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Assignments 12.1 - 12.3
Lectures 9.1-10.1, Textbook Chapter 14
Conceptual analysis and synthesis

Assigned: Sept. 16+
Due: Sept. 23+

12.1 and 12.2 assigned after Lecture 9.1 and due at Lecture 10.1, ^Sept. 23
12.3a and 12.3b assigned after Lecture 10.1 and due on Sept 23.

Learning objectives	<p>Solidify understanding of classificatory structure through practicing the process of conceptual analysis and synthesis as discussed in Chapter 14 and illustrated through the in-class exercises. (More elaborate: P2.3.9,3#; P2.3.9,3.3#)</p> <p>Specifically:</p> <ol style="list-style-type: none"> 1. Understand semantic factoring through practicing it (the only way). (More elaborate: P2.3.9,3.2#) 2. Understand how to build a hierarchy through applying the pragmatic definition of <i>A is broader than B</i> in a limited set of <u>elemental</u> concepts. Understand the nature of hierarchical relationships among concepts. (P2.3.9,3.1#) 3. Understand the interaction between concept combination and hierarchy. (More elaborate: P2.3.9,3.5#)
Materials, Tasks, Deliv.	See individual assignments in this group

<p>Each part of the assignment is concerned with one step in the process: (You may want to read the more detailed explanation on the back first.)</p>	
Assignment 12.1	Semantic factoring (results in a list of elemental concepts).
Assignment 12.2	Arranging the elemental concepts in a well-structured faceted hierarchy.
Assignment 12.3	<p>Fit compound concepts into the framework of the hierarchy (if compound concepts need to be dealt with explicitly)</p> <p>Assignment 12.3a is an exercise in facet combination unconnected to the set of concepts from Assignment 12.1. The point is to practice building a hierarchy from facet combination.</p> <p>The graded Assignment 12.3a will be returned before you start 12.3b</p> <p>Assignment 12.3b returns to the set of concepts from Assignment 12.1, working from the answer key for Assignment 12.2 and list of original concepts from 12.1, applying the principles learned from Assignment 12.3a.</p>

Note: The concepts given for Assignment 12.1 deliberately come from two domains, *Medicine* and *Transportation*. There might be elemental concepts that apply to both!

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There are three steps in the **conceptual analysis and synthesis** in a subject (Lecture 9.1)

Step 1.	Semantic factoring (results in a list of elemental concepts).
Step 2.	Arranging the elemental concepts in a well-structured faceted hierarchy.
Step 3.	Fit compound concepts into the framework of the hierarchy (if compound concepts need to be dealt with explicitly)

We practiced these steps in the interactive sessions; in each sub-assignment you practice what you have learned in an interactive session.

The assignments build on each other. **Submit each assignment for immediate feedback** that will help with the next assignments. For example, 12.1 needs to be done right so you have the right set of elemental concepts for Assignment 12.2.

The overall sequence is as follows:

Lecture 9.1. Semantic factoring and facet organization

Assignment 12.1 Step 1. Semantic factoring (results in a list of elemental concepts).
You learned how to do this in, Lecture 9.1, first half

Assignment 12.2 Step 2. Arranging the **elemental concepts** in a well-structured faceted hierarchy. You learned how to do this in Lecture 9.1, second half

Submit your results quickly so they can be returned with corrections before you use them for the next step

Lecture 10.1. Building a hierarchy of compound concepts from facets.

Assignment 12.3 Step 3. Fit compound concepts into the framework of the hierarchy (if compound concepts need to be dealt with explicitly)

This is divided into two pieces.

Assignment 12.3a is an exercise in facet combination to practice what you learned in Lecture 10.1 with a different example. In this example the facets are given. The subject domain is language/verbal ability, quite **unconnected** to the set of concepts from Assignment 12.1. Again, the point is to practice building a hierarchy from facet combination.

Now you are ready to apply what you learned in Assignment 12.3a about building a hierarchy from facets to the set of concepts from Assignment 12.1. This is done in Assignment 12.3b.

