**Spike:**  *9*

**Title:** Composite Pattern

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**Goals / deliverables:**

The goal is expanding on the entities and their properties in the Zorkish Adventure game. Now you should also add a way to modify and observe these entities and expand the command processor to accommodate the changes.

To create this spike, you require:

* Spike 8
* Basic understanding of Composite Patterns

**Technologies, Tools, and Resources used:**

List of information needed by someone trying to reproduce this work

* Visual Studio 2015
* Composite Pattern
  + <https://en.wikipedia.org/wiki/Composite_pattern>

**Tasks undertaken:**

* Create an entity you can modify. Bag:
  + Can open and close
  + Add/ Remove items
  + Print all items
* Add new command objects to accommodate the change
* Update the Command Manager.

**What we found out:**

* When you are creating the bag. You can add a Boolean value to check if the bag is open or closed. This saves a lot of time creating if statements to check.

**Open issues/ risks:**

* Pointers cause too much trouble. If a variable doesn’t need to be a pointer, then don’t make it a pointer. If you are not sure if you need a point for it? Don’t make it a pointer until you are required to make it a pointer.