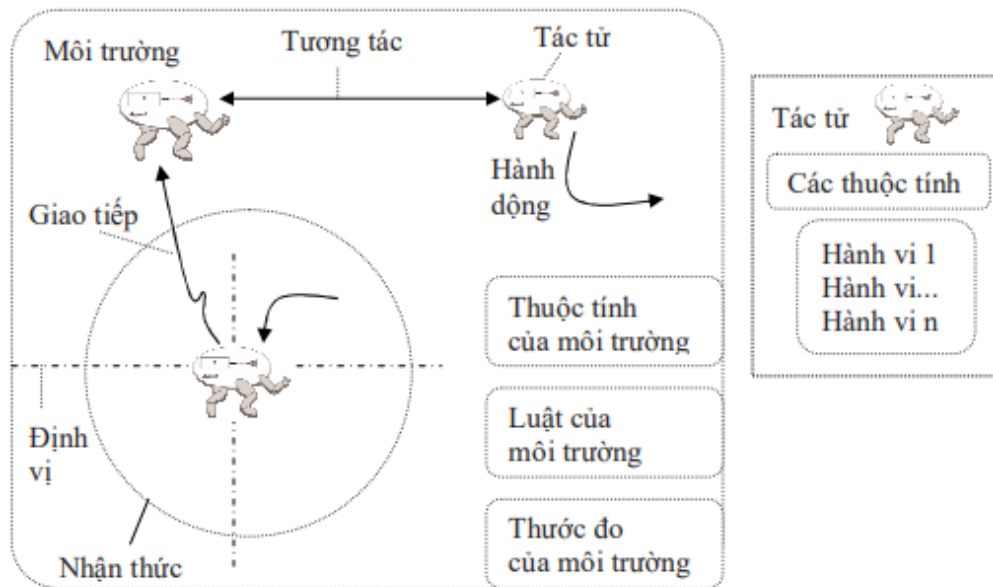# DANH MỤC HÌNH VẼ

Figure 1.1. Perform an agent-oriented simulation
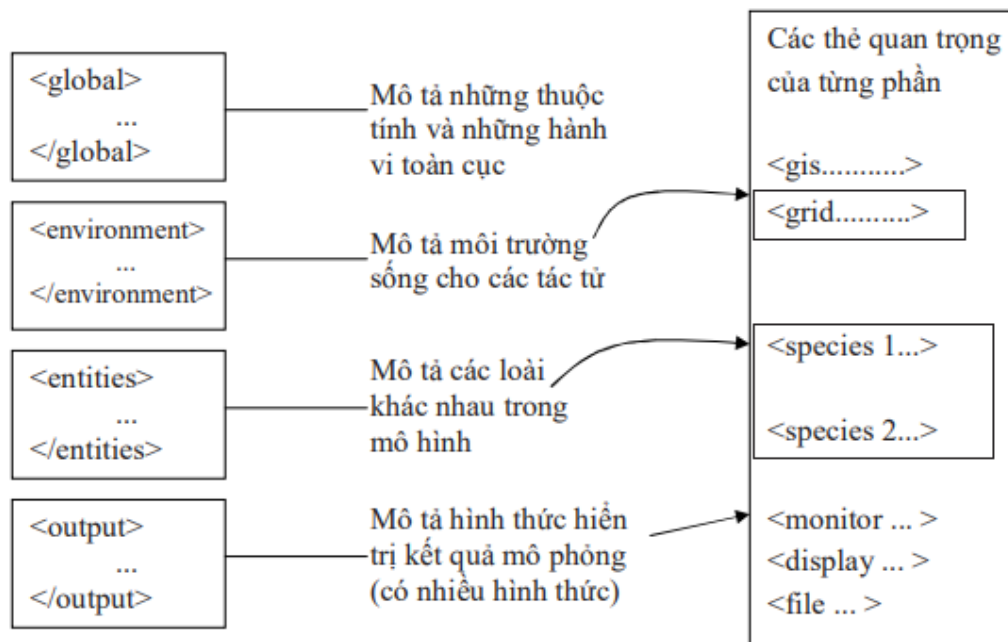

Figure 1.2. Structure of a program written in GAMA
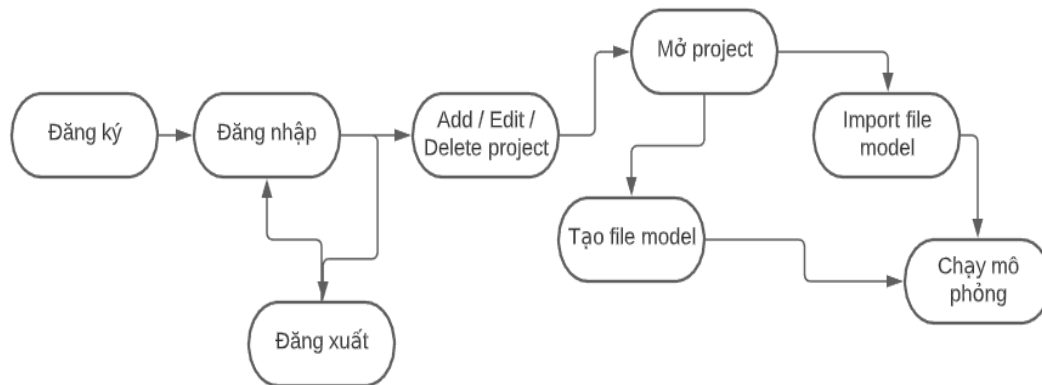
Figure 3.1 Works on the client side

