Exercise 5

(a) Write an OWL ontology that formalizes the domain described at point (a) of Exercise 4.

(b) Add to the above ontology the axioms formalizing the following statements:

1. every manager leads at most one division;
2. City and Division are disjoint classes;
3. a SpecialDivision is a division for which at least four managers work;
4. a SpecialManager is a manager that manages at least two male employees and at least two female employees;
5. every employee lives in exactly one city;
6. every male employee works with at least one male employee and works with at least one female employee.

Then, tell whether the resulting OWL ontology is redundant, i.e.: can some of the axioms constituting the ontology be deleted without changing the meaning of the ontology? if so, identify and list such axioms.

b)

1) subClassOf(myns:Manger ObjectMaxCardinality(1 myns:leadsDivision myns:Division))
2) DisjointClasses(myns:City myns:Division)
3) EquivalentClasses(myns:SpecialDivision ObjectIntersectOf(myns:Division ObjectMinCardinality(4 ObjectInverseOf(myns:worksInDivision) myns:Manger)))
4) EquivalentClasses(myns:SpecialManager ObjectIntersectOf(myns:Manager ObjectMinCardinality(2 myns:isManagerOf myns:Man) ObjectMinCardinality(2 myns:isManagerOf myns:Woman)))
5) subClassOf(myns:Employee ObjectExactCatdinality(1 myns:livesIn myns:City)
6) subClassOf(myns:Man ObjectIntersectOf(ObjectMinCardinality(1 myns:worksWith myns:Man) ObjectMinCardinality(1 myns:worksWith myns:Woman)))