User experience Example : Plot HR diagram for observational and theoretical cluster data.

(meeting notes from April 2005)

Use Case: User wants to compare observational and theoretical HR diagrams for given cluster parameters (ex 'cluster age' or named cluster like "47 Tuc").

1. Setup: the user indicates to the GUI which quantities which they are interested in. In this case, the user selects "**ClusterGalaxy(star(B-V, M_V))**" where "B-V" and M_V" are the B-V color and M_V is the apparent visual magnitude of stars within the cluster. Furthermore, the user is only interested in stellar data from 47 Tuc, so he sets **CluserGalaxy.name** = "47 Tuc".

2. The computer (via the "class hunter") does an initial search of the local ontology to see which (descendant) classes are relevant to this search. In other words, it finds all galaxy cluster sub-classes which have all requested properties present (e.g. "GalaxyCluster.**name**", "star.**B-V**" and "star.**M_V**").

3. The class hunter/inference engine (in this case) finds that the following exist:

   ClusterGalaxy(name, star.B-V, star.M_V)
   ClusterGalaxy(name, star.B, star.V, star.M_V) (related via simple algorithm, see Hubble constant example for what should happen)

4. The user accepts these matches and submits his request (to the data hunter) and after summary meta-data are retrieved reviews the datasets which qualify. He is presented with only observational data because no the theory data have the name="47 Tuc" which match. *Importantly, the observational data do not all reside within a single dataset.* Rather, the data hunter is trying to aggregate similar information from two or more catalogs to create the **ClusterGalaxy.**star objects which will be returned. The user reviews this aggregation, seeing that the data hunter used the RA, DE of stars in separate catalogs for 47 Tuc which each have B and V magnitudes.

5. The user retrieves and saves (to the side) his observational data.

6. To find theoretical data, the user reuses the search in 1, but backs out of the name=”47 Tuc” restriction. Instead, he specifies a range of cluster ages to retrieve. This could be a *set of values*, but here, *the user specifies 1 to 1000 Myr range*. Furthermore, he may specify the restriction that the data be “calculated” (Data model allows for selection on the provenance) rather than “observed”

7. As in steps 2-4, the class hunter looks for matching classes/route in the ontology, presents them to the user for “approval” and passes them off to the data hunter, which after an initial search presents possible data to be retrieved. After this second approval the data hunter downloads the theoretical dataset(s) to local disk.

8. Using the “data analyzer”, the user feeds both the saved observational and theoretical datasets, specifying that the analysis is to model both separately with the same simple model, and then compare model parameters to locate the closest match between the HR diagram of the observational and theoretical data. (***yes, this section not well-described...please edit in more -b.t.)***