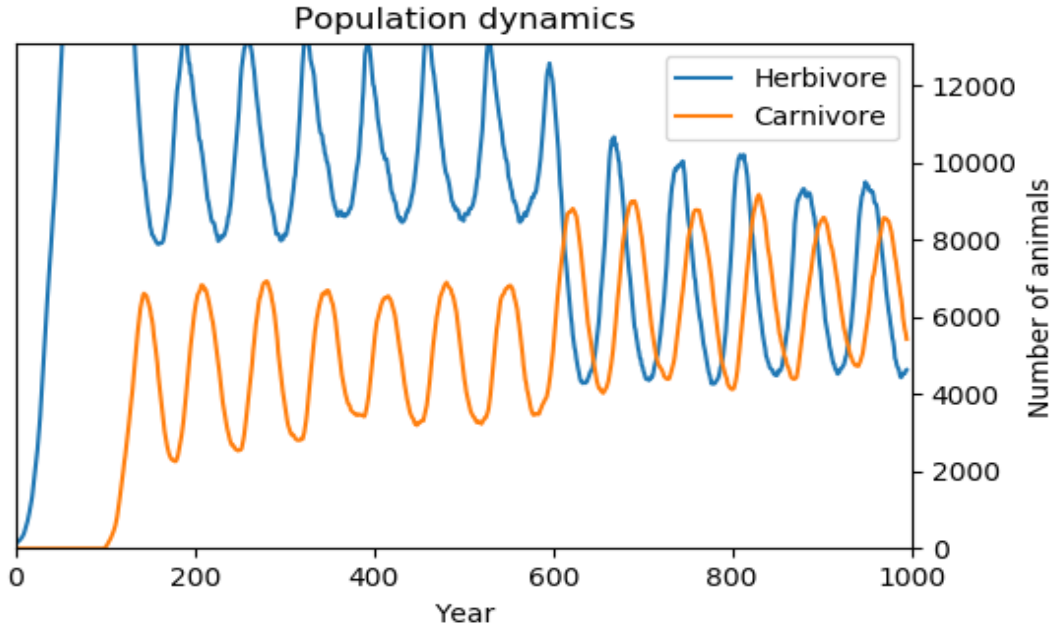
G20 – Ida Lunde Naalsund og Kjersti Rustad Kvisberg

