COS 214 Project Initial design

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**Functional Requirements:**

**Design Patterns and their responsibility:**

* Abstract Factory:
  + AbstractProductA = Rockets (concrete products: Falcon 9 and Falcon Heavy)
  + AbstractProductB = Dragon Spacecraft ( concrete products: Crew Dragon and Dragon Spacecraft)
  + AbstractProductC = Satellites ( concrete products: Starlink Satellite)
* Command and Mediator: Will do tests on all the Rockets vitals, and if all is ready for launch (will be detected by observers from the mediator pattern), the appropriate class will execute the “static fire” test.
* State : The state will indicate whether the rocket is prepared for launch or not (as will be set by the test mentioned in the point above).
* Memento: Used to refurbish and restore the previous state of the drone ship.
* Composite:
  + Falcon 9 and Falcon heavy will be Composite participants
  + …need help with what to add
* Decorator or builder: Use this to add different spacecrafts to the rocket (either a. Falcon 9 or a Falcon heavy). E.g. adding a Crew Dragon to a Falcon 9 rocket.
* Chain of responsibility: Each child of the stages will have their own responsibilities, and thus their own overloaded functions e.g.
  + Falcon 9 stage 1: 9 core with 9 Merlin engines responsible for getting the stage 2 and the payload into orbit.
  + Falcon 9 state 2: Single Vacuum Merlin Engine responsible to get the payload into the desired orbit.
* Strategy: Define algorithms for loading passengers or cargo. Depending on the rocket model, they will load their respective goooooods.
* Observer: To detect and update communication channels. Assuming the communications indicate when the rocket/stages arrive at their desired orbits.

**Questions:**

* Which falcon rockets are used where? E.g. Dragon Spacecraft doesn’t mention a particular Falcon rocket that is used.
* For interrupted test simulations, will it be something like: Ask the user if they want to increase the thrust power? Then continue with test will the updated values.
* In the main, will we ask:
  + How many simulations do you want to run?
  + Pick your components
  + Add that snapshot to an array
  + Repeat
  + Loop through array and run all stored simulations