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Greenfoot in Problem Solving and Artificial Intelligence

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Case Study 1: Problem-solving

Building on some of earlier work of using robots and graphics to teaching and develop Java programming skills.

Greenfoot

Greenfoot (Greenfoot, 2013) is an interactive environment based around Java that enables two-dimensional graphical games and simulations to be set-up relatively simply.

free software (under a GPL licence) and is multiplatform.

Why?

- The students focus on the problem solving aspects.
- The software is free and multiplatform - enables the students to download and run the software on their own machines.
- It is java-based.

Approach

The problems set were gradually increasing in difficulty but only up to a set level.

Guided solutions to the problems are designed take students up to a basic level

Task have built in extra challenges to encourage those students further along with sign-posting to extra resources.



Case Study 2: Problem-solving Assignment

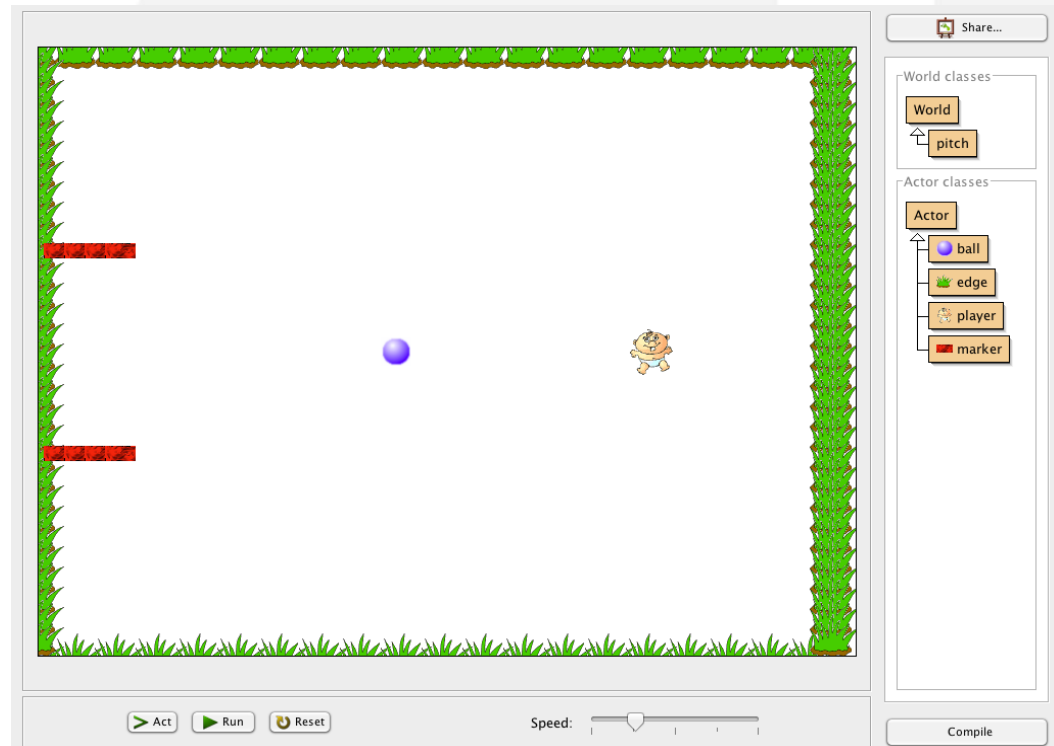
Previous assignment in problem-solving part of the module have involved robots (Turner and Hill, 2008; Turner and Hill, 2010).

Problem raised by the students, robots were not always available when they wanted them.

Case Study 2: Problem-solving Assignment

The assignment approach has been changed to be a Greenfoot based assignment, in part from that feedback. Allows students to focus on task without being distracted on how this image interacts with another or how to layout the icons on the screens; these skills will be taught, developed and assessed later in the module.

- Basic -based on material done in class.
- Intermediate - based on material class but needs modification
- Advanced – to extend the scenario but to bring their own ideas.



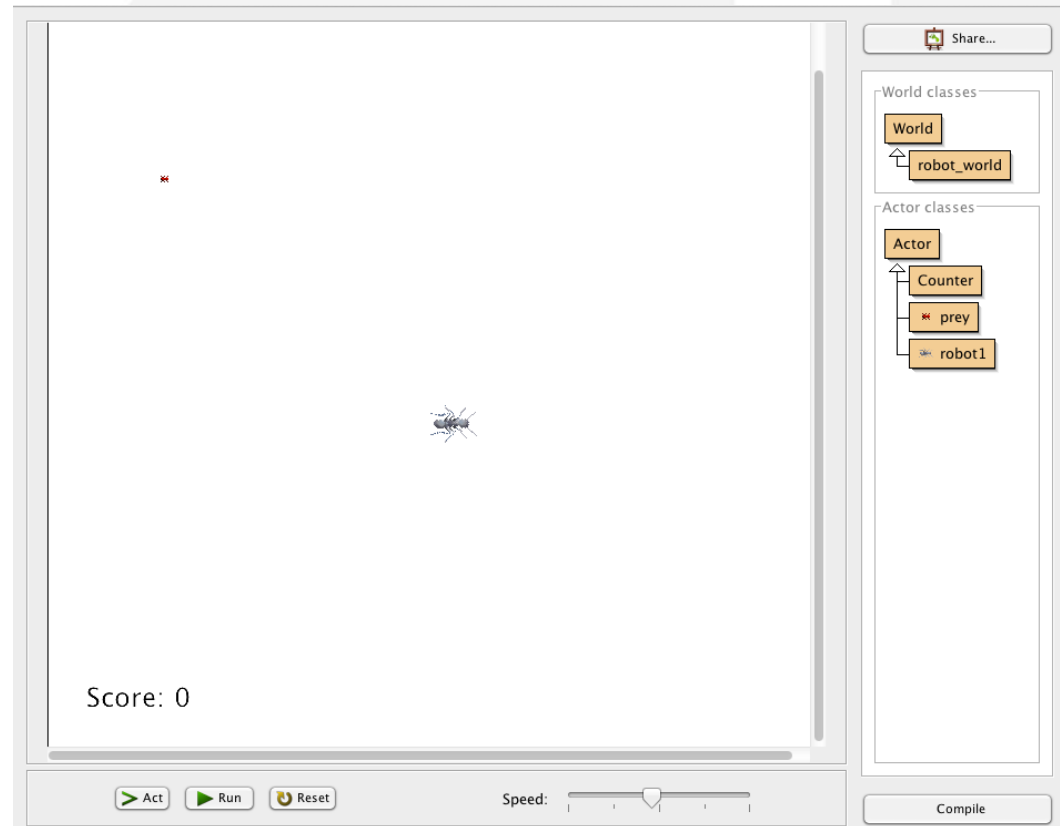
Case Study 3: Artificial Intelligence

In a similar way to Case study 2, Greenfoot has been used within an assignment, mostly for the students can concentrate on coding their solution without having to focus on how to make the various parts move.

- The scenario was the 'dumb ant' - a small ant (prey) being hunted by a larger ant (predator). The starting point is the prey runs towards the predator controlled by a finite state machine.



- The basic level is to develop to design and implement a finite state machine for the prey
- More advanced levels included the development of a Genetic Algorithm or Neural Network based solution.





Conclusions

Greenfoot's visual nature provides an engaging environment, based on student feedback, whilst enabling the students to concentrate on coding the task not the environment. The software is free and multiplatform so it didn't matter whether the students were running it on a Mac, PC or Linux-based machine. This enables the students to download and run the software on their own machines.