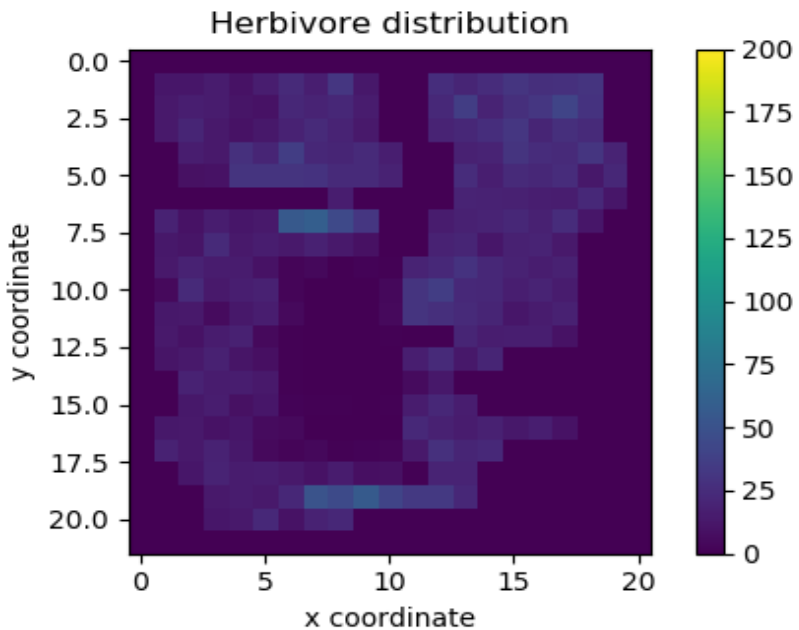
Struktur for BioSim

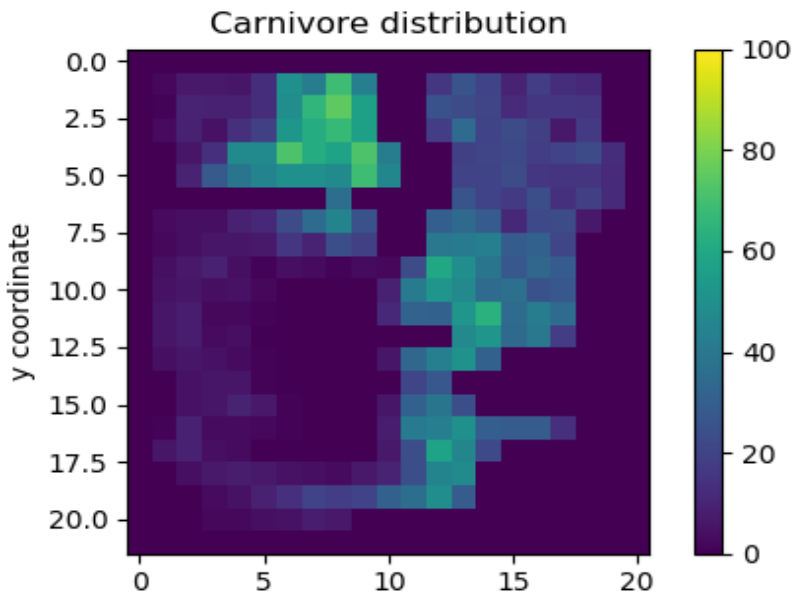


Simulation of year 995



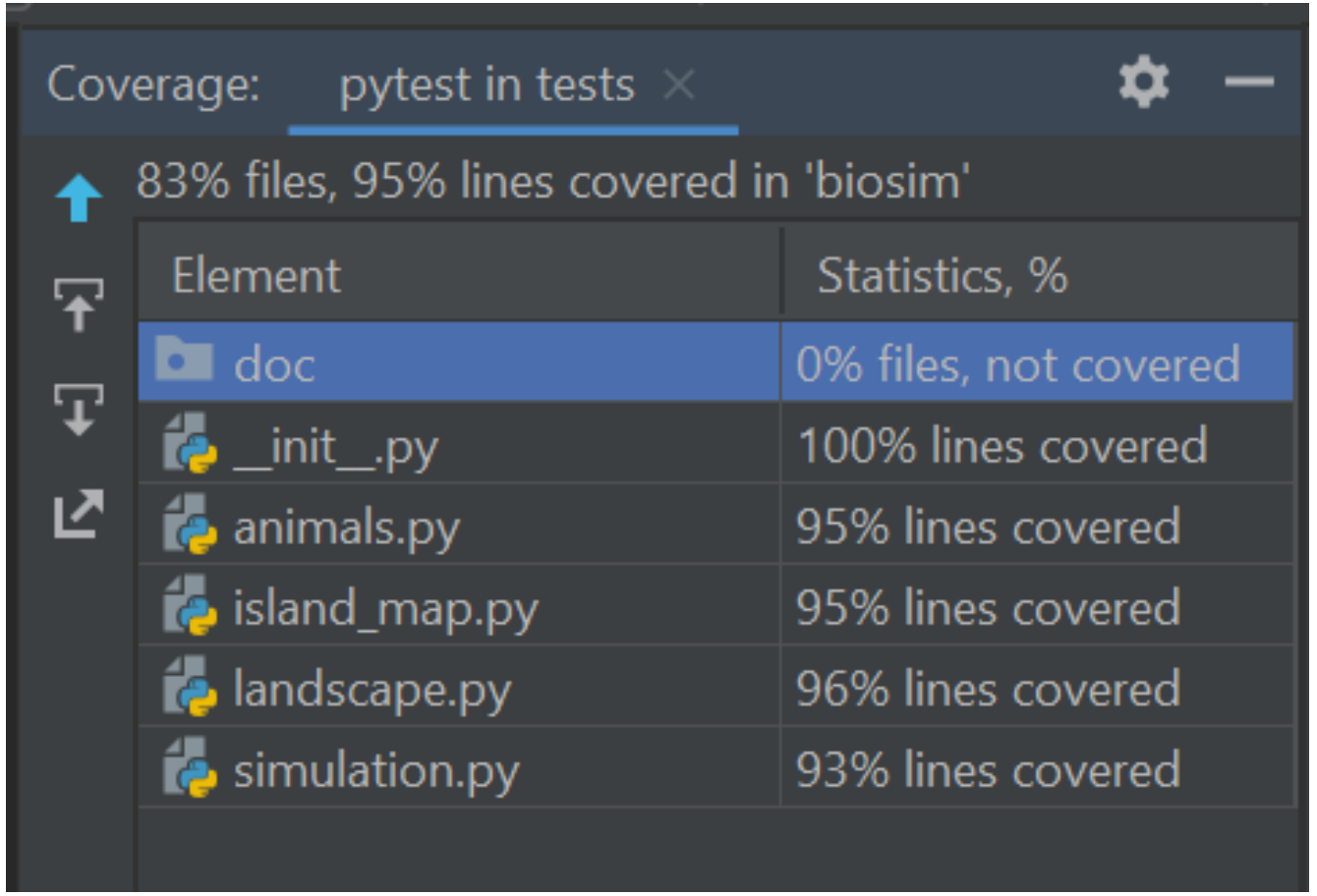






check_sim.py med Rossumøyas kart og vis_years=5

‘Test driven development’ ga høy coverage



Før optimisering var koden veldig treg

Statistics | Call Graph

Name	Call Count	Time (ms)	Own Time (ms)
sort_herb_population_by_fitness	358800	205546 50,1 %	138802 33,8 %
find_fitness	16156182	102395 25,0 %	102395 25,0 %
<method 'random_sample' of 'mtrand.RandomState' ob	16389177	12684 3,1 %	12684 3,1 %
neighbours_of_current_cell	2179467	13176 3,2 %	12023 2,9 %
kill	9557252	19295 4,7 %	7833 1,9 %
<built-in method builtins.input>	1	6730 1,6 %	6730 1,6 %
<method 'normal' of 'mtrand.RandomState' objects>	1929860	6079 1,5 %	6079 1,5 %
prob_kill	9557252	5125 1,2 %	5125 1,2 %
eat	304200	24232 5,9 %	4922 1,2 %
<built-in method numpy.core.multiarray.array>	4403525	4900 1,2 %	4900 1,2 %
prob_death	2390983	21573 5,3 %	4823 1,2 %
<method 'set_text' of 'matplotlib.ft2font.FT2Font' object	41419	4287 1,0 %	4287 1,0 %

