EXERCISES*

Track: **Terminology**
Tutorial: **Advanced FHIR Terminology Services, incl. SNOMED CT**
Speaker: Michael Lawley

The speaker will be in the hands-on area to answer your questions!

During the hands-on session of the Advanced FHIR Terminology Services tutorial we will explore working with the terminology Resource types, creating example instances and using them with their associated operations. As discussed during the tutorial, there will be a focus on SNOMED CT as the base Code System, and the advanced features available via implicitly defined resources and the use of ECL for describing ValueSets.

The following exercises are somewhat progressive; some steps build on the previous steps, so you should try them out in sequence:

0. Consider completing the Practical FHIR Terminology Services exercises
1. Define SNOMED CT ValueSets using ECL
2. Create/modify a data entry widget to use each of your ValueSets
3. Use the $closure operation to identify the most general set of codes used in a set of Conditions
4. Use the $batch operation to translate multiple codes in a single request

Have fun, and remember to ask for help if you get stuck !

1. Define SNOMED CT ValueSets using ECL
Use http://hl7.org/fhir/snomedct.html and http://ontoserver.csiro.au/shrimp/ecl_help.html as references for the following:
- Identify the implicit ValueSet URI that consists of all descendants of Diabetes mellitus
- Write a corresponding ECL expression and use it to define an explicit ValueSet. Evaluate (updating where required) your definition with respect to the VSAC Authoring Best Practices: https://www.nlm.nih.gov/vsac/support/authorguidelines/bestpractices.html
- Use Shrimp's ECL tool: http://ontoserver.csiro.au/shrimp/ecl.html to write ECL expressions to match:
    o all Disorders where the finding site is the kidney
    o all Disorders where the finding site is the kidney or any descendant of kidney
    o all Procedures involving an excision and the kidney
    o all Procedures with exactly three procedure-sites
- Define a ValueSet consisting of all diabetes-related diagnoses excluding those associated with gestational diabetes
- Ensure your ValueSet excludes the concepts listed in the (Australian) Clinical finding grouper exclusion reference set

2. Create/modify a data entry widget to use each of your ValueSets
- Use http://plnkr.co or similar to create a data entry widget that allows a user to search for and select a code from each of your ValueSets. Alternatively, you may want to modify one of http://plnkr.co/wOjWbt or http://plnkr.co/q5vkph or use them as a starting point.
- Adjust the parameters to $expand to ensure only a useful number of results are retrieved (count=) and to minimise the size of the resulting ValueSet (_elements=).
- Modify your widget to conditionally use a picklist paradigm (radio buttons or dropdown) for ValueSets that have a small expansion.

3. Use the $closure operation to identify the most general set of codes used in a set of Conditions
- Search for a collection of Resources such as Conditions with SNOMED CT codes
- Initialise a closure table and then add all half the SNOMED codes used by the matched Conditions, and build an edge table from the returned ConceptMap
- Add the other half of the codes and update the edge table
- Identify all the codes that occur as parents in the edge table but not as children

4. Use the $batch operation to translate multiple codes in a single request
- Use the ConceptMap with URI http://example.com/ConceptMap/snomed-to-categories to $translate the codes from exercise 3 to reporting category codes

Tools that may help with the above:
- FHIR Server: URL to be supplied on the day
- SNOMED Browser: http://ontoserver.csiro.au/shrimp
- ECL tool: http://ontoserver.csiro.au/shrimp/ecl.html
- ValueSet explorer tool: http://ontoserver.csiro.au/vstool