PyCharm ANTLR4 Guide

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1 Introduction

In order to work with ANTLR4 from an IDE, we first need to install the ANTLR4 grammar plugin. In our case, we are going to write our code in Python3 and use the PyCharm IDE (based on IntelliJ). However, ANTLR4 has plugins available for most mainstream IDEs and ANTLR supports most of the modern languages.

Note: The plugin is going installed as the local user. This means that when working in the class room, you might have to re-install install the plugin every time you log on.
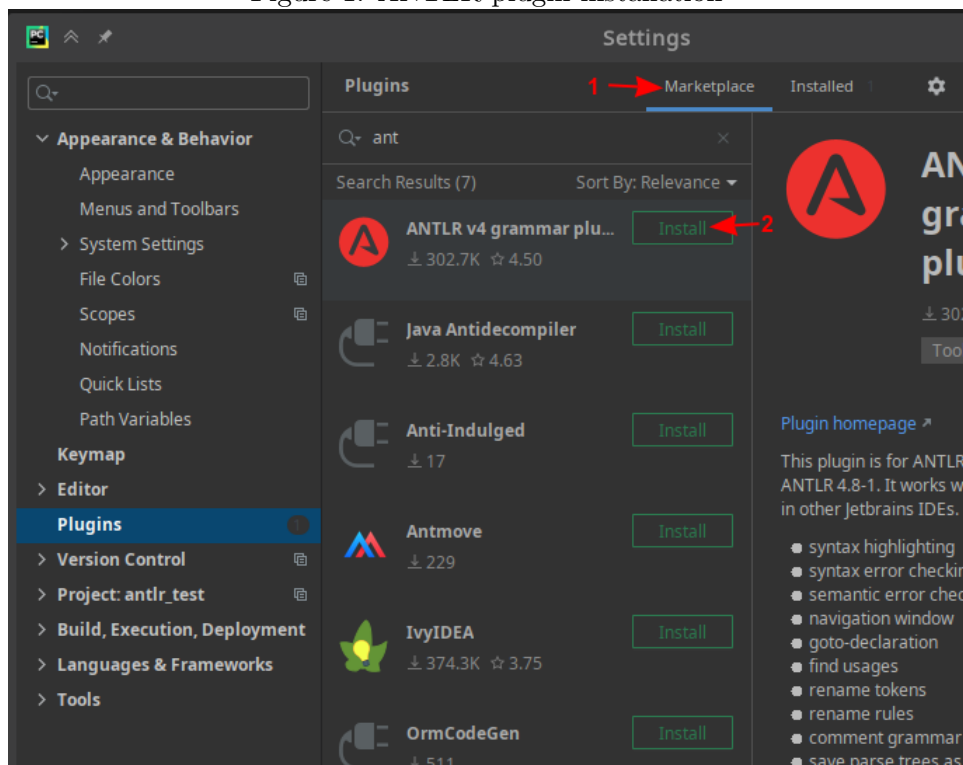
Contents

2 Environment Setup

1. **Create a new project in PyCharm**

    (a) Call the project **ANTLR_CSV_to_JSON**

    (b) Select **Python3** as the interpreter

2. **Install the plugin**

    (a) Open PyCharm settings window (press CTRL+ALT+S)

    (b) Open **Plugins** page

    (c) Click on the **Marketplace** tab

    (d) Search for ANTLR and install the plugin (Figure 1)

Figure 1: ANTLR plugin installation

    (e) Click **Restart IDE** to activate the plugin

Note that if you are using the lab computer, you need to redo this step every time after you have log on to the lab computer, as the user configuration gets deleted some time after logging off.

3   Installing the ANTLR runtime library

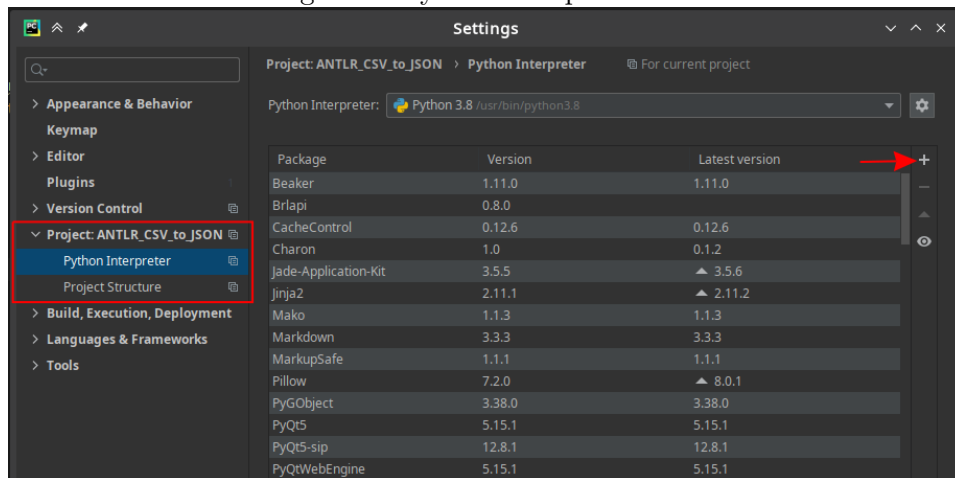There are two ways to install the ANTLR4 library for Python 3:

