ANTLR Installation

Professor: Dr. Parsa

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Install Java

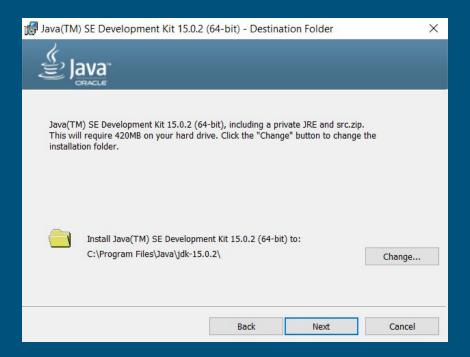
ANTLR is written in Java, so you must have Java installed on your machine even if you are going to use ANTLR with, say, Python. ANTLR requires a Java version of 1.6 or higher.

- Download Java Development Kit (JDK)
 Oracle java download page
 Or you can google for jdk and download it.
- 2. Install the JDK

Download JDK

Java SE Development Kit 15.0.2 This software is licensed under the Oracle Technology Network License Agreement for Oracle Java SE				
Product / File Description	File Size	Download		
Linux ARM 64 RPM Package	141.82 MB	Ů jdk-15.0.2_linux-aarch64_bin.rpm		
Linux ARM 64 Compressed Archive	157 MB	Ů jdk-15.0.2_linux-aarch64_bin.tar.gz		
Linux x64 Debian Package	154.81 MB	Ů jdk-15.0.2_linux-x64_bin.deb		
Linux x64 RPM Package	162.03 MB	Ů jdk-15.0.2_linux-x64_bin.rpm		
Linux x64 Compressed Archive	179.35 MB	Ů jdk-15.0.2_linux-x64_bin.tar.gz		
macOS Installer	175.93 MB	Ů jdk-15.0.2_osx-x64_bin.dmg		
macOS Compressed Archive	176.51 MB	Ů jdk-15.0.2_osx-x64_bin.tar.gz		
Windows x64 Installer	159.71 MB	Ů jdk-15.0.2_windows-x64_bin.exe		
Windows x64 Compressed Archive	179.28 MB	Ů jdk-15.0.2_windows-x64_bin.zip		

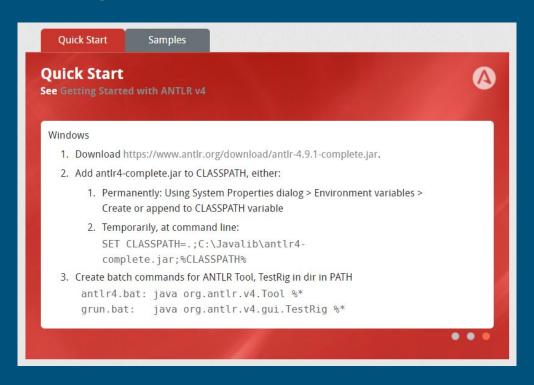
Install JDK



Install ANTLR

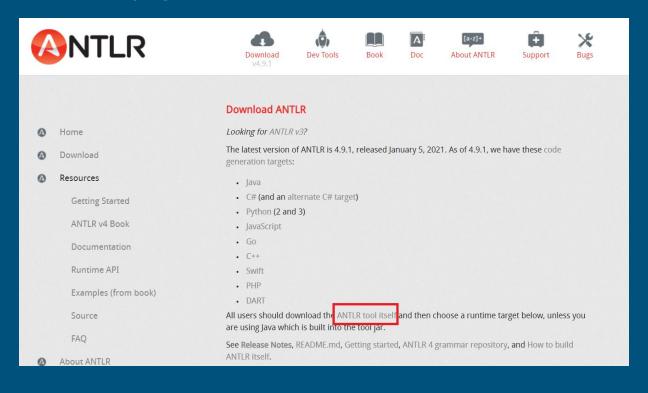
ANTLR official installation document:

https://www.antlr.org

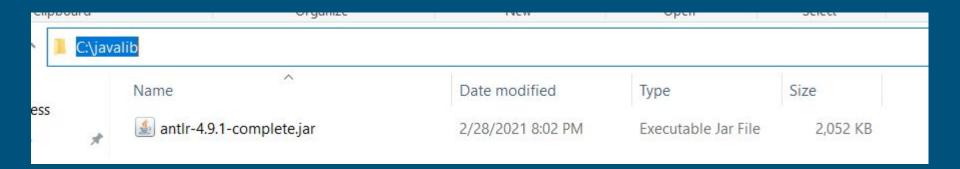


1. Download ANTLR jar file (version 4.9.1)

ANTLR download page

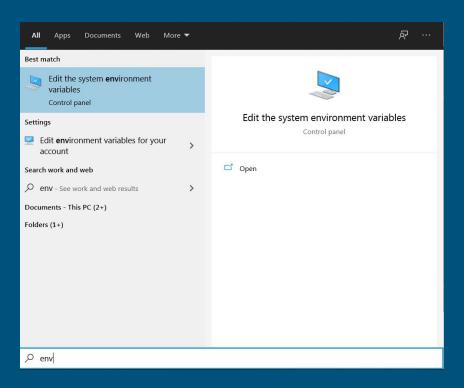


Save antlr-4.9.1-complete.jar to your directory for 3rd party Java libraries.
 C:\javalib

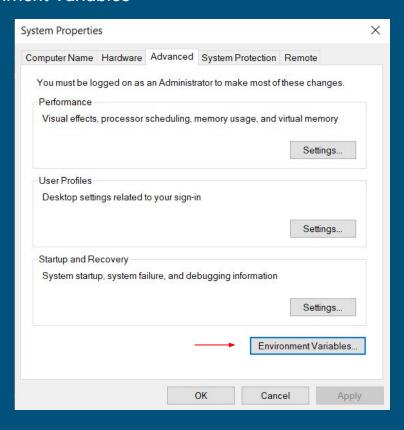


3. Add JDK bin files into Windows PATH variable.

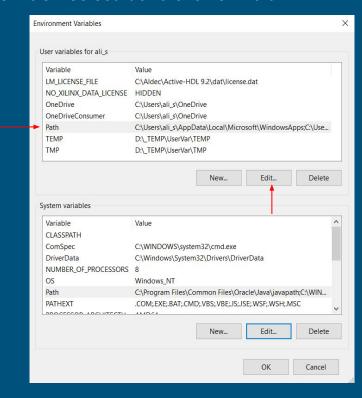
3.1. Use the windows search, to look for "env".



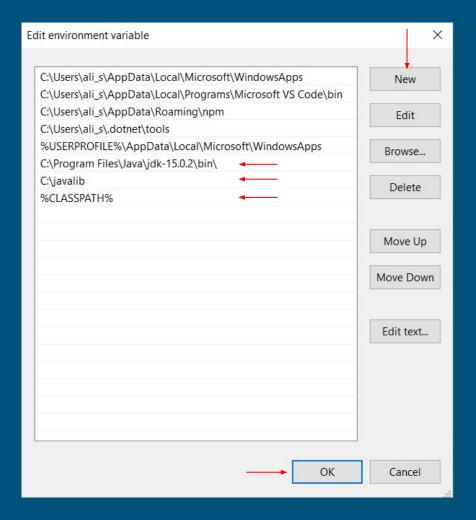
1.2. Click on "Environment Variables"



1.3. Inside User Variables look for a variable named "Path" or "PATH" And double click on it OR select it and click on Edit



- 1.1.1. Click on "NEW" to create a new value.
- 1.1.2. Enter jdk bin directory path:C:\Program Files\Java\jdk-15.0.2\bin\
- 1.1.3. Click on "NEW" to create a new