SqueakCMI Notebook:
Projects, Tools, and Techniques

Introduction

Welcome to eToys/Squeak: an object-oriented programming language. This notebook was written to introduce Squeak to curious beginners with step-by-step descriptions of projects and how they were done.

Advice is freely given in the hope that the path you take to learning eToys/Squeak is quick and smooth. The Squeak community will be generous with their time, their knowledge, and their willingness to help newcomers. The Office for Mathematics, Science, and Technology Education at the University of Illinois Urbana-Champaign invites you to use these materials to the benefit of students everywhere.

These projects can be explored on the computer by opening them from www.Squeakcmi.org. This dynamic experience of projects on the computer in conjunction with the written materials should give you a range of ideas and possibilities to combine in many ways and for many purposes.

Section I

This section contains two easy projects designed to help you get started with Squeak. They are followed by an extensive description of the rich resources, tools, icons, supplies, and conventions that make Squeak what it is.

Section II

This section explains more complicated projects. They are in alphabetical order by the name of a Squeak tool used predominantly in that project. The projects are not in sequential order by level of difficulty. The project's name can be used to locate that project atwww.Squeakcmi.org. So, if you wonder, "What is a scale factor and how could it be used in a Squeak project?" you can find out.

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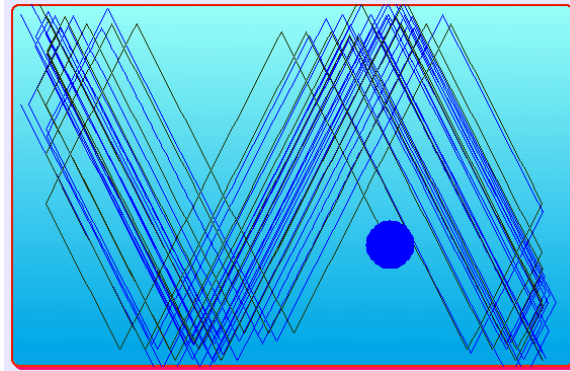
www.SqueakCMI.org

Resources, projects, tutorials, and standards-based lessons applying Squeak in math, science, language arts, social science, and art. Additional projects and essays can be found on the website. Tutorials developed by math specialists show the myriad ways Squeak enriches the study of geometry and trigonometry. The SqueakCMI community can answer questions, share ideas, and schedule workshops.

www.squeakland.org

The origin of Squeak: software, tutorials, and example projects. Get the most current versions of the software at Squeakland. The site includes interesting essays about the nature of learning, about programming and thinking.

www.squeak.org

Technical information for experienced programmers and developers
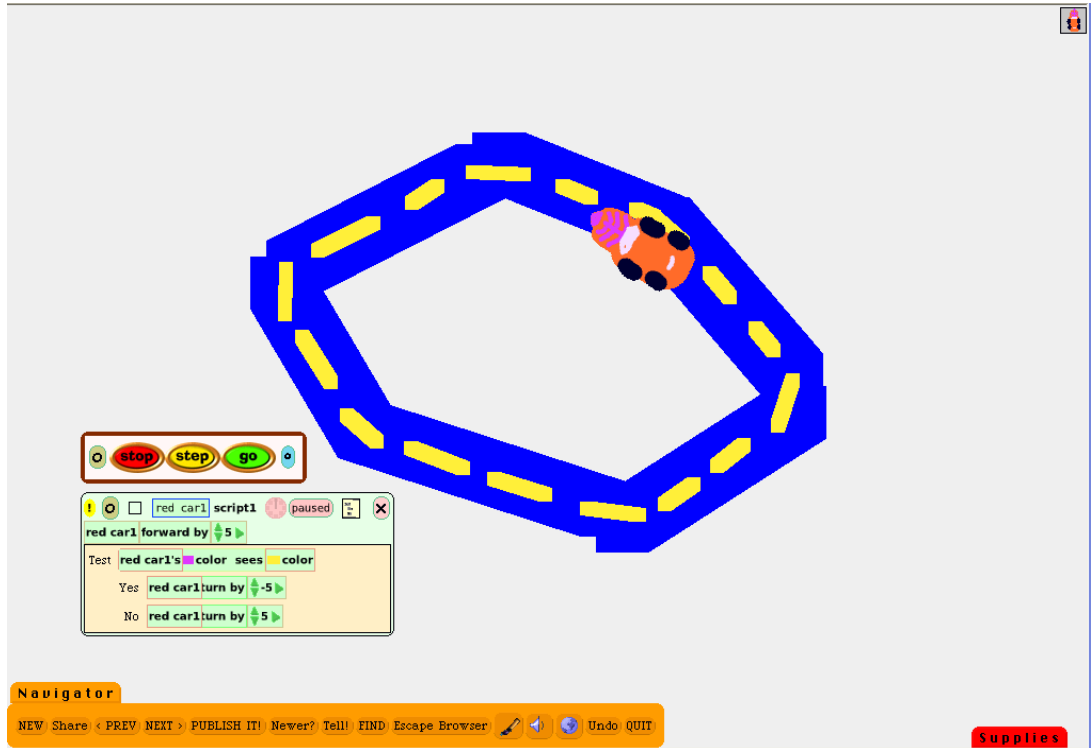
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Tests: testCarnb