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Assignment 12.1
Semantic factoring

*Assigned: Sept. 16**Due: Sept. 23***Do before Lecture 10.1.**

Learning objectives	Understand semantic factoring through practicing it (the only way). (More elaborate: P2.3.9,3.2#)
Materials	A list of terms that designate compound concepts, with definitions , p. ~143.
Tasks	<p>For each term in the list, determine the semantic factors, or components of meaning, of the concept it designates, that is, express each concept by a combination of elemental concepts (or what you consider elemental concepts). Consult the definitions given. If you cannot find semantic factors, or if there are different sets of semantic factors because of term ambiguity, write a comment.</p> <p>Since you have no list of elemental concepts to choose from, you must make up your own elemental concepts and choose the terms to express them. (This happens often in the construction of index languages.) But be consistent: if the same elemental concept occurs more than once, use the same term each time.</p> <p>Note: Use the most specific elemental concept for each aspect of the concept to be expressed. For example, if the disease is a type of cancer, use the specific elemental concept <i>cancer</i> as the semantic factor, not the more general elemental concept <i>disease</i>.</p> <p>When you are finished with semantic factoring, prepare a list of the elemental concepts you used. For example, your list should have one entry for <i>cancer</i>, which occurs several times as a semantic factor. This list will be the basis for Assignment 12.2.</p>
Deliverables	<ol style="list-style-type: none"> 1 A list of the compound concepts with their semantic factors. 2 A list of the elemental concepts used, each concept on its own line. (This will be the basis for Assignment 12.2.)
Time	1.5 hours

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Definitions you may need

The terms in this assignment (and the concepts designated by these terms) come from the domains of medicine and transportation. You may not be familiar with these terms, but that will happen to you often in practice. You are information specialists, so if you do not know something you should know where to find out. In this case you need definitional knowledge, so you consult a dictionary. To save you time, I compiled the definitions you need here.

Leukemia	Cancer of white blood cells (also called leukocytes)
Mononucleosis	An infectious disease of white blood cells caused by a virus
Pneumonia	An inflammation of the lungs
Conjunctiva	The mucous membrane covering the anterior surface of the eyeball and lining the eyelids Note: Consider body parts to be elemental concepts
Conjunctivitis	An inflammation of the conjunctiva. Some forms of conjunctivitis are infectious, others are not.
Wind tunnel	A tubular chamber or structure in which a steady current of air can be maintained at controlled velocity, equipped with devices for measuring [the aerodynamic] forces and moments on scale models of complete aircraft [or cars] or of their parts or of full-scale aircraft [or cars] or their parts. (Random House Dictionary)

Assignment 12.1. Concept list for semantic factoring

Compound concept	Semantic factors – elemental concepts
0. Example viral hepatitis	inflammation : infection : virus : liver
1. leukemia	
2. leukemia - diagnosis	
3. leukemia - drug therapy	
4. leukemia - radiation therapy	
5. pneumonia	
6. pneumonia treatment	
7. lung cancer	
8. mononucleosis	
9. conjunctival cancer	
10. conjunctival cancer - radiation treatment	
11. conjunctivitis	
12. conjunctivitis - drug therapy	
13. highway repair	
14. diagnosis of car problems	
15. car repair	
16. wind tunnel	

List of elemental concepts (use assignment template)

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Assignment 12.2**Assigned:****Sept. 16****Due:****Sept. 23****Building a faceted classification of elemental concepts***Do before Lecture 10.1.*

Learning objectives	Understand how to build a hierarchy through applying the pragmatic definition of <i>A is broader than B</i> in a limited set of <u>elemental</u> concepts. Understand the nature of hierarchical relationships among concepts. (P2.3.9,3.1#)
Materials	The list of elemental concepts produced in Assignment 12.1 Check the version from the answer sheet before you start
Tasks	Build a faceted classification of elemental concepts shown as a linear arrangement with indentation (with cross-references as needed). For elaboration see next page.
Deliverables	A faceted classification of <u>elemental</u> concepts shown as a linear arrangement with indentation (with cross-references as needed)
Time	1.5 hours