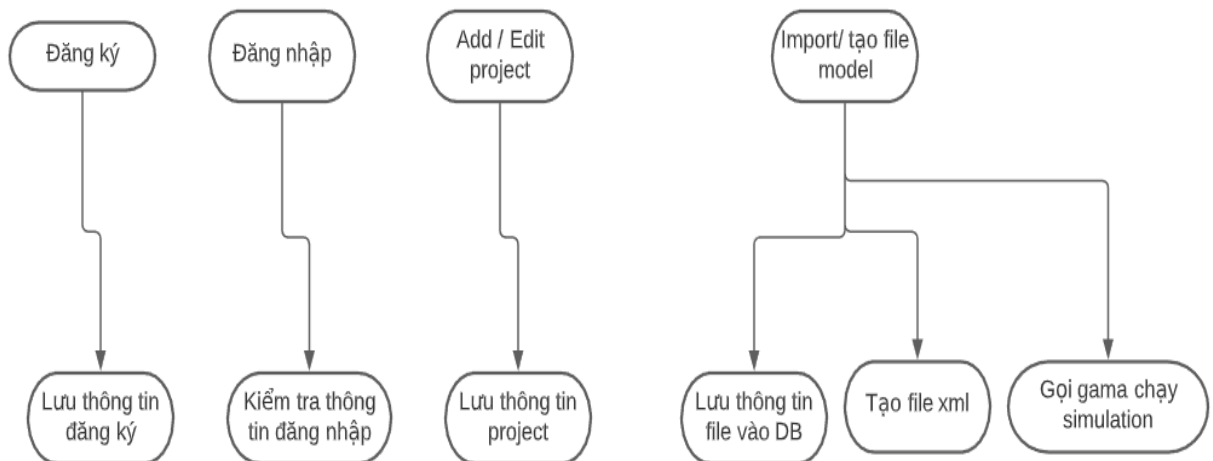*Figure 3.2 Works on the server side*

Figure 3.3. Usecase chart

SignUp / SignIn

User — Website — WebBrowser — Database

User → Website: enter url

Website → WebBrowser: Request homepage

WebBrowser ⇢ Website: load homepage

WebBrowser → Database: get data

User → Website: select signUp / signIn

Database ⇢ WebBrowser: return data

Website → WebBrowser: request page

WebBrowser ⇢ Website: load page

User → Website: signUp

Website → WebBrowser: pass data

WebBrowser → Database: save data

User → Website: signIn

Website → WebBrowser: check data

WebBrowser → Database: validate data

Database ⇢ WebBrowser: return data

WebBrowser ⇢ Website: set logged in
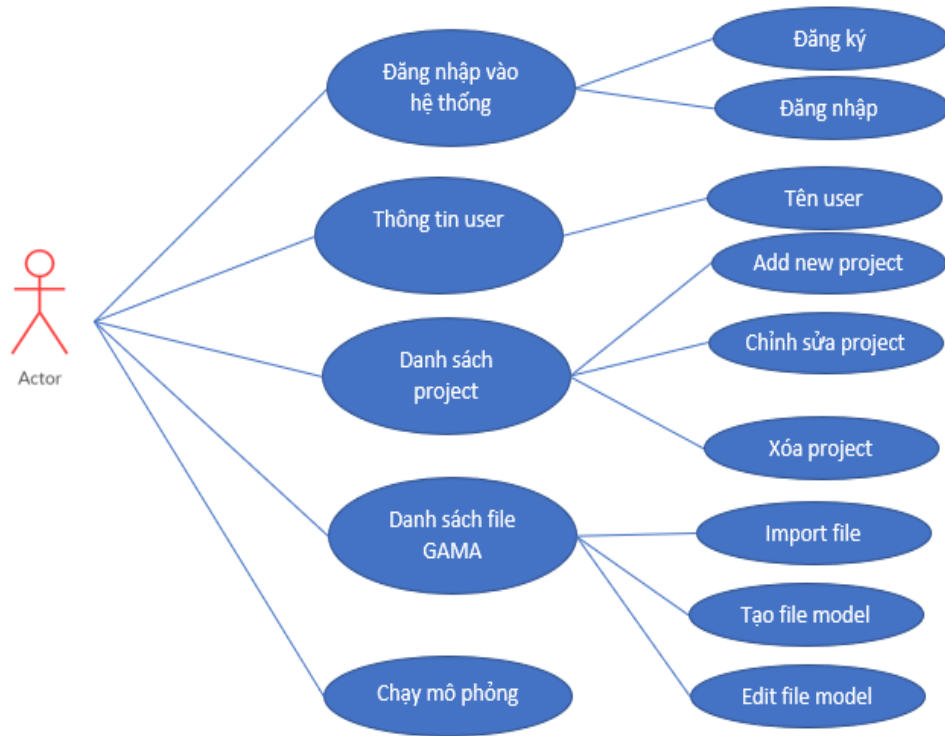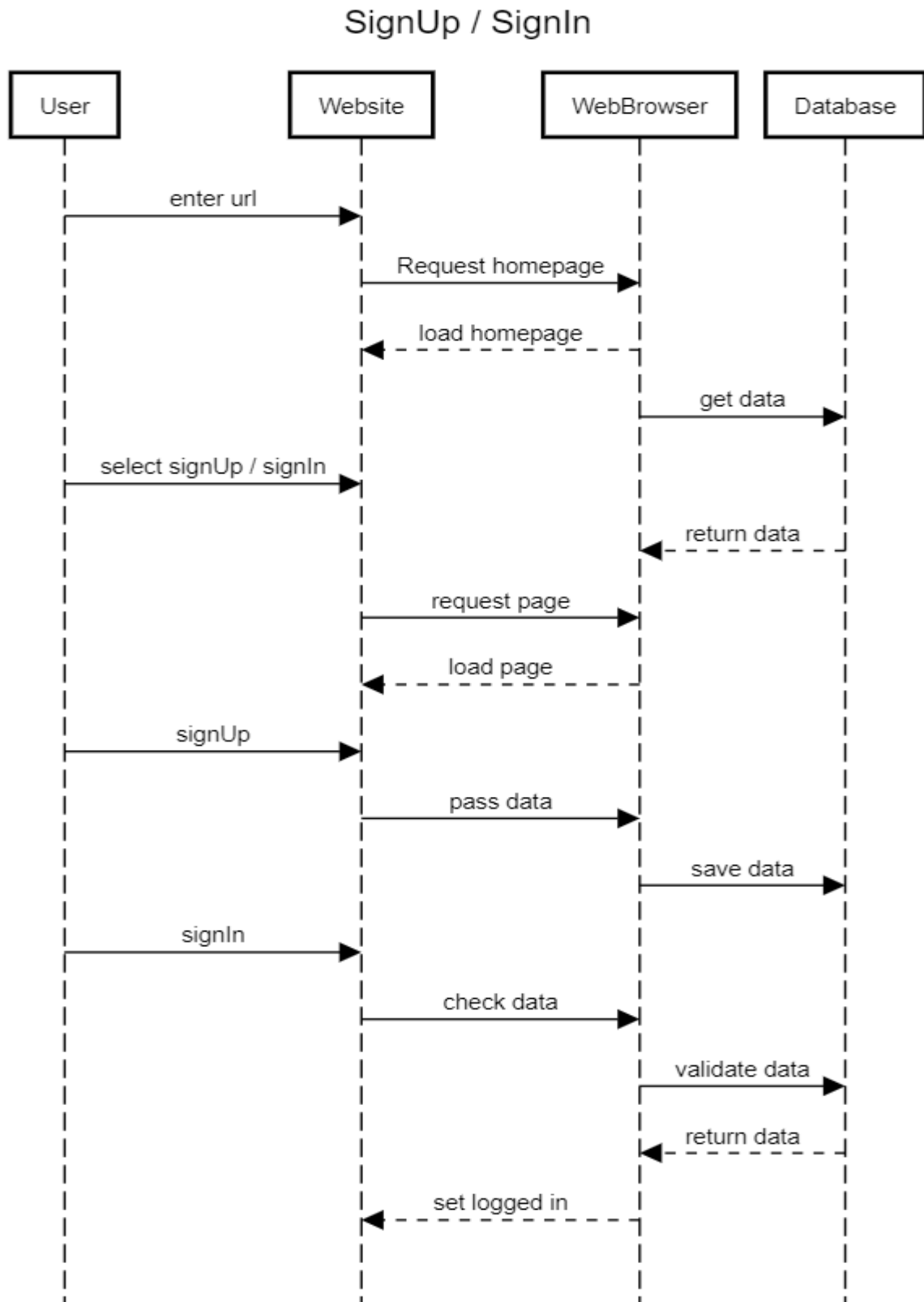
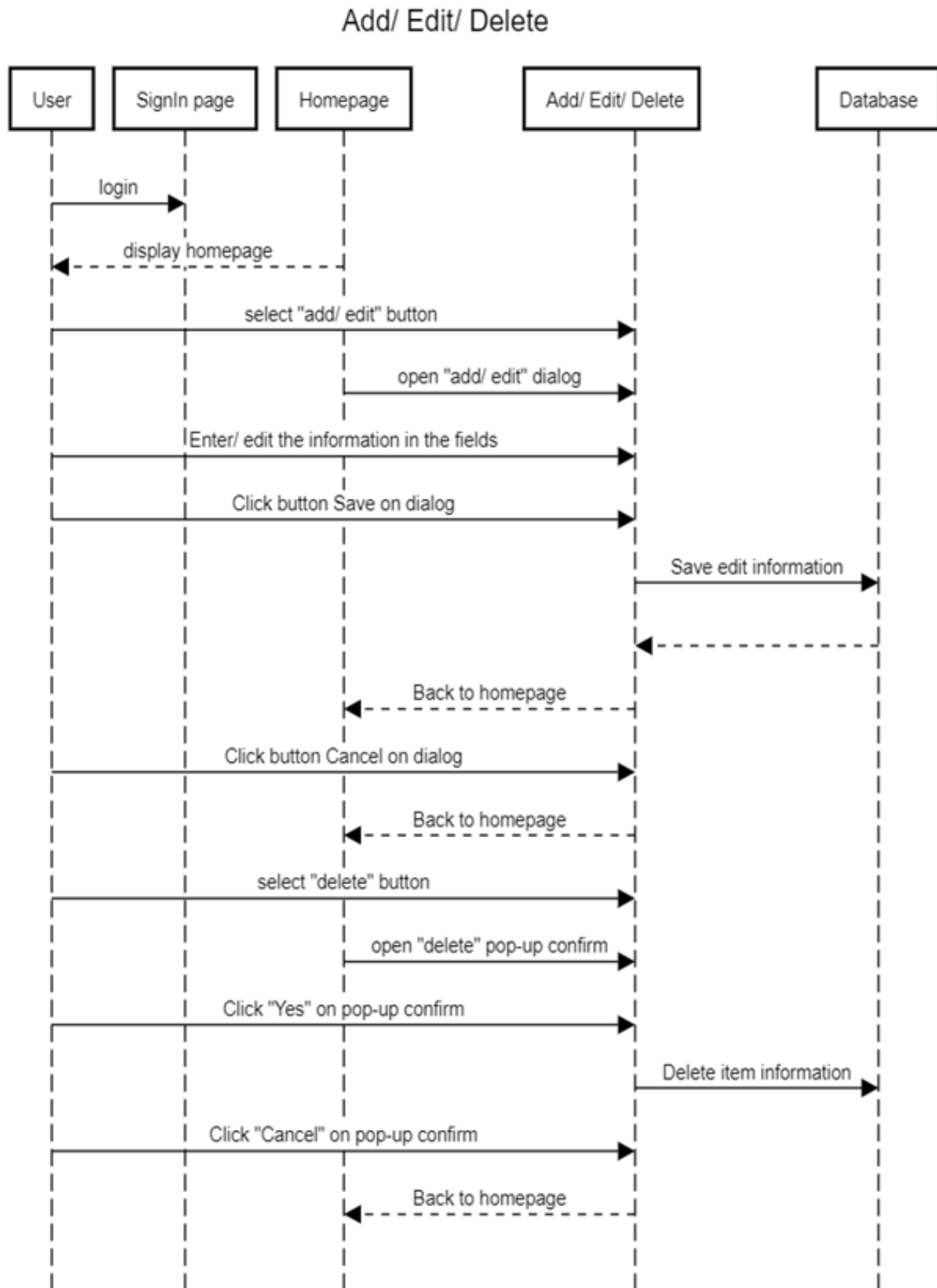*Figure 3.4. Sequence diagram sign in/sign up*

