

## The DataLex legislation preprocessor for rules as code

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AustLII's [DataLex project](#) has pioneered the development of 'rules as code', the conversion of legislation into running code which applies legislative provisions to individual situations, and generates conclusions as to whether it applies and why.

The code which DataLex runs (*yscript*) is English-like, with a strong resemblance to the legislation that it encodes. It can be understood by people who are not computing experts, and can be written by them, requiring only a modest amount of training and practice.

DataLex researchers have written a variety of applications demonstrating both how the code is understandable, and how well it runs. These include applications to [Australia's Foreign Relations Act](#) (see [code](#)), the [News Media and Digital Platforms Mandatory Bargaining Code](#) (see [code](#)), the NSW [Community Gaming Regulation](#) (see [code](#)) and eligibility issues in Commonwealth [Electoral law](#) (see [code](#)). Each application can be run, and the code inspected.

Until now, development of the code for such applications has been a completely manual process, with no automated assistance available. In order to make the coding process easier, DataLex has now developed a preprocessor program (*ylegis*), which takes a section of legislation (or multiple sections, or even a whole Act), and converts it automatically into a 'first draft' of DataLex code (*yscript*) for those legislative provisions. The pre-processed *yscript* code can immediately be run, to test how well the conversion to code has worked.

Three outcomes of the use of *ylegis* are possible:

- (i) Depending on the structure of the selected legislative provisions, the preprocessed code may need no change, in which case the goal of automated conversion of 'legislation into code' has been achieved. Examples are given below of sections 15KP and 15KQ of the *Crimes Act 1914* (Cth).
- (ii) In most cases, the preprocessed code will provide, at best, a useful 'first draft' of how the legislative provisions can be converted into the code required by DataLex. Further human editing of the pre-processed code will be necessary before it will run in a way which accurately represents the legislation.
- (iii) In some cases, the preprocessed code will not be a useful first draft, and it will be more efficient to start from scratch with manual encoding of the legislation.

The *ylegis* preprocessor is only in the early stages of development, so the variety of legislative forms that it can convert into code with sufficient accuracy and utility is at present very limited. However, it is undergoing rapid development, and the range of legislative forms that it can usefully convert will continue to expand.

An example of the type of provision which *ylegis* can now successfully convert is section 15KP of the *Crimes Act 1914* (Cth):

CRIMES ACT 1914 - SECT 15KP

*Assumed identity may be acquired and used*

A person may acquire or use an assumed identity if:

(a) the person is an authorised person (other than an authorised civilian) and the acquisition or use is:

(i) in accordance with an authority; and

(ii) in the course of duty; or

(b) the person is an authorised civilian and the acquisition or use is in accordance with:

(i) an authority; and

(ii) any direction by the person's supervisor under the authority.

The *ylegis* pre-processor automatically converts this section into the following *yscript* code:

```
RULE Section 15KP - Assumed identity may be acquired and used PROVIDES
the person may acquire or use an assumed identity ONLY IF
  section 15KP(a) applies OR
  section 15KP(b) applies

RULE Section 15KP(a) PROVIDES
section 15KP(a) applies ONLY IF
  section 15KP(a) (i) applies AND
  section 15KP(a) (ii) applies

RULE Section 15KP(a) (i) PROVIDES
section 15KP(a) (i) applies ONLY IF
  the person is an authorised person (other than an authorised civilian) and the
  acquisition or use is in accordance with an authority

RULE Section 15KP(a) (ii) PROVIDES
section 15KP(a) (ii) applies ONLY IF
  the person is an authorised person (other than an authorised civilian) and the
  acquisition or use is in the course of duty

RULE Section 15KP(b) PROVIDES
section 15KP(b) applies ONLY IF
  section 15KP(b) (i) applies AND
  section 15KP(b) (ii) applies

RULE Section 15KP(b) (i) PROVIDES
section 15KP(b) (i) applies ONLY IF
  the person is an authorised civilian and the acquisition or use is in accordance with
  an authority

RULE Section 15KP(b) (ii) PROVIDES
section 15KP(b) (ii) applies ONLY IF
  the person is an authorised civilian and the acquisition or use is in accordance with
  any direction by the person's supervisor under the authority
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This *yscript* code can be run without further amendment (for example, from the [DataLex Application Development Tools](#) page), and will provide a consultation with understandable questions (plus ‘Why’ and ‘How’ explanations of questions and conclusions) and accurate conclusions.

The *yscript* code can still be improved in order to generate a more sophisticated and engaging dialogue. For example, the replacement of ‘and’ with the logical connector ‘AND’ in various places, and the addition of the line ‘PERSON the person’, will improve both aspects.

At present, the easiest way to test what the *ylegis* pre-processor can do is to go to the [DataLex Application Development Tools](#) page <<http://datalex.org/dev/tools/>> and follow these steps:

- (i) Under the heading ‘Import legislative section (available on AustLII)’, select a section of an Australian Act by entering the Act name, jurisdiction and section number, and selecting ‘Import and replace’. This copies the text of the section into the ‘Edit DataLex application’ window.
- (ii) Select ‘*ylegis* preprocessor’ in order to convert the section into *yscript* code.
- (iii) Select ‘Check Syntax’ to see if there are any syntax issues with the generated *yscript* code.
- (iv) Select ‘Run Consultation’ in order to run a consultation, to test the conversion.
- (v) If the conversion is not satisfactory, go back to the Development Tools page and edit the preprocessed code in order to improve it. Select ‘Run Consultation’ again.

Feedback, examples and suggestions are welcome to [datalex@austlii.edu.au](mailto:datalex@austlii.edu.au)

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