1. From command line using the python package installer (pip):

   `pip install -u antlr4-python3-runtime`.

   Please note that this might not work out-of-box in Windows, as the Windows version of Python does not come with pip installed by default.

2. Alternatively, the package can be installed through the PyCharm IDE, it should work on all OS-s

   (a) Open Settings

   (b) On the left, find the current project and under the project name choose the **Python Interpreter** tab and click on the **+** icon on the left side of the window (Figure 2).
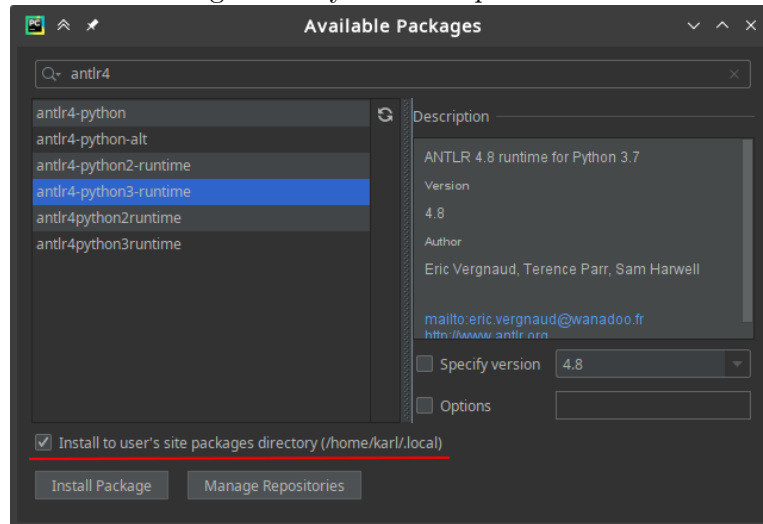
Figure 2: Python Interpreter Tab

   (c) Select the **antlr4-python3-runtime** package and install it.

   It is recommended to also select the **Install to user's site packages directory**, unless you want to perform a system-wide installation (Figure 3).

   Note that Windows installs Python by default to a local user directory, so this selection is unavailable in widows.

Note that if you are using the lab computer, you need to redo this step every time after you have log on to the lab computer, as the user configuration gets deleted some time after logging off.
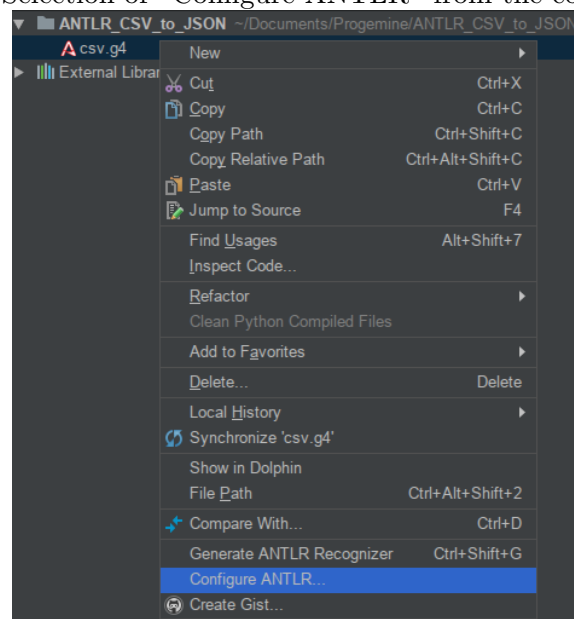
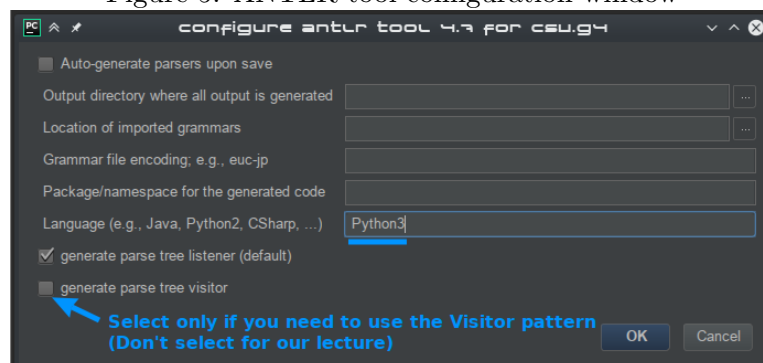Figure 3: Python Interpreter tab