Figure 3.5. Sequence diagram add/edit/delete project
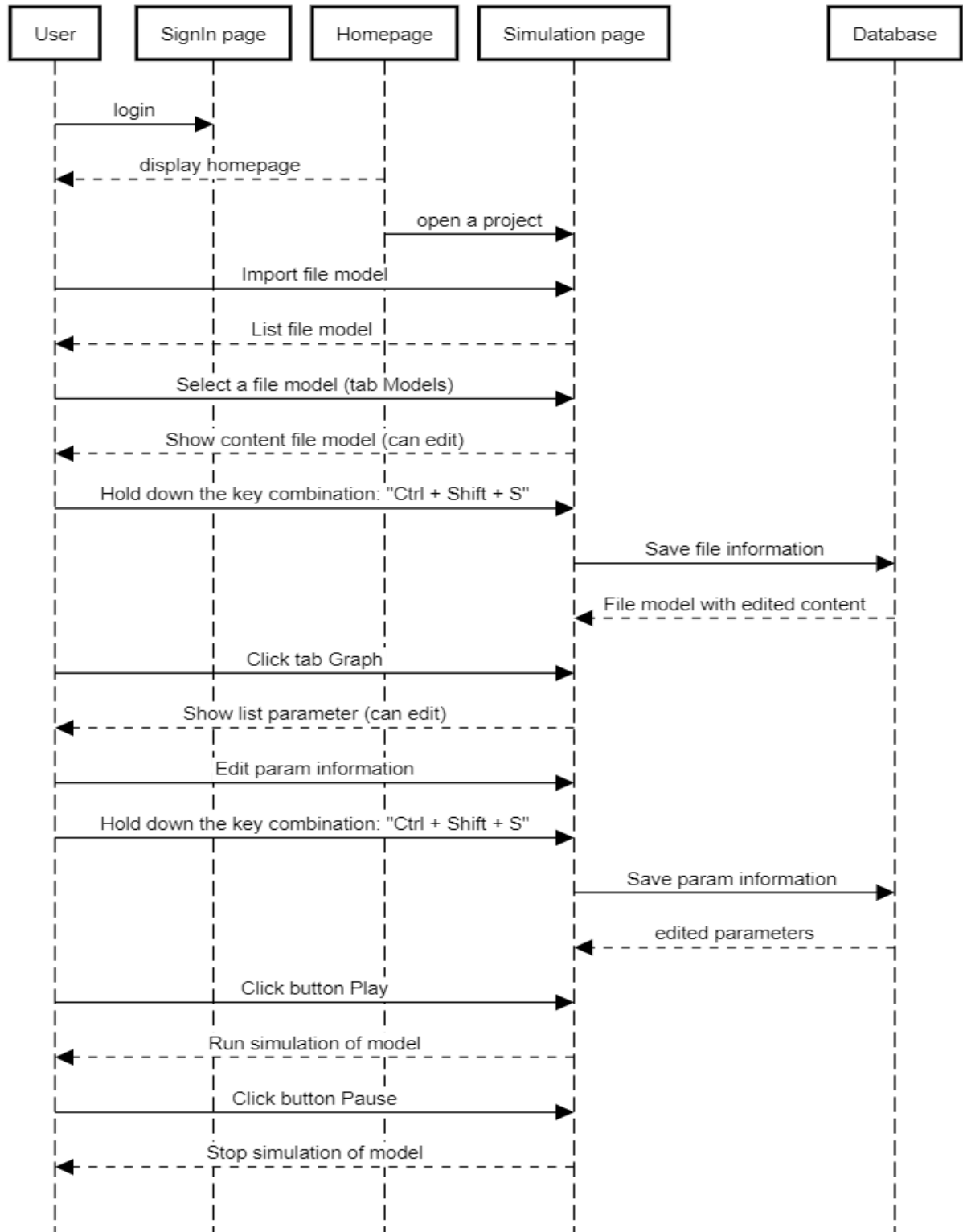
Create and simulation model

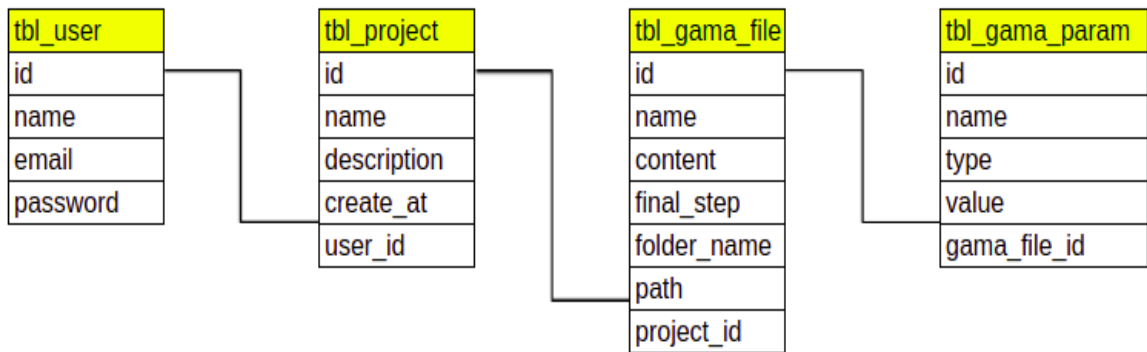*Figure 3.6. Sequence diagram run simulation model*
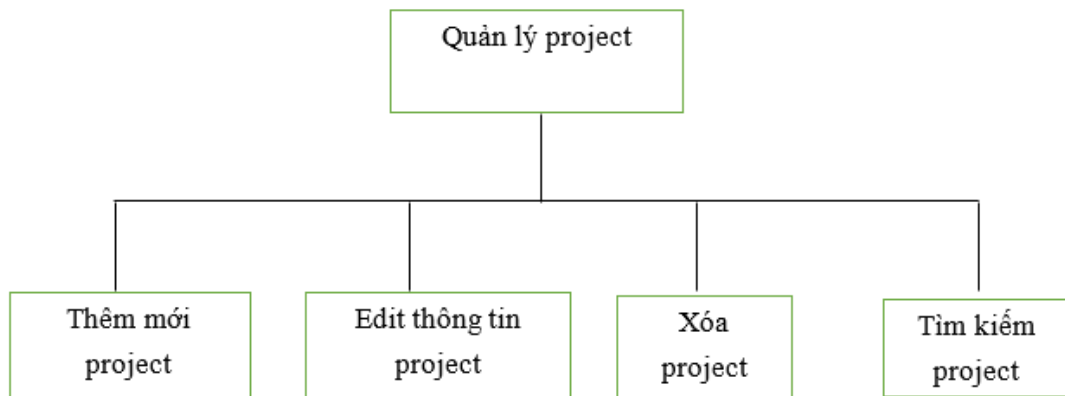
Figure 3.7. Database Schema

Figure 4.8. Project management functions
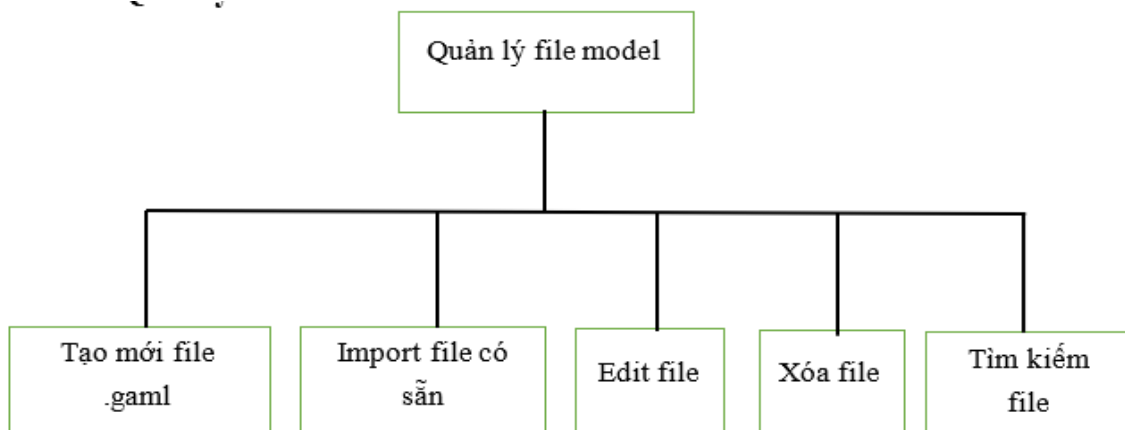