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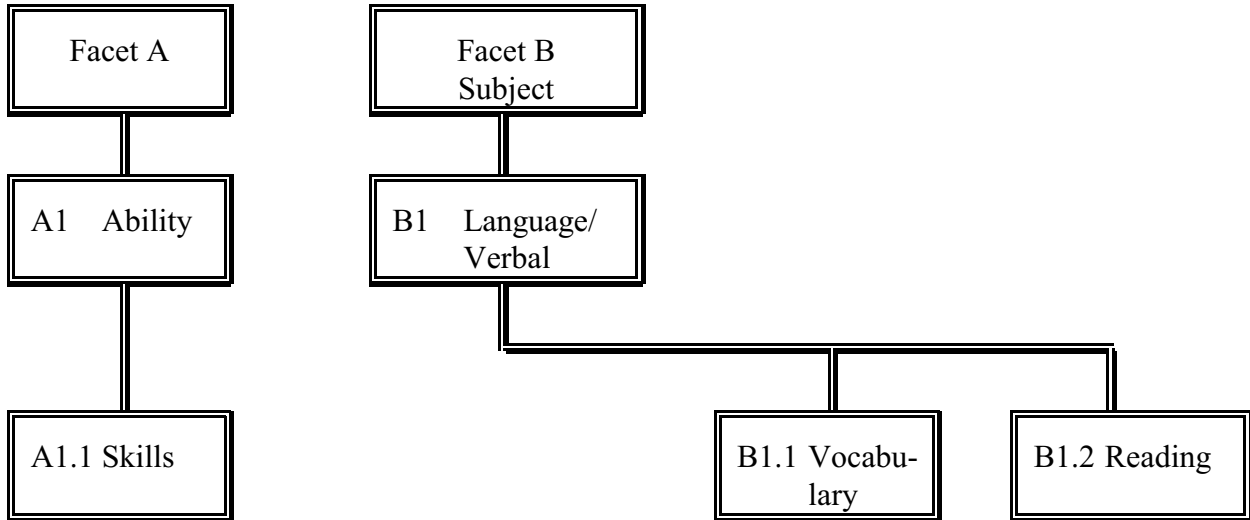
Elaboration of task: Build a faceted classification of elemental concepts	
Include only elemental concepts	<p>In Assignment 12.1 you started from a list of compound concepts and derived elemental concepts through semantic factoring. You prepared a list of elemental concepts.</p> <p>Here you start from this list (do not include any other concepts) and establish the hierarchical relationships among them. For example, in the hierarchy</p> <p style="padding-left: 40px;">do include <i>cancer</i> (elemental concept)</p> <p style="padding-left: 40px;">do not include <i>leukemia (cancer of leukocytes)</i> (compound concept)</p> <p>You will have a chance to fit compound concepts into a hierarchy in Assignment 12.3b, where you will build a hierarchy that includes all the concepts used in Assignment 12.1 in a well-structured arrangement..</p> <p>Avoid a frequent mistake: In a hierarchy listing such as</p> <p style="padding-left: 40px;">disease</p> <p style="padding-left: 80px;">. cancer</p> <p style="padding-left: 80px;">. . diagnosis</p> <p>“Diagnosis” does not refer to the elemental concept <i>Diagnosis</i> but to the combination</p> <p style="padding-left: 40px;"><i>cancer > diagnosis</i></p> <p>The elemental concept <i>diagnosis</i> belongs to different facet.</p>
All hierarchical relationships	<p>Be sure to introduce all hierarchical relationships that are useful for searching and/or the checklist technique of indexing.</p> <p>Before you stipulate that concept A has a Narrower Term B, ask: Does a user searching for A want to find all entities dealing with or relevant for B?</p>
May need additional broad concepts	<p>You may need to introduce additional <u>broad</u> concepts to make for a more logical, more easily understood hierarchy. In many places additional <u>specific</u> concepts will suggest themselves from the logic of your hierarchy; you need not add those, but you may add a few examples.</p>
Overall arrangement	<p>Your hierarchy may include one part for <i>medicine</i>, one part for <i>transportation</i>, and one part for concepts needed in both domains (if any) or not fitting in any of the two domains.</p>
Represent the hierarchy in outline format	<p>The hierarchical relationship A has Narrower Term B should be shown by arrangement and indentation (outline format) where possible and through a cross-reference otherwise. A hierarchy shown in a linear arrangement is often easiest to construct and always easiest to read. Since the hierarchy contains only elemental concepts there will be few if any cross-references needed.</p>

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Assignment 12.3a*Assigned:**Sep. 23**Due:**Sept. 30***Hierarchy from facet-combination. General practice**

