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Computer Graphics Using AgentSheets

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Computer Programming –
Elective 11-12 Computer graphics

My project uses Agent Sheets. There are three worksheets to display three separate situations that arise when filling graphics.

When filling a object on the graphics screen it must have a closed, one color border. The command needs an x,y coordinate of a pixel within the bounded area, and the color of the border. The algorithm fills the area by starting at the point and changing pixels until the border is reached.

If the border has a break in it, the fill “bleeds” out to the rest of the screen. If the border is not one color, the fill “bleeds” out through the non designated color.

The worksheets I will create will demonstrate that movement of color.

I will also create the same shape and size object that I use in the worksheet in paint. This will be used to demonstrate how small the pixels are that we work with, and that a break in the border is somehow very hard to see if just one pixel is missing.

The will be used as a demonstration. It will be revisited routinely at the beginning of the year.

The logic for the agent sheet will be:

If I see in my place an emptyspace and I am next to a greenspace then change myself to green.

If I see in my place a bluespace then change myself to green.

There will be no formal assessment for this activity.

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Level 2 lesson plan

Agents Sheet

Objective: To demonstrate the process of filling an item drawn with color.

Prelearning: floodfill (x, y, b);

In Turbo C++ the command to fill a closed drawing is floodfill with an x,y coordinate that is within the area and the border color of the item. Routinely black (color 0) is used as the border color setting up drawings to look like pages in a coloring book.

Example: floodfill(45,90,0); // This means starting at pixel 45,90 color until a black pixel is encountered

Materials: Agent sheets worksheets
Paint model

Using paint show a drawing the same shape number of pixels as the demonstration worksheets. Make sure one pixel is missing on the border.

Students routinely try to fill items that are not closed in one solid color. Using Agents Sheets first demonstrate the proper use of floodfill. Each space on the worksheet will represent one pixel on the graphics screen. Setting the speed to slow, students will watch the bordered area fill. Running at full speed, the area fills quickly as it would on the graphics screen.

Next demonstrate the worksheet that shows the border with one part missing. The color will bleed out through that space and fill the screen. Show the paint demonstration and make students aware that without close examination missed pixels are often overlooked.

Finally, demonstrate the worksheet that shows an area completely surrounded, however part of the border is not black. Once again the worksheet will bleed through the border and fill the screen.

This visual will show the students the method of filling and give them a visual reference should they come across a “bleeding” situation on their screen.

This demonstration will be used frequently at the beginning of the course to remind students of the problems that may arise when trying to floodfill.

Questions:

How does the program fill spaces on the screen?

How will this model fill? (show worksheet – fillclosedarea)

How will this model fill? (show worksheet – fillopenarea)

How will this model fill? (show worksheet – filltwocolors)