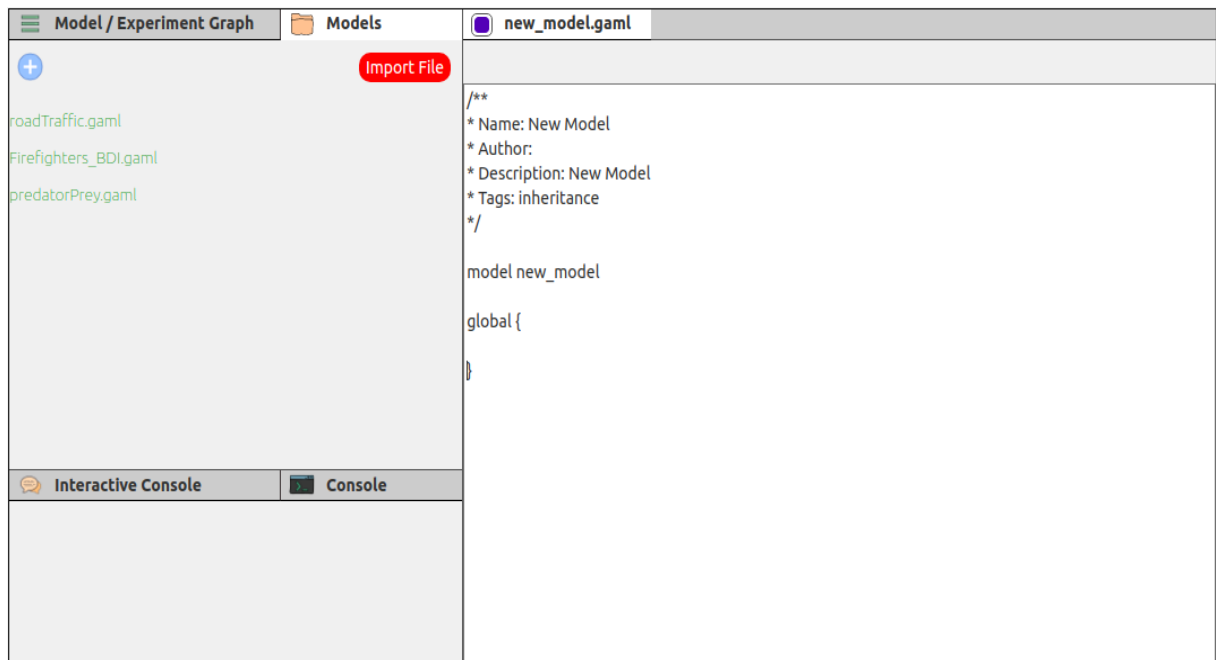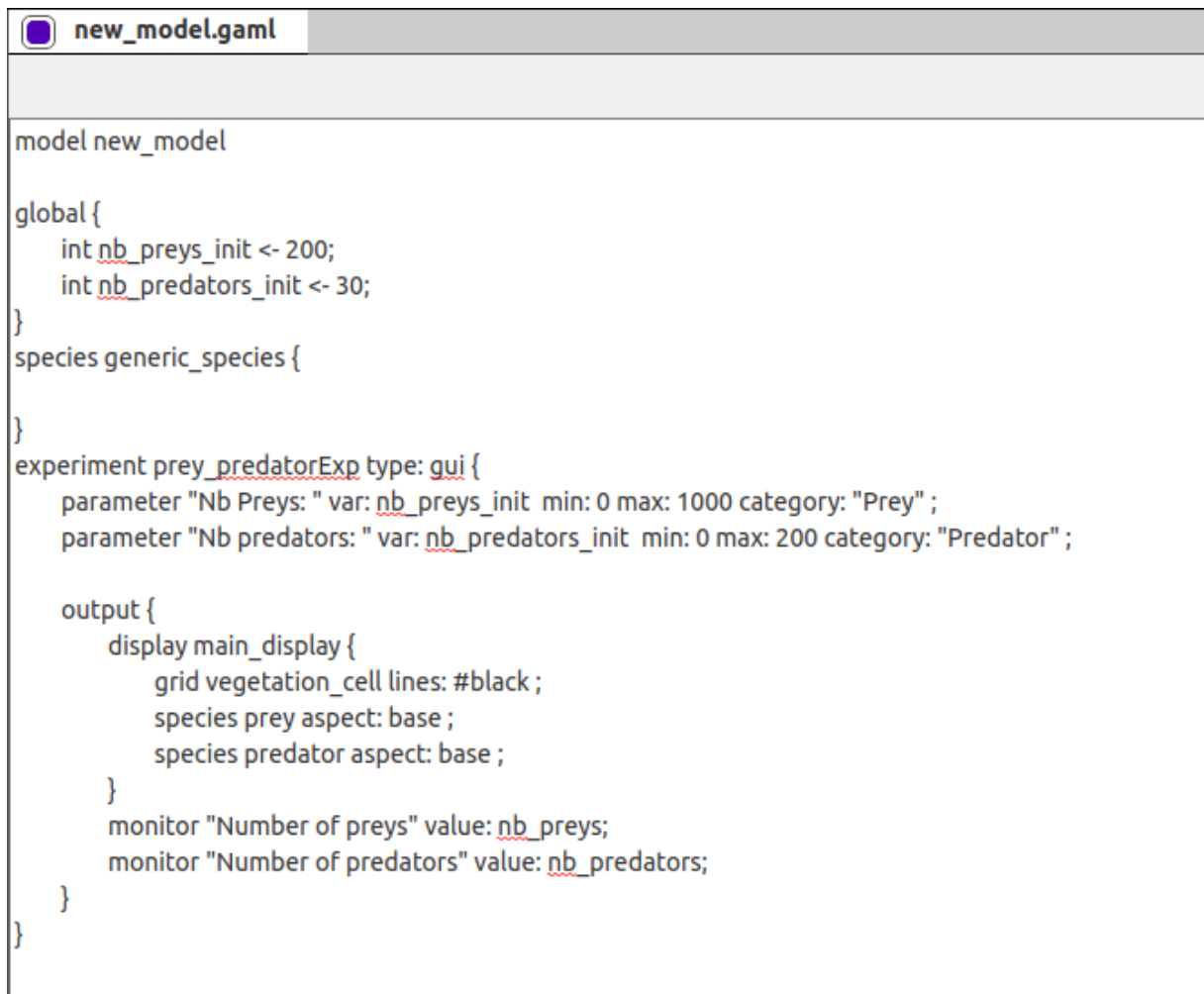*Figure 4.9. Model file management functions*

Figure 4.10. Ways to create model files

```
new_model.gaml

model new_model

global {
    int nb_preys_init <- 200;
    int nb_predators_init <- 30;
}
species generic_species {

}
experiment prey_predatorExp type: gui {
    parameter "Nb Preys: " var: nb_preys_init  min: 0 max: 1000 category: "Prey" ;
    parameter "Nb predators: " var: nb_predators_init  min: 0 max: 200 category: "Predator" ;

    output {
        display main_display {
            grid vegetation_cell lines: #black ;
            species prey aspect: base ;
            species predator aspect: base ;
        }
        monitor "Number of preys" value: nb_preys;
        monitor "Number of predators" value: nb_predators;
    }
}
```

Figure 4.11 Model file editing interface

GAMA-Platform

| Simulation | | Search |

| Model / Experiment Graph | Models | predatorPrey.gaml | map |

Figure 4.12 The interface changes the number of simulation steps

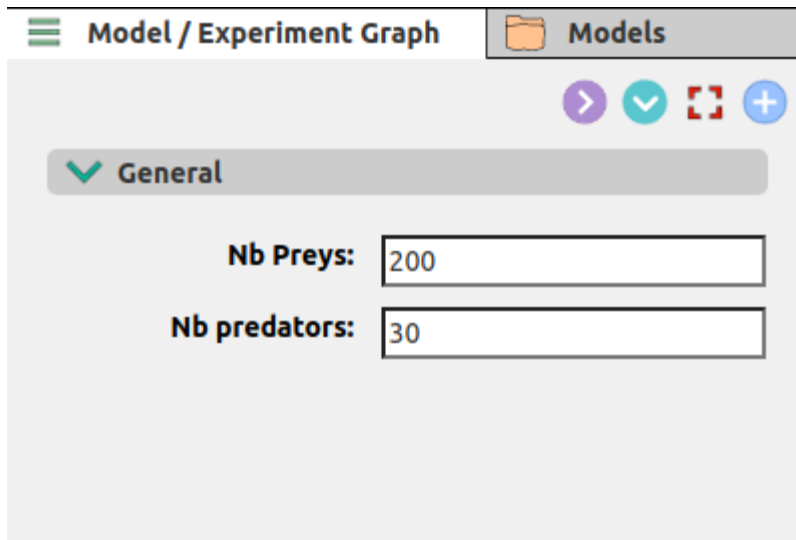*Figure 4.13. The interface changes parameter values*

```xml
<?xml version="1.0" encoding="UTF-8"?>
<Simulation id="2" sourcePath="./predatorPrey/predatorPrey.gaml"
finalstep="1000" experiment="predPrey">
  <Parameters>
    <Parameter name="nb_predator_init" type="INT" value="53" />
    <Parameter name="nb_preys_init" type="INT" value="621" />
  </Parameters>
  <Outputs>
    <Output id="1" name="main_display" framerate="10" />
    <Output id="2" name="number_of_preys" framerate="1" />
    <Output id="3" name="number_of_predators" framerate="1" />
    <Output id="4" name="duration" framerate="1" />
  </Outputs>
</Simulation>
```

