Exercises sheet – OWL/DL Modelling

1. Use Protégé[1] editor to define the following classes and properties in an ontology:
   - Define classes *Person*, *Man*, *Woman*, *Human* and *Child*
   - Define object properties: *hasChild*, *hasDaughter* and *married*
   - Define data properties: *hasAge*, *birthday* and *name*
   - Define appropriate domains and ranges for the properties above
   - Insert individuals: *anna*, *lena*, *peter*
   - Express the following facts:
     a. all individuals listed above are persons;
     b. *anna* and *peter* are married;
     c. *lena* is their daughter;
     d. define names of individuals, e.g. *anna* has name "Anna";
     e. guess some meaningful ages and birthdates for the persons

2. Extend the ontology with the following axioms (define new classes if needed):
   - Each person is a human
   - Each parent is a person that has some child
   - Only a human can be a parent of a human child
   - A daughter of a person is also a child of that person
   - A happy mother has happy daughters.

3. Define an inverse property for the property *hasChild*

4. Define a *grandChild* property

5. Model the following ontology in Protégé and identify why class B is unsatisfiable, i.e. B SubClassOf owl:Nothing ?
   - *A* **SubClassOf** *B*
   - *F* **EquivalentTo not** *B*
   - *B* **SubClassOf** *C* **or** *D*
   - *C* **SubClassOf** *F* **and** *G*
   - *D* **SubClassOf** *G*
   - *D* **DisjointWith** *B*

[1] Protégé can be downloaded from http://protege.stanford.edu/products.php#desktop-protege