Learning objectives	Understand the interaction between concept combination and hierarchy. (More elaborate: P2.3.9,3.5#)
Materials	The faceted classification of elemental concepts (two facets, hierarchy within facets shown p. ~148)
Tasks	<p>Construct the hierarchy of elemental and compound concepts generated by the two facets given. Use only between-facet combinations, that is, only combinations of an A-concept with a B-concept. Do not combine the facet headings (Facet A, Facet B) with anything. Represent this hierarchy in a 2-D graph. (You can draw on the assignment sheet.)</p> <p>Then represent the hierarchy in outline form (a linear arrangement with indentation) with cross-references. Repeat this choosing a different possibility for the linear arrangement.</p> <p>Note 1: When you do a linear arrangement with cross-references, many hierarchical relationships are shown by the arrangement. These relationships do not need to be shown again through cross-references. Only relationships not shown through the arrangement require cross-references.</p> <p>Note 2. This assignment uses classification concepts and procedures already discussed but you may still find it difficult; this is the first case with hierarchy in both generating facets. This assignment shows you (and the instructor) to see just what you do or do not know and forces you to thoroughly think about the problem. The assignment prepares you for Lecture 10.1.</p> <p>Note 3: To illustrate constructing a hierarchy from facet combination, this assignment uses a simple example unconnected to the set of concepts from Assignment 12.1. You deal only with the concepts given on the following page and their combinations; do not introduce any other concepts.</p>
Deliverables	<ol style="list-style-type: none"> 1 Hierarchy in 2-D graphical arrangement. (Can be on the assignment sheet and scanned. Do not waste time with computer graphics.) 2 Hierarchy in linear arrangement with indentation, with cross-references. Facet A first, facet B subordinate. 3 Hierarchy in another linear arrangement with indentation, with X-ref. Facet B first, facet A subordinate.
Time	3 hours

Assignment 12.3a



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Assignment 12.3b

Assigned: Apr. 15

Due: Apr. 22

**Hierarchy from facet-combination.
Application to the set of concepts from Assignment 12.1**

Do after Lecture 10.1.

Learning objectives	Understand the interaction between concept combination and hierarchy. (More elaborate: P2.3.9,3.5#)
Materials	<ol style="list-style-type: none"> 1 The original list of compound concepts given in Assignment 12.1 2 The hierarchy of elemental concepts created in Assignment 12.2 <p>The hierarchy of elemental concepts should look like the answer key from Assignment 12.2.</p>
Tasks	<p>Construct hierarchy from facets for the Assignment 12 subject domain Elaboration see next page.</p> <p>Assignment 12.3b returns to the set of concepts from Assignment 12.1, applying the principles learned from Assignment 12.3a</p>
Deliverables	A hierarchy in outline form (linear arrangement with indention) and cross-references for the concepts presented in Assignments 12.1 and 12.2.
Time	2 hours

Elaboration of Task: Construct hierarchy from facets for the Assignment 12 subject domain	
	<p>You will now apply the principles you have learned from Assignment 12.3a to the set of concepts from the Assignment 12 domain. Arrange all the concepts from Assignments 12.1 and the answer key for 12.2 (both the compound concepts which are given and the elemental concepts that you derived) in a hierarchy. Represent the hierarchy in a linear arrangement with cross references; graphical representation is not required and would be too complex (there are too many concepts).</p> <p>Start from the hierarchy of elemental concepts you developed in Assignment 12.2 (as corrected after receiving the answer key) and fit the compound concepts given in Assignment 12.1 into the structure. A compound concept has more than one broader concept, one for each semantic factor; choose one place for the arrangement and make a cross-reference from the other. Do not create all possible combinations of elemental concepts (as you did in Assignment 12.3a); just use the compound concepts actually listed in Assignment 12.1, possibly adding a few new concepts to fill in hierarchical steps or otherwise make the hierarchy more logical .</p>
Hints	<p>Use a word processor. Copy the hierarchical arrangement of elemental concepts from the answer key for 12.2, then copy and paste each of the terms for the compound concepts you were given for Assignment 12.1 into one of its possible places in the hierarchical arrangement, using the semantic factors as your guide; make a cross-reference to and from the other possible place(s). Remember that you already dealt with the meaning of all these terms when you did semantic factoring in Assignment 12.1; now you just use the semantic factors as a guide for fitting the compound concepts into the hierarchical arrangement with cross-references.</p> <p>Write out each term so it can stand on its own outside the hierarchy:</p> <p>Not</p> <p style="padding-left: 40px;">leukemia . diagnosis</p> <p>but</p> <p style="padding-left: 40px;">leukemia . leukemia – diagnosis [LCSH form. Yahoo form: leukemia > diagnosis]</p>
Important note:	<p>Do not introduce cross-references for hierarchical relationships that can be seen from the arrangement. Cross-references are used to show additional hierarchical relationships.</p>