Figure 4.14. Example file with .xml extension

Figure 4.15. The proxy.conf.json configuration file
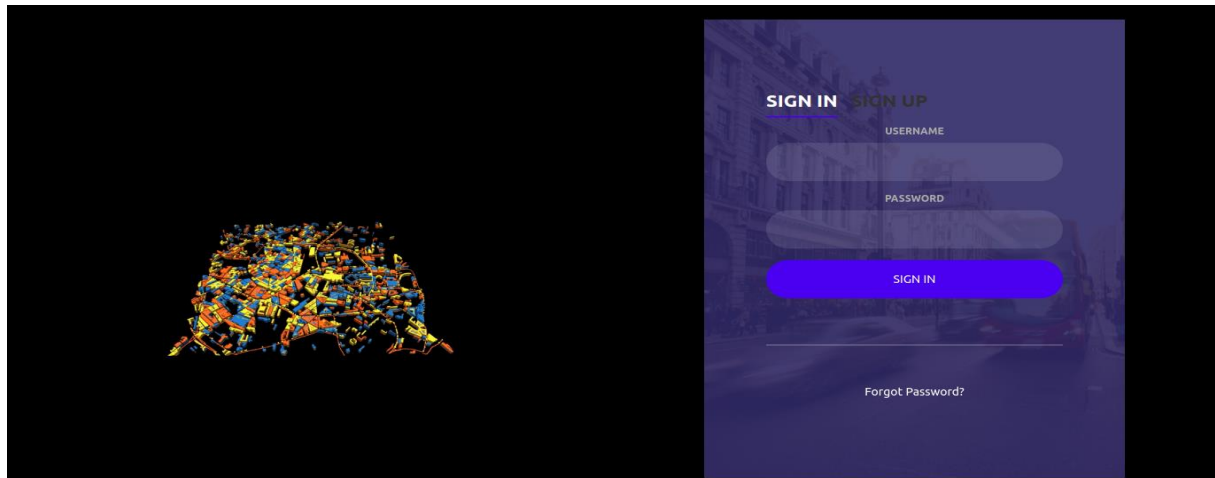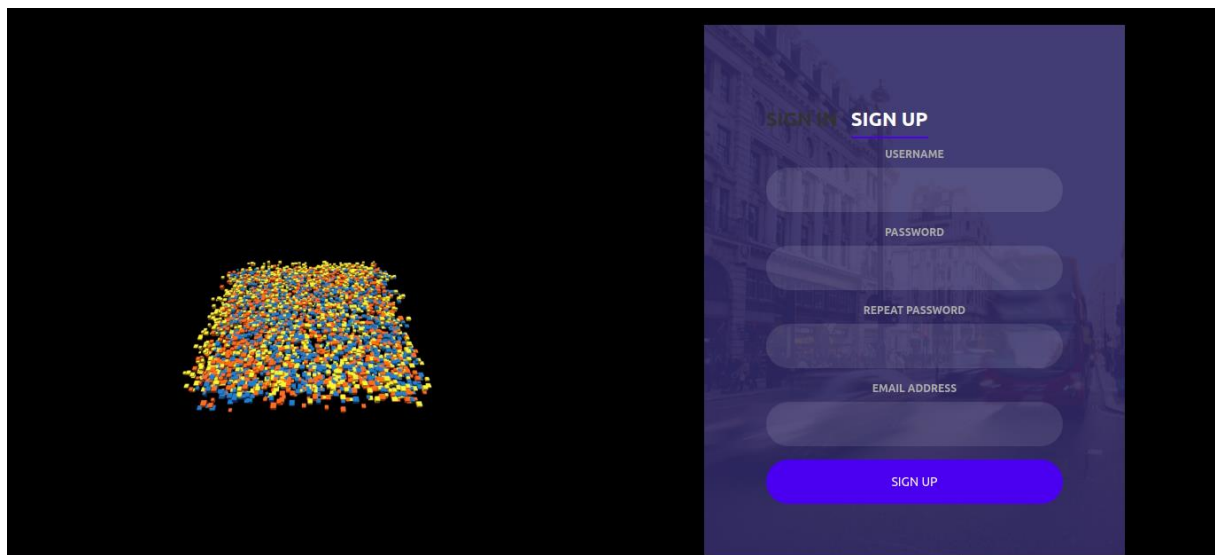
Figure 4.16. Sign in screen
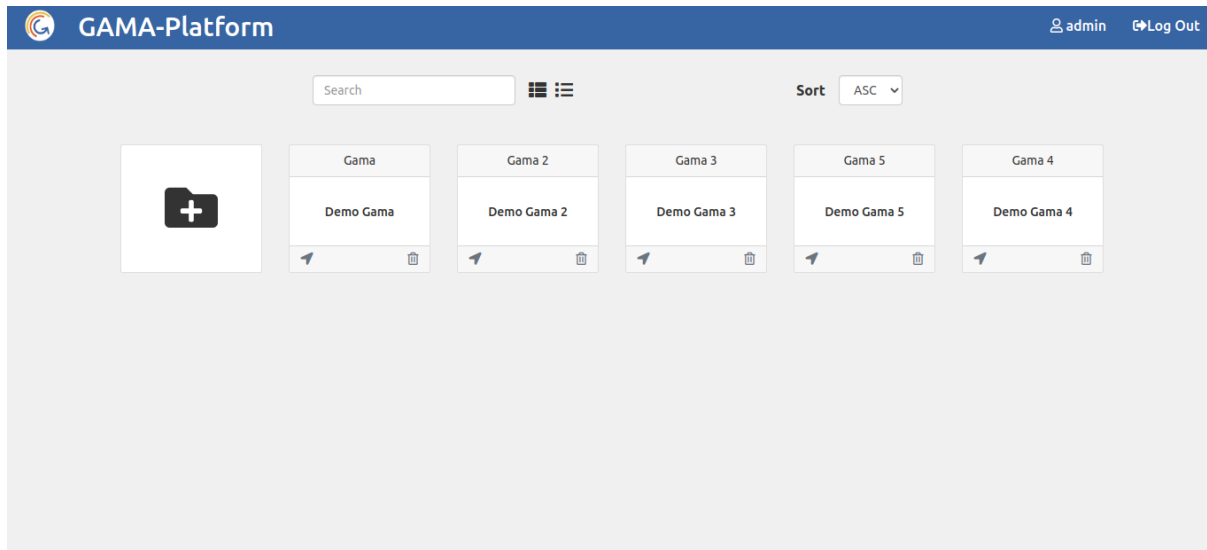