check_sim.py inkl. visualisering

Etter endring fra numpy.exp til math.exp, og fra Bubble- til Lambdasortering var den litt raskere

Statistics | Call Graph

Name	Call Count	Time (ms)	Own Time (ms)
<built-in method builtins.input>	1	65094 28,1 %	65094 28,1 %
find_fitness	16156182	29281 12,6 %	23879 10,3 %
<method 'random_sample' of 'mtrand.RandomState' ob	16389177	8604 3,7 %	8604 3,7 %
neighbours_of_current_cell	2179467	8366 3,6 %	7600 3,3 %
<method 'set_text' of 'matplotlib.ft2font.FT2Font' objec	59394	6208 2,7 %	6208 2,7 %
kill	9557252	13460 5,8 %	6069 2,6 %
<built-in method math.exp>	33500544	5615 2,4 %	5615 2,4 %
<built-in method numpy.core.multiarray.array>	4584609	4178 1,8 %	4154 1,8 %
<method 'normal' of 'mtrand.RandomState' objects>	1929860	4107 1,8 %	4107 1,8 %
eat	304200	17342 7,5 %	3869 1,7 %
sort_herb_population_by_fitness	358800	26701 11,5 %	3568 1,5 %
move_single_animal	2551286	37816 16,3 %	2550 1,1 %
prob_kill	9557252	2481 1,1 %	2481 1,1 %
<built-in method numpy.core.multiarray.concatenate>	1210437	2306 1,0 %	2306 1,0 %
<built-in method builtins.sorted>	419071	3633 1,6 %	2287 1,0 %

