1.1
This step basically involved creating subclasses of the overall Thing object, updating the URI's with the ones provided in the spec. The main thing here was making sure each sibling was disjoint with the others at every level. Then, defining the object properties was also straightforward, as I did not add any inverses (as they were not expected of us to implement in the spec). Datatypes were added and given domains of vehicles and ranges as specified.
1.2
All I did here was leverage the class expression editor to specify the two cases for object properties. The some keyword defined the must have, and the restriction was imposed for particular cases with the only clause in the class expression editor.
1.3
Created instances of each specified class with params given using the individuals by class tab and functionality for data prop assertions.
1.4
Defined the class as a defined class, then set the subclass param as done in the submitted owl ontology file (>=40000). Then I ran the reasoner and it was able to associate all individual instances with the money >= 40000 as expensivecars.

For part 2, all my dataproc and relevant scripts are in the appropriate folders. Only thing to note is that my computer could not handle the 9M+ entries in the entire target space, so to generate the F-score values I subset the pairs for the first ~100,000 of the target space. The screenshot of the full run is here:

```
(558) ➜  cli ./run.sh
2903 [main] INFO  org.linqs.psl.runtime.Runtime  - PSL Runtime Version 2.3.2-1b12269
26948 [main] INFO  org.linqs.psl.util.RandUtils  - Using random seed: 33298695
27303 [main] INFO  org.linqs.psl.application.inference.InferenceApplication  - Grounding out model.
37452 [main] INFO  org.linqs.psl.application.inference.InferenceApplication  - Grounding complete.
41080 [main] WARN  org.linqs.psl.application.learning.weight.TrainingMap  - Found 396 missing targets
(truth atoms without a matching target). Example: SAMEMOVIE('a-486', 'b-462').
41082 [main] INFO  org.linqs.psl.application.inference.InferenceApplication  - Beginning inference.
43271 [main] INFO  org.linqs.psl.reasoner.admm.ADMMReasoner  - Optimization completed in 21 iterations
. Objective: 174.6589232148702, Feasible: true, Primal res.: 0.021318791429836878, Dual res.: 0.001705
7124842242187
43430 [main] INFO  org.linqs.psl.application.inference.InferenceApplication  - Inference complete.
43430 [main] INFO  org.linqs.psl.application.inference.InferenceApplication  - Writing results to Data
base.
59008 [main] INFO  org.linqs.psl.application.inference.InferenceApplication  - Results committed to da
tabase.
59023 [main] INFO  org.linqs.psl.runtime.Runtime  - Writing inferred predicates to directory: inferred
-predicates
64206 [main] WARN  org.linqs.psl.application.learning.weight.TrainingMap  - Found 396 missing targets
(truth atoms without a matching target). Example: SAMEMOVIE('a-486', 'b-462').
64283 [main] INFO  org.linqs.psl.runtime.Runtime  - Evaluation results for SAMEMOVIE -- Accuracy: 1.00
0000, F1: 1.000000, Positive Class Precision: 1.000000, Positive Class Recall: 1.000000, Negative Clas
s Precision: 1.000000, Negative Class Recall: 1.000000
(558) ➜  cli
```

However, the dataproc submitted contains no subset (commented out on line 84). If the PSL model is taking too long, the data may be subset with that.