4 Creating a New ANTLR File

1. Right-click on your project folder in PyCharm, select `New → File`

2. Enter `<grammar_name>.g4` as the file name (Ex: `csv.g4`)

3. Configure ANTLR for the current grammar (Figure 4):

    (a) Right click on the grammar file and choose `Configure ANTLR. . .`

Figure 4: Selection of "Configure ANTLR" from the context menu

    (b) In the opened dialog specify `Python3` as language (Figure 5).
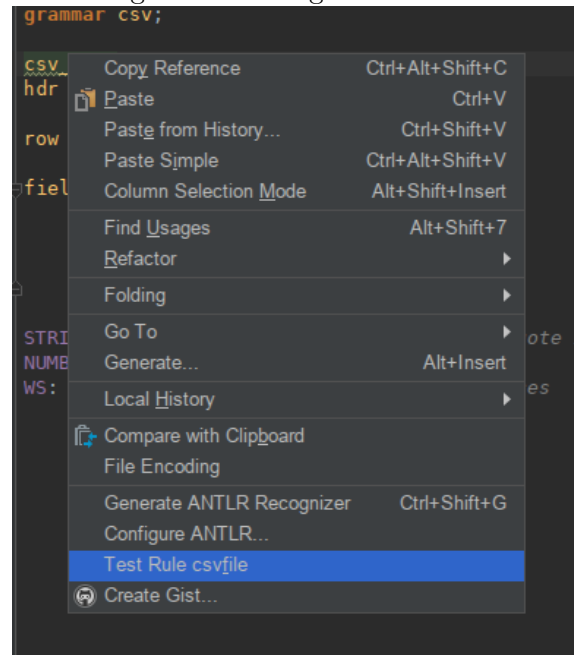
Figure 5: ANTLR tool configuration window

5   Testing ANTLR Rules

Right click on the top-level parser rule and choose
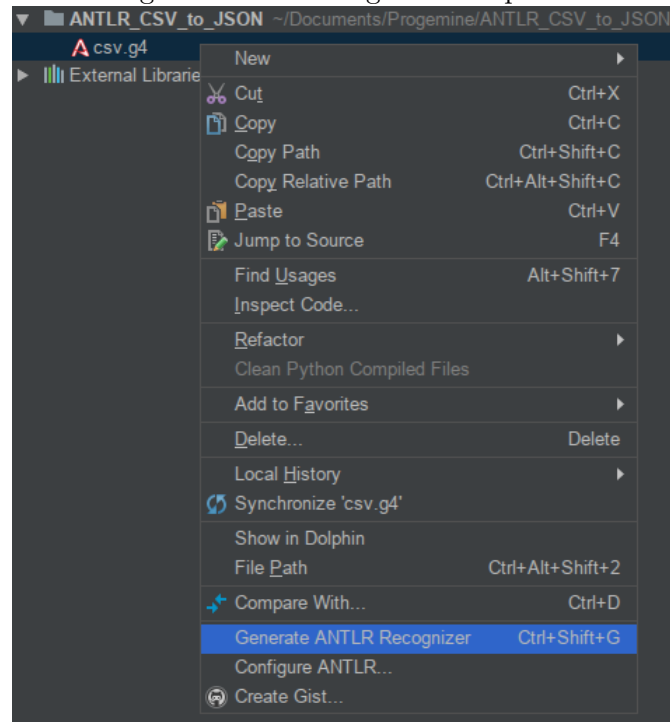**Test Rule** <**rule_name**> (Figure 6)

Figure 6: Testing ANTLR rule

6 Generating an ANTLR4 Parser

Right click on your **.g4** file and choose **Generate ANTLR Recognizer** from the menu (Figure 7).

Figure 7: Generating ANTLR parser

Debugging information

If you get the following error:
symbol file conflicts with generated code in target language or runtime

Then it means that you have specified a parser rule in your **.g4** file with a name that shadows a Python's built-in function name and thus it would be redefined. Please rename your rule.