Figure 4.10. Sign up screen
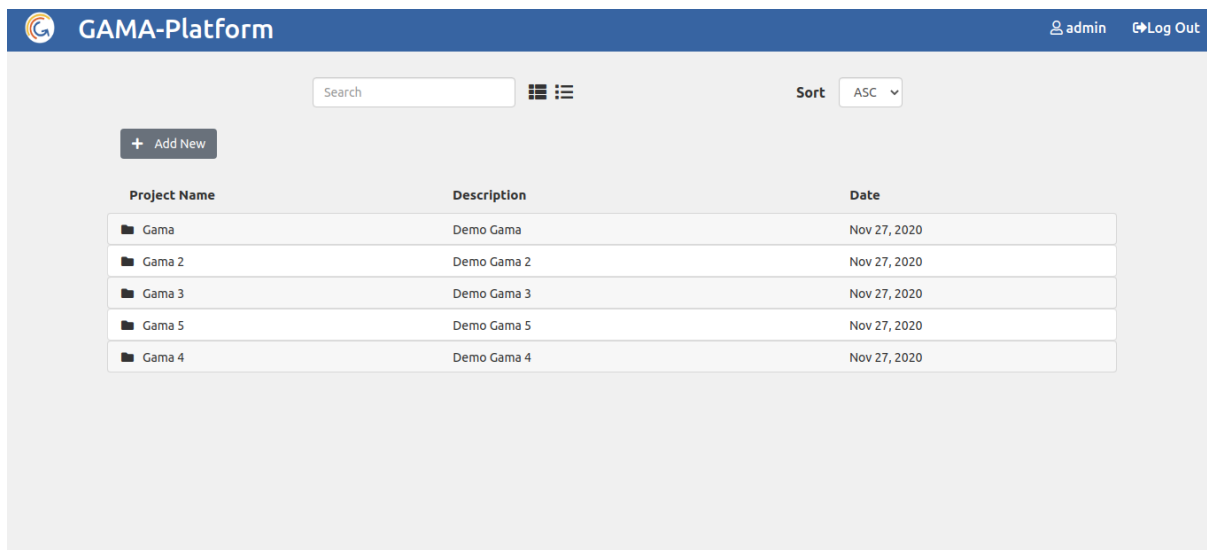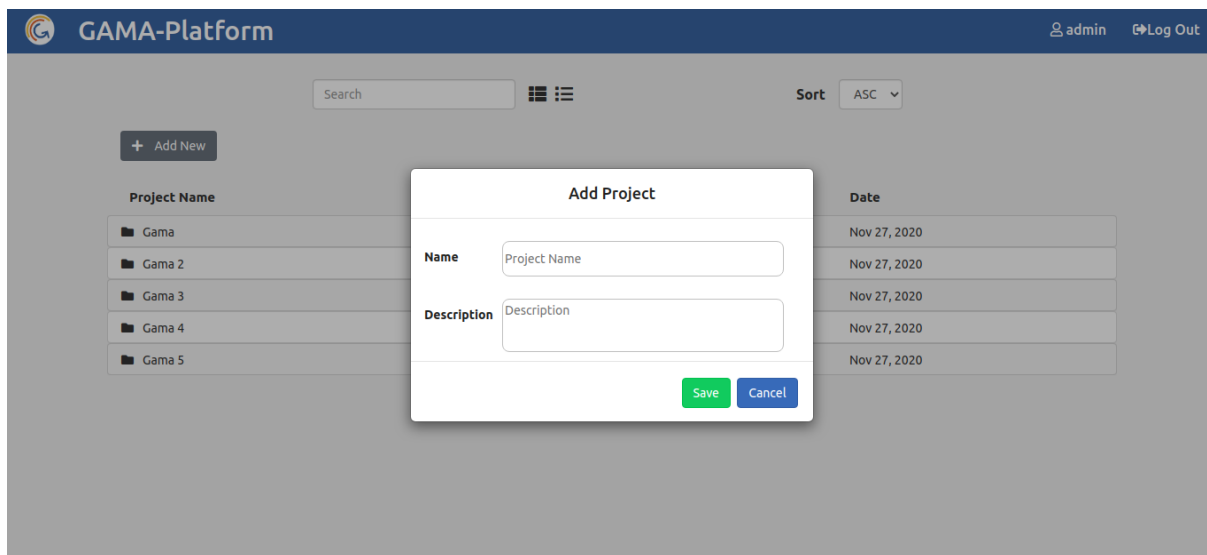
Figure 4.17 Project screen (folder type)

Figure 4.18. Project screen (list type)
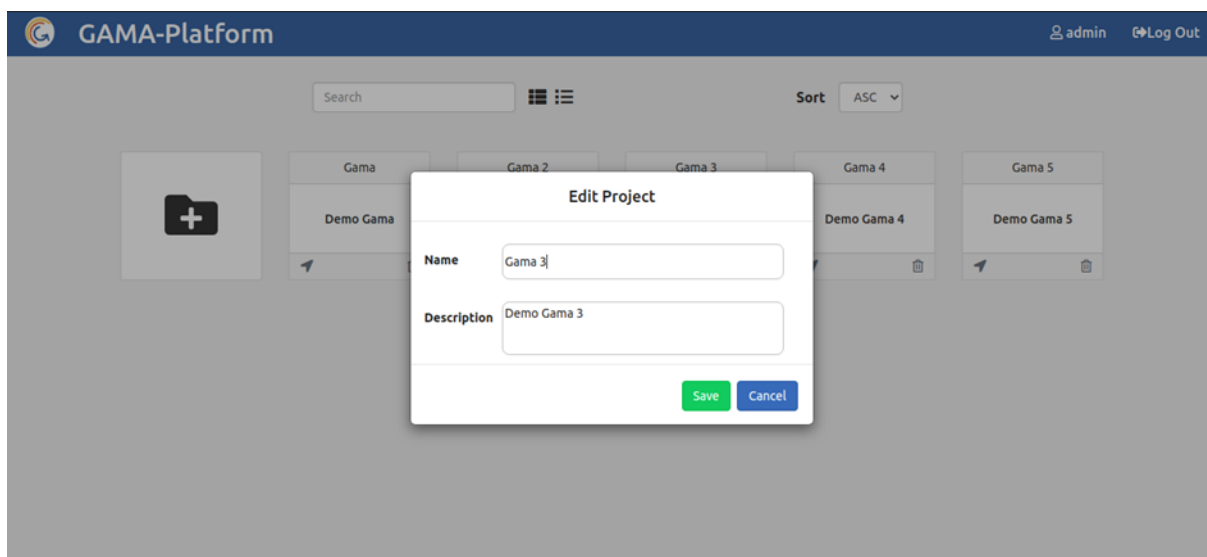
Hình 4.19. Dialog add new project
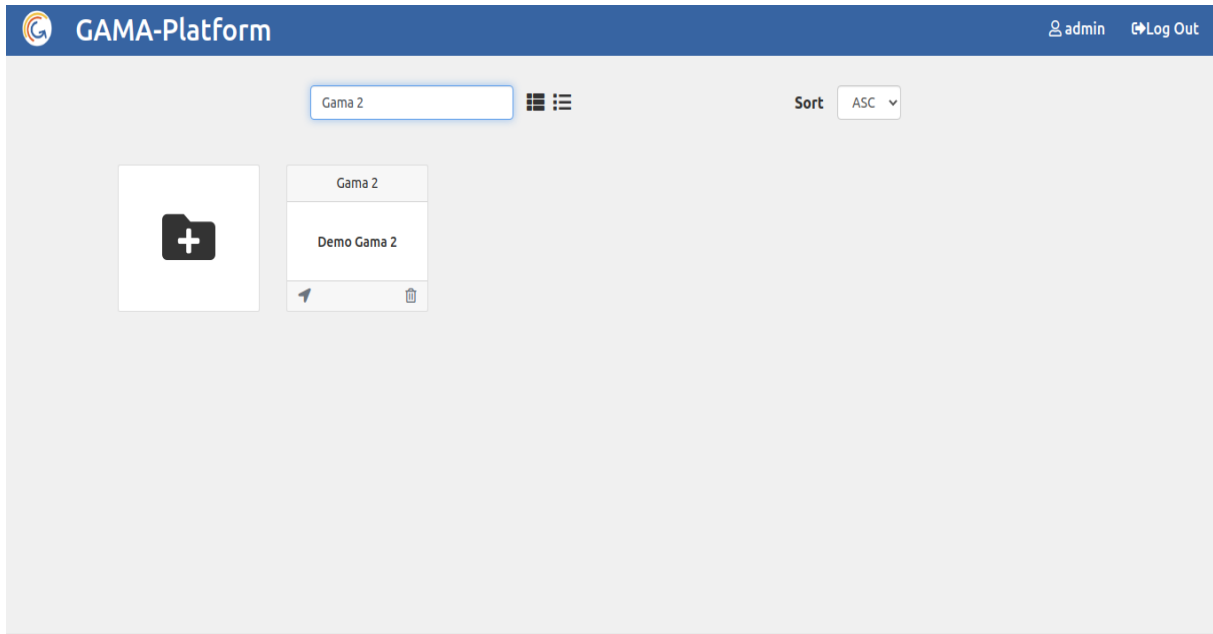

