Lab 10 – Caralibro

CC7220-1 – October 21, 2024

We will build a proof-of-concept social network using the principles of Linked Data that will not be as shiny as Facebook, but will be *decentralised*, meaning that users keep control of their own data. The social network will be built with RDF using the Friend of a Friend vocabulary (`http://xmlns.com/foaf/spec/`). We will use RDF Explorer to interactively load and view the social network as a graph.[1]

First we will play with some given examples.

- At `http://users.dcc.uchile.cl/~ahogan/foaf.ttl` you can find an example FOAF profile for Aidan. We can use RDF Explorer in order to load these data and visualise them as a graph. Visit the RDF Playground system at `http://rdfplayground.dcc.uchile.cl`, hit the BROWSE tab of the pane on the left-hand side, and enter the following URL where it says "Insert an URL here", and click SEARCH:

  `http://users.dcc.uchile.cl/~ahogan/foaf.ttl`

- The graph will show a lonely central node. On the right-hand side, you will see a list of documents (currently we only have one). Click the checkbox for the one document shown. Now the graph for the full document is shown and the node is no longer lonely. (*Note: There are known issues with IRIs being truncated or non-ASCII characters appearing corrupted in the graph visualisation; if you encounter these issues, you can ignore them.*)

- Click the expand arrow to the left of the document in the list. Here you will see a list of properties mentioned in the RDF graph of the document. If you deselect a property, the graph will be drawn again without the triples with that property. If you deselect the document, all properties (and thus all the triples for that document) will disappear.

- Deselect the document. Select only the properties `dc:creator`, `foaf:name`, `foaf:knows`.

- Given a dereferenceable (Linked Data) node in the graph, we can double-click on it to retrieve data about it from the Web. (Not all nodes will be dereferenceable.) Double-click on one of the nodes for people that Aidan knows (an object of `foaf:knows`). You will see an option to Extend Network. Click the START button and then RETURN. On the left, a new document will appear. Repeat the same to dereference the another node of a person that Aidan knows. Select the three documents to show all of their triples. You can hover over an edge in the graph to see which document defines the corresponding triple. (Feel free to deselect properties you're not interested in.)

- Next expand the node for Aidan's spirit animal (you will need to enable the `social:hasSpiritAnimal` property in the first document). This will load RDF data for the animal (species) from DBpedia. Be advised that the next part *might* crash your browser. Select the entire document. While waiting for the graph to redraw, whisper words of gentle encouragement to your browser. The graph is large, which is great because we have a lot of data now from the Web about Aidan's spirit animal. Deselect this new document and this time add some properties that interest you one-by-one. Given that some documents are large, the system allows you to rather select properties one-by-one.[2]

[1] Thanks to an extension of RDF Playground developed by Raúl Cid!

[2] We could alternatively use Wikidata rather than DBpedia for this lab, but the RDF documents it provides are *way* bigger.

1. [40 MARKS] Time for you to join this social network. You will make a user profile in RDF about yourself (you can invent data if you prefer). If working in a group, each member can optionally define their own profile, but we will ask you to submit one profile (and images in part 2) for one member of the group. We will describe these profiles in RDF (Turtle) using the FOAF vocabulary: `http://xmlns.com/foaf/spec/`. The profile will be published on the Web, so for personal data, feel free to make stuff up if you prefer.