This project uses a test statement to keep the moving car on the road.

Draw a car and keep it. Draw a road or maze path that you want to use in the project and keep it as a separate object. Do not draw the car and the road with the same paint brush. If you do that, the car and road will be treated as one object rather than two and it will be impossible to make the car move without the road moving too.

Use the cyan eye in the halo handle for the car and open a viewer panel of script tiles.

Name the object car build a script by dragging a copy of a car forward by 5 tile into an empty part of the screen and dropping it there to become a script.

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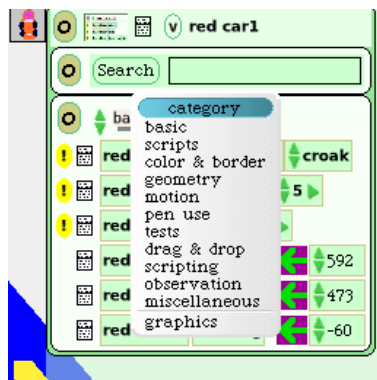University of Illinois Urbana-Champaign
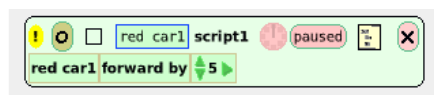
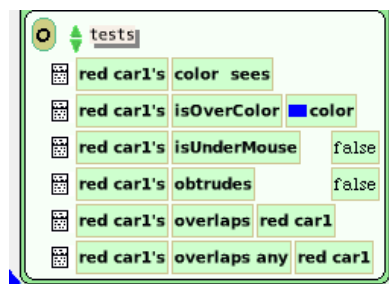Click on the small beige rectangle just to the left of the pink backed X to get a copy of a test form.

This beige rectangle is a supply of test forms. A project can contain many test forms. This project just uses the one which you will drop into the script box where you found it.
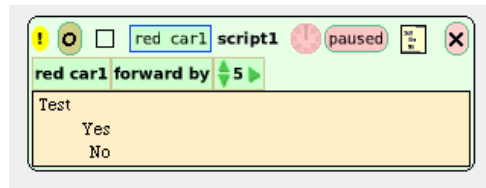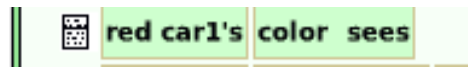

In the viewer panel of scripts, click and hold down on the category label basic and open a menu. Choose tests by clicking on it.

There are six types of test statements in this category of the viewer panel.

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This project uses the first test statement.

red car1's color sees

When you click on that tile, it changes when it attaches itself to the cursor and adds two red boxes and another word, color.

red car1's ■ color sees ■ color

The red boxes are there so that you can select exact color matches to the car you have drawn and to the color of the road you have for it to drive on.

When you touch the left red box with the cursor, a color chooser and palette of colors will open. Use the chooser and touch the front bumper of the car so that the test statement is an exact match.
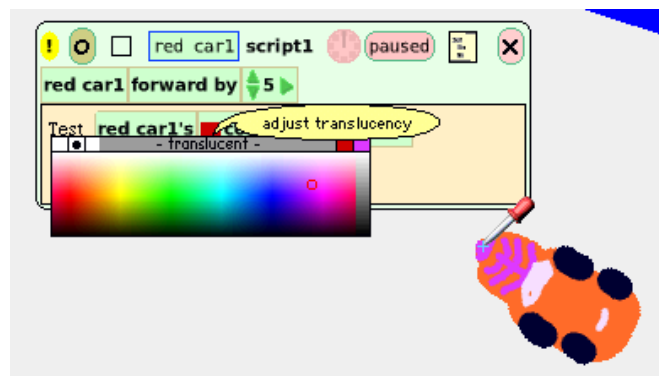
Now the color in the left red box is an exact match to the color of the car's bumper.

Test red car1's ■ color sees
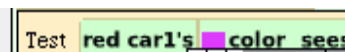
Now the color of the red box on the right must be changed to match that color of the road in your project.

Click in the remaining red box and use the paint chooser again but this time touch the yellow line in the middle of the road.

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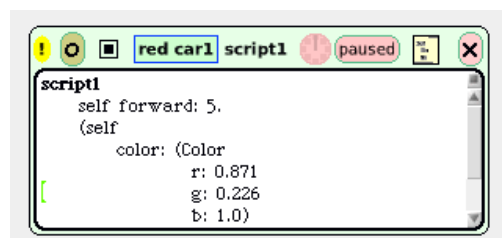University of Illinois Urbana-Champaign

Do not try to match the colors by guessing and trusting your eye and computer screen to get an exact match. The colors are combinations of color blends and they are specified by decimal numbers to three places. To see this, click on the empty square box in the top line of the script third from the left.
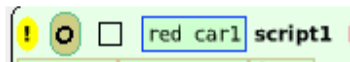
This will open a different version of the script and show it to you without the tiles. Here you can see what numerical values of r (red), g (green) and b (blue) gave the result chosen for the red car's bumper.

It is very important that it be an exact match by the numbers in a test statement otherwise the computer will not recognize the color and act in the way you expect.

Here is the color used in this project.

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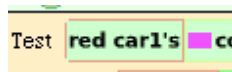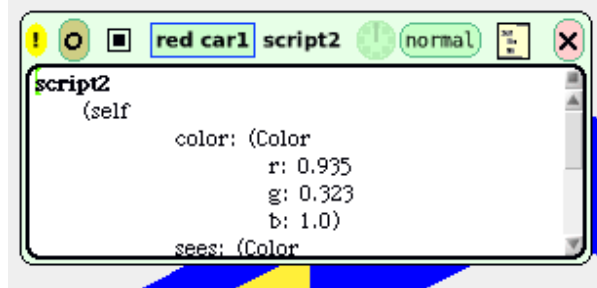University of Illinois Urbana-Champaign

The pink bumper is: r: 0.871
g: 0.226
b: 1.0

If you managed to select a color by eye that was different by even one digit then the test statement would not operate in the script. Your eye might not perceive the difference but the computer would.
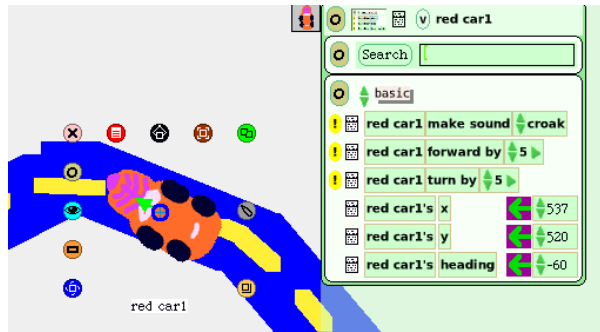
Here is a pink chosen by guessing

The decimal values of it are very different.

Now the script can be finished to make the car guide itself along the road as it moves forward.

The car in this project goes forward and if the front bumper sees yellow then the car will turn in a negative direction. If it does not see yellow if will turn in a positive direction. If the road has turns that are too sharp an angle or the forward number is too big then the car may not stay on the road as well as it will if those factors are considered.

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Here is the finished script for this project.

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