check_sim.py inkl. visualisering

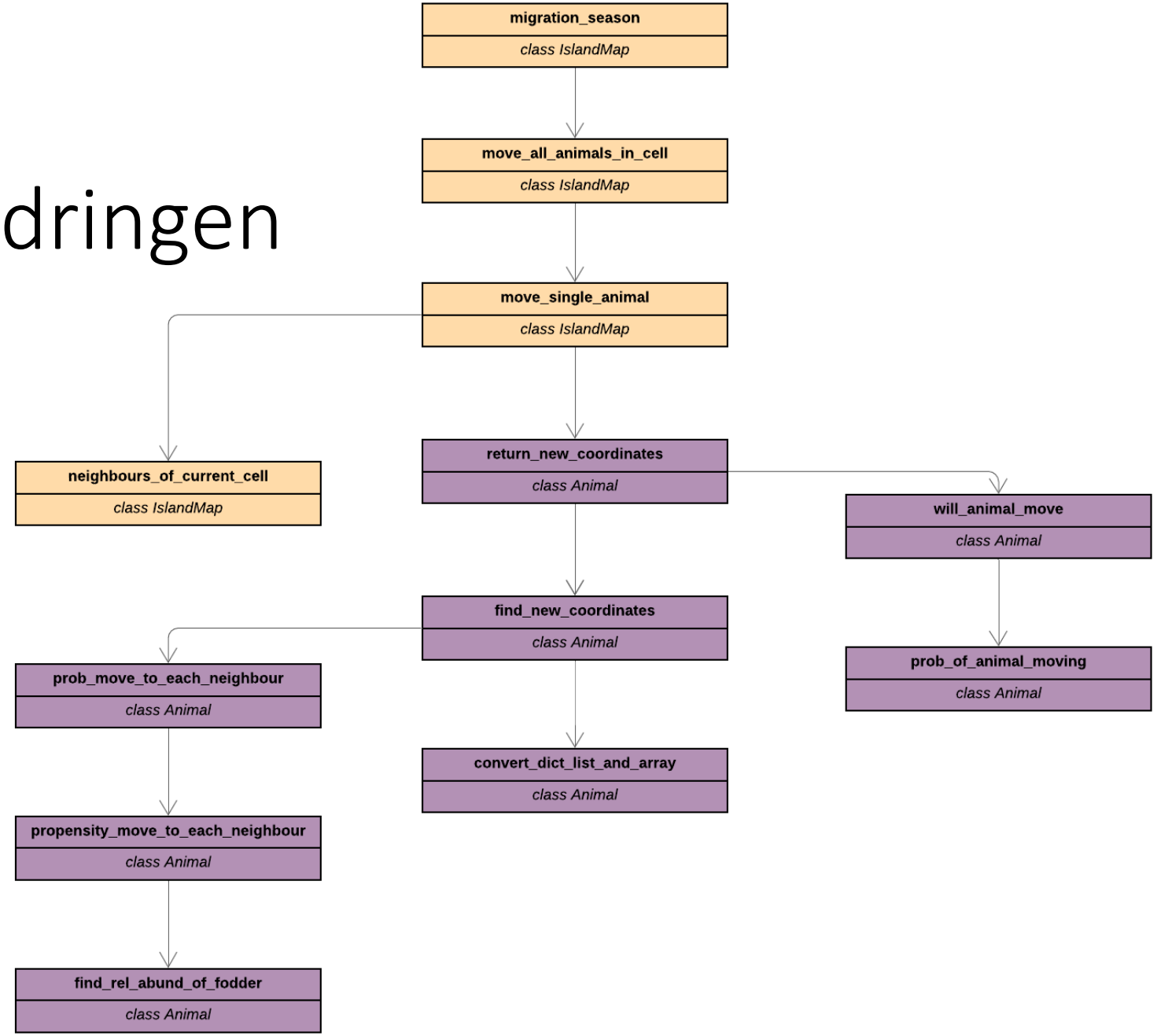
Reduksjon i antall beregninger av fitness ga enda raskere kode

Statistics | Call Graph

Name	Call Count	Time (ms)	Own Time (ms)
<method 'random_sample' of 'mtrand.RandomState' ob	16533032	12706 5,8 %	12706 5,8 %
find_fitness	4771429	14675 6,7 %	12117 5,5 %
neighbours_of_current_cell	2066445	12465 5,7 %	11424 5,2 %
<built-in method builtins.input>	1	10301 4,7 %	10301 4,7 %
kill	9995202	18591 8,4 %	8340 3,8 %
<method 'set_text' of 'matplotlib.ft2font.FT2Font' objec	59487	8175 3,7 %	8175 3,7 %
<method 'normal' of 'mtrand.RandomState' objects>	1853424	6864 3,1 %	6864 3,1 %
<built-in method numpy.core.multiarray.array>	4430051	6197 2,8 %	6167 2,8 %
attempt_eating_all_herbivores_in_cell	337677	24159 11,0 %	5345 2,4 %
move_single_animal	2453034	53363 24,2 %	3625 1,6 %
<built-in method numpy.core.multiarray.concatenate>	1163061	3494 1,6 %	3494 1,6 %
prob_kill	9995202	3409 1,5 %	3409 1,5 %
<built-in method builtins.sorted>	452548	4994 2,3 %	3021 1,4 %
<built-in method math.exp>	10683629	2922 1,3 %	2922 1,3 %
convert_dict_to_list_and_array	318103	16140 7,3 %	2895 1,3 %
add_newborn_animals	54600	24945 11,3 %	2886 1,3 %
birth_process	1853424	20002 9,1 %	2654 1,2 %
prob_give_birth	1853424	6917 3,1 %	2583 1,2 %

check_sim.py inkl. visualisering

Løsning på migrasjonsutfordringen



Struktur for BioSim