   - You can copy the example at `http://users.dcc.uchile.cl/~ahogan/foaf.ttl` into a text editor as a template. Note the different identifiers used for the document and for Aidan himself. Create your own FOAF profile (based on Aidan's), as follows:
     - First you will need to choose a location to publish your file online. You may publish it on your user account in `anakena`, or on the account of a member of your group, or you could try on Github[3], or any other host you can use. Replace the `base` IRI in the Turtle file with the location that you have chosen: this should be the URL of the Turtle file once published online (keep the `http://` prefix; **better not to use a `https://` prefix, unless you really cannot access the document under `http://`**). If you're not sure about where to publish the file on the Web, you can postpone this step for now, but be sure to define the `base` IRI before publishing the document and moving onto Q2.
     - Add meta-data for the document of your profile, including the date, title, etc.
     - Choose a fragment identifier for yourself. I used `#ah` based on my initials but you can/should change this (it appears three times). Note that <> and <#ah> are relative IRIs in Turtle appended to the base, so even if your initials are the same, don't worry: the complete IRI will still be unique.
     - Add your name(s), age, etc. (again, you can lie).
     - Add your image/avatar (`foaf:img`).
     - Add your homepage (if you have one; you can also use LinkedIn profile, Twitter page, etc.)
     - Say that you know Aidan, and that you know at least three other colleagues in your class using their new IRIs (can also be members of the same group). You can also add more if you like! Be sure to use the IRIs referring to them (the person, with a fragment identifier) and not their profile document. (To facilitate this step, you can share IRIs in the forum on u-cursos.)
     - Keep the first `foaf:interest` value (referring to the Semantic Web on DBpedia; not that you were going to remove it ...) and replace the others with your own interests from DBpedia (add at least two others besides the Semantic Web, but it can also be more). You can find DBpedia entities using the keyword search service available at `https://lookup.dbpedia.org/`. When adding these interests, you can use the prefix `dbr:...` or the full IRI starting with `<http://dbpedia.org/resource/...>` (it is the same IRI, just different Turtle syntax). Note that if the resource has special characters, like brackets or punctuation, you may need to use the full IRI.
     - We created a small vocabulary for the lab: `https://users.dcc.uchile.cl/~ahogan/social.ttl#`. We will use the prefix `social:` for this henceforth.
     - Choose your own preferred values for the two properties `social:hasSpiritAnimal`, `social:likesMovie` and `social:hasFavouritePlatonicSolid`. The value(s) can come from DBpedia as before. The spirit animal and platonic solid properties should take one value (the vocabulary defines the properties to be functional in OWL). Add at least two movies that you like.
     - Add values about yourself for your choice of any two other properties from the FOAF vocabulary: `http://xmlns.com/foaf/spec/`. (The properties may or may not include `foaf:myersBriggs`, as you prefer.) In case the value of your property is an entity, not a string, try to find a good IRI for that value (e.g., using DBpedia) or create one if necessary.
     - Validate the syntax and visualise your profile with RDF Explorer using the local TEXT feature. Fix errors as needed.
     - Publish your FOAF profile in the location indicated by the base IRI you added earlier.

[3] If using Github, the location of your profile will be that of the *raw* file, not the HTML page previewing the file.

2. [20 MARKS] Now its time to explore the graph of our social network. Load your profile into RDF Explorer using BROWSE and entering the URL where you published your profile. In the following, you can obtain an image of the current view of the graph by right-clicking on the graph, and choosing "save image as" or similar (otherwise you can grab a screenshot). You will be asked to upload a report with these images. (The images do not need to be perfect, but do your best with the resolution you have available.)

   (a) Select the full document for your profile. Zoom the graph and move the nodes around so all of the data fit in the window. Save a screenshot.

   (b) Extend the network by dereferencing one of the nodes of at least one of the people you know (who we will henceforth refer to as your friend). Select the full document to display all of the data in the graph. Centre and zoom the graph on the data from their document, and grab a screenshot. (You do not need to capture the entire graph, just the data from their document.)

   (c) Extend the network further by dereferencing one of the nodes for the movies that your friend likes. Do not select the full document, but rather only the properties for its director and the people starring in it. (In case you see duplicate properties under the `dbo:` and `dbr:` prefixes, choose only the `dbo:` property; otherwise choose whatever is available.[4] In case the properties are not available, try another movie.) Centre and zoom the graph on the data about the movie, and grab a screenshot.

   (d) Extend the network further by dereferencing the director node from the previous step. Select only the director property from the new document to see other movies that they have directed. Centre and zoom the graph on the data about the director, and grab a screenshot.

   (e) Refresh RDF Explorer and enter your FOAF profile again. For the available FOAF profiles, select only the property `foaf:knows`. Recursively expand the network with all of the non-DBpedia nodes that appear connected in the graph through these properties, selecting the same two properties in the new documents (where available) so they appear in the graph; keep going until you have successfully dereferenced at least ten documents, but if you like, you can keep going and dereference as many as you like. Some documents may not work due to an error in how the IRI is defined, or the document no longer being available; you can simply skip over these documents. Finally, in all of the FOAF profiles now collected, select the properties `foaf:name`, `foaf:interest`, `social:hasFavouritePlatonicSolid`, `social:hasSpiritAnimal` and `social:likesMovie`. Does anyone have something in common with you? Grab the best screenshot you can of the graph representing the largest connected component of the social network (the individual nodes don't have to be readable).

Note that the social network consists of RDF data. We could reason over it using RDFS/OWL, query over it using SPARQL, etc. The social network also connects to DBpedia, which connects to Wikidata, which connects to ... so it's more than just a social network: it's a small corner of the Web of Data.

SUBMIT: two files – `foaf.ttl` and `lab10.pdf` – with `foaf.ttl` containing the data you added for yourself in Q1 and `lab10.pdf` containing the images for each part of Q2 (indicating which images correspond to which part of Q2). If working in a group, please upload one profile and one PDF for one member.

[4] DBpedia defines two namespaces for properties. The `dbo:` properties are based on manual mappings of some common attributes in Wikipedia infobox templates, and tend to be cleaner. The `dbr:` properties are automatically extracted from unrecognised infobox attributes, and can *sometimes* be "dirtier". Hence `dbo:` is preferred, but often `dbr:` is fine.