Figure 4.20 Dialog edit project

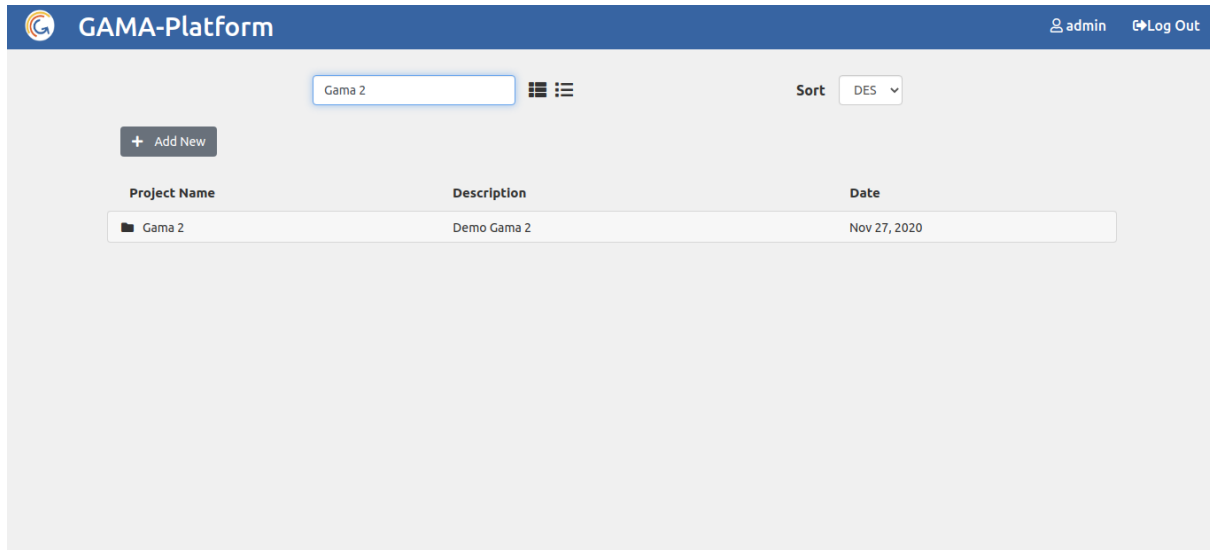*Figure 4.15. Search by project name (folder type)*
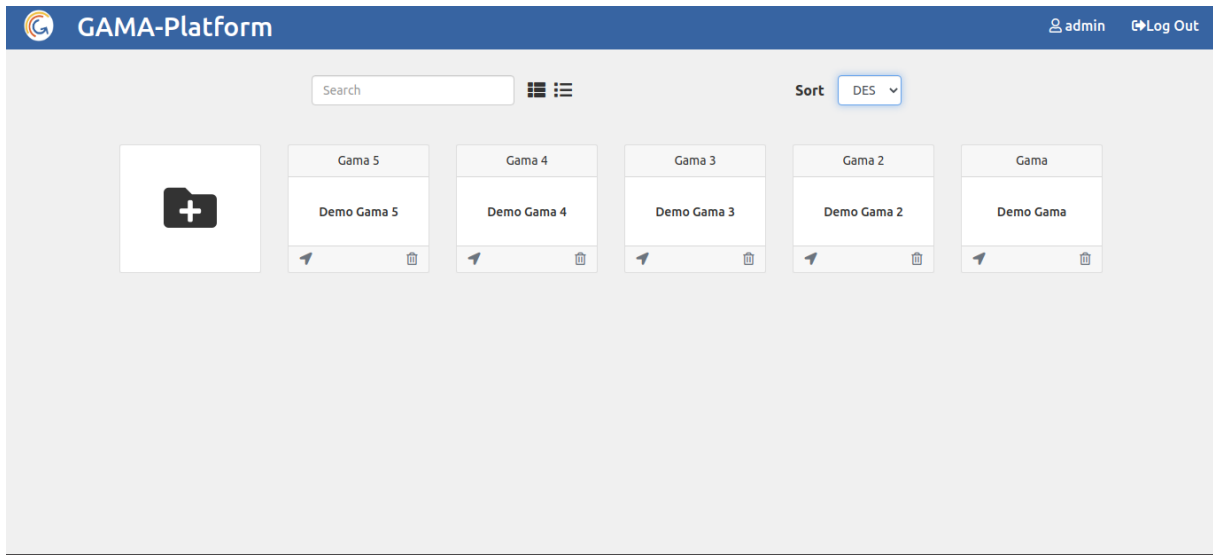

Figure 4.16. Search by project name (list type)

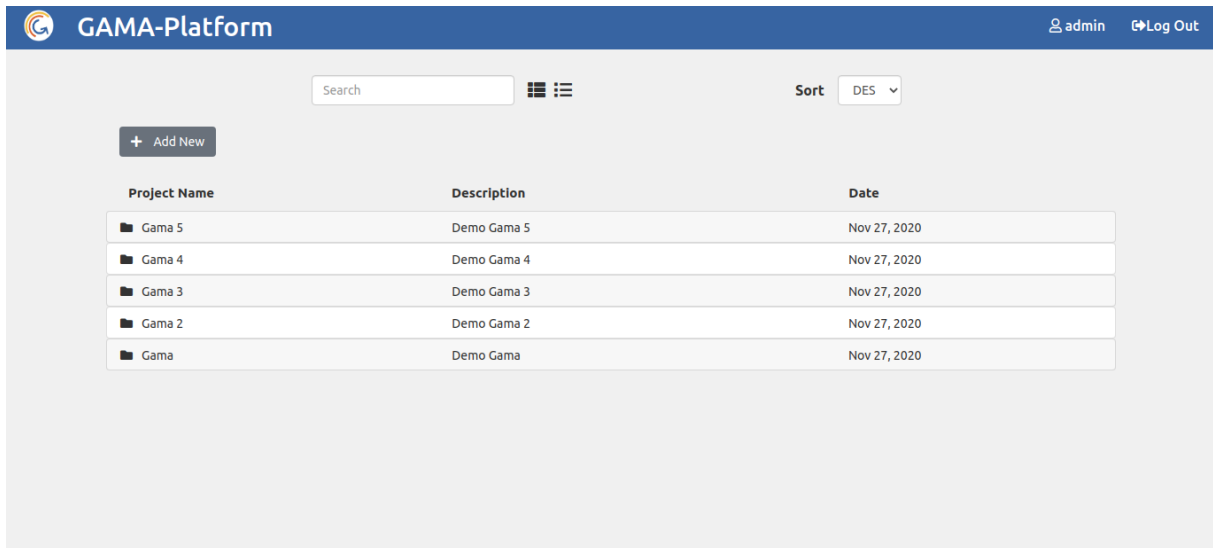*Figure 4.17. Sort by project name (folder type)*

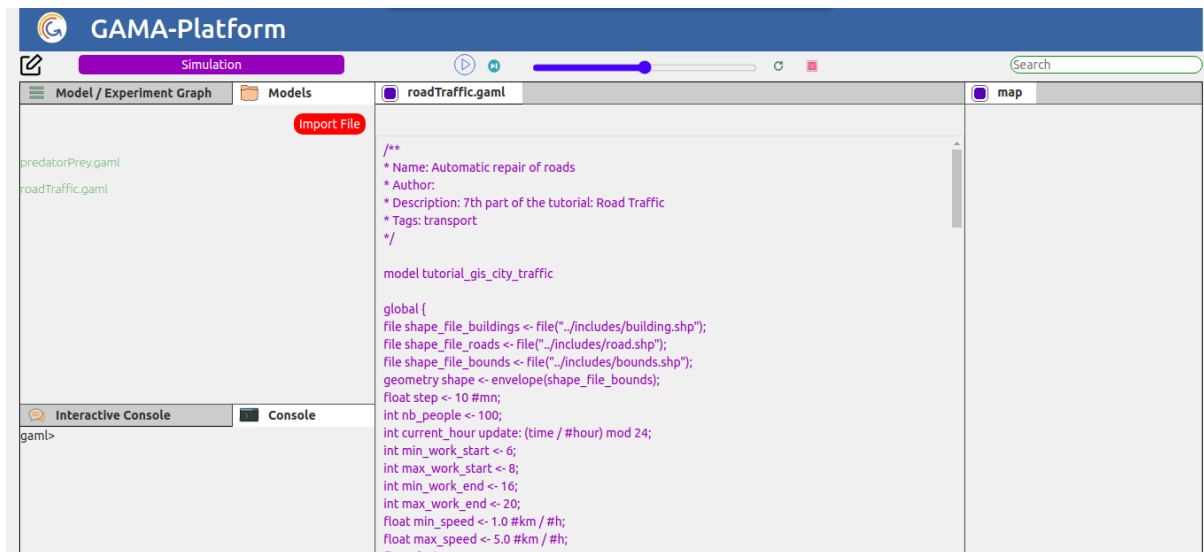

Figure 4.18. Sort by project name (list type)

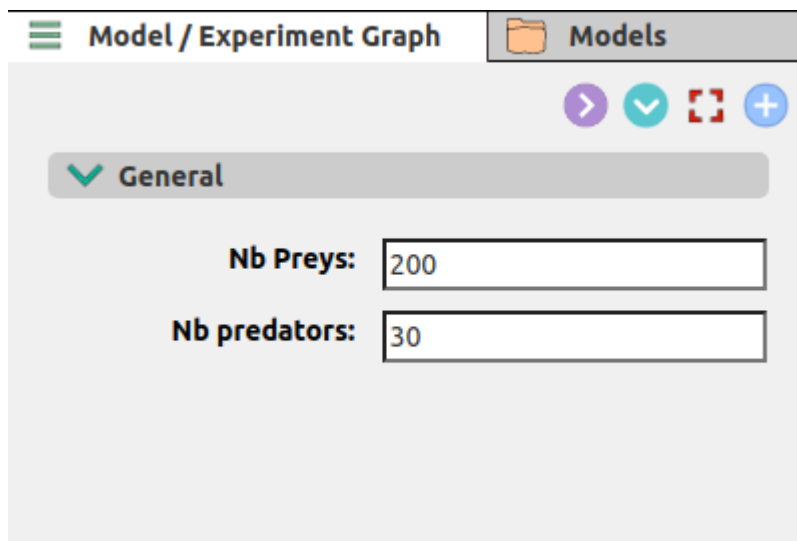*Figure 4.21 The interface add new / edit model file*

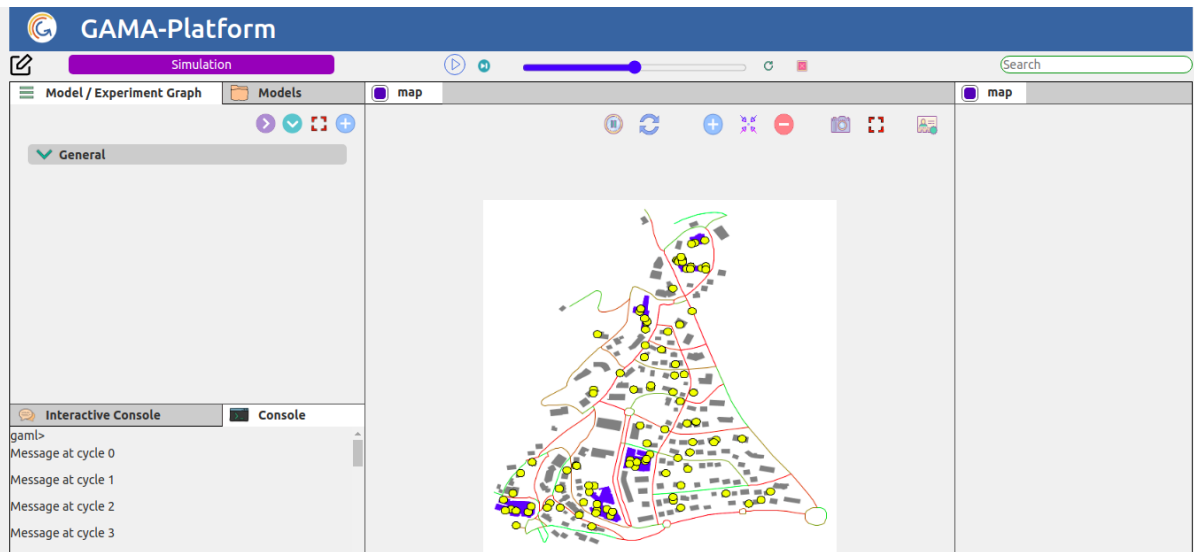*Figure 4.20. Edit the values of the parameters*

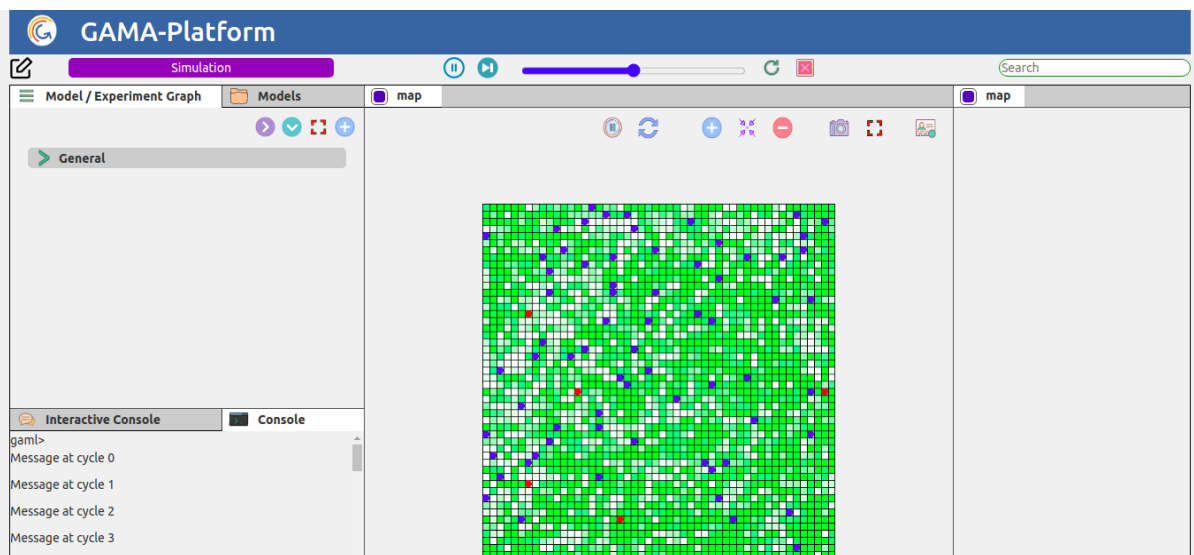*Figure 4.21. The interface running simulation (1)*

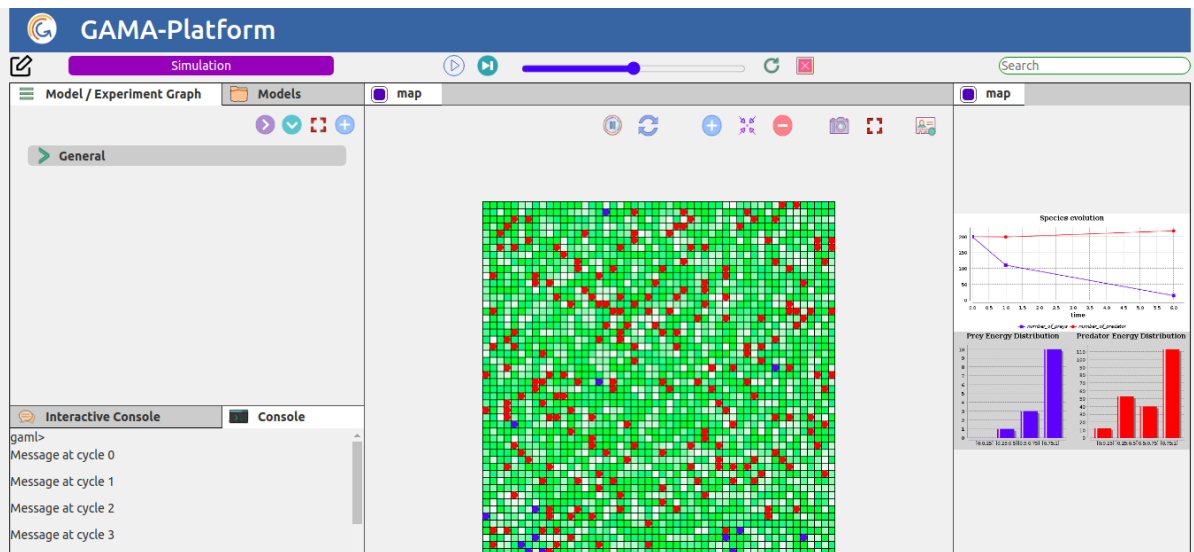*Figure 4.22. The interface running simulation grid(2)*
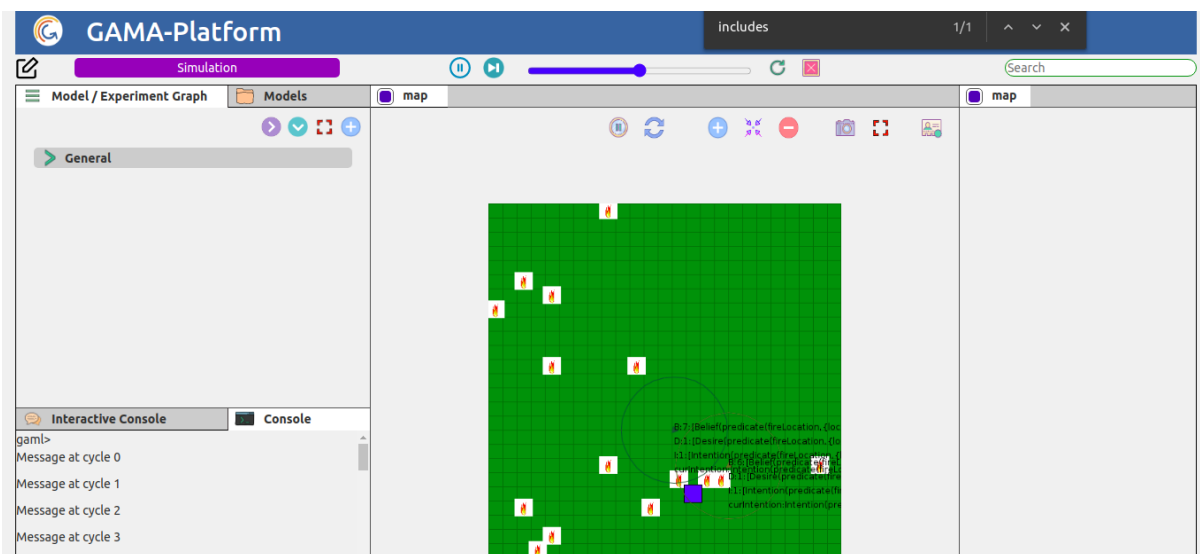
Figure 4.23. The interface running simulation graph(3)

Figure 4.24. The interface running simulation (4)