Assignment 1204
OK, back to the code gang. This time themed around the direct manipulation interaction style, of course.

Outcomes
This assignment will affect your proficiency measures for outcomes 2b, 3a, 3b, and 4a–4f.

Background Reading
Textbook reading is centered on the direct manipulation interaction style, which would be Shneiderman/Plaisant Chapter 5.

For the programming assignments, the most helpful additional material outside of the web and the bazaar code will be the case studies in Chapter 9 of the JavaScript textbook. These case studies demonstrate lower-level event handling with some direct manipulation elements.

For Submission
Direct Manipulation Exercise
This exercise gives you some firsthand experience in implementing direct manipulation. To do this, you will need ready access to a device with a multi-touch web browser. If you have your own device, then great; if not, we can arrange for you to check one out from the Keck lab.

Modify the boxes-touch bazaar code so that it supports creation and deletion, allowing for more than one action at a time (one per finger). You should, of course, preserve the box-moving functionality that is already present in the web page. For deletion, provide visual feedback that a box will be deleted when the user’s finger is lifted.

How to Turn it In
Commit a copy of your modified code under direct-manipulation in your private 370 GitHub repository (i.e., don’t make the changes in place and issue a pull request), and upload your work to my.cs.lmu.edu so that it is available under the path ~username/cmsi370/direct-manipulation.

For Submission
A User Interface Widget from Scratch
We end by going back to the basics: design and implement a reusable widget for use in web browsers in general, and for your role-playing game user interface in particular. To emphasize reusability, you will implement your widget as a jQuery plug-in.

The point here is to see how low-level event handling (e.g., mouse/keyboard activity) translate into higher-level ones (e.g., selection or change events). If the first programming assignment involved direct manipulation “in the large,” this one exercises direct manipulation “in the small.” Some ideas:

• A selection knob or slider
• A rolling or scrolling item selector
• An entry field that accepts text/numbers with drag-and-drop character tiles
• A “here-to-there” drag-and-drop area
• A directional pad (“d-pad”) control

You may use jQuery but Bootstrap use may be CSS only—no Bootstrap JavaScript components allowed, whether in code or triggered by data attributes. If you have a widget idea that is not in this list, check with me to see if it will work.

How to Turn it In
Commit your code in two places. Under widget-from-scratch/, provide these distinct pieces:
1. The reusable code for the widget itself (typically CSS and JavaScript)
2. A “demonstration page” that shows a stand-alone instance of your widget in action
3. “Eat your own dog food!” Under rpg/, integrate your widget into the user interface that you have already built.

Finally, as before, upload your work to ~username/cmsi370/widget-from-scratch and ~username/cmsi370/rpg, respectively, on my.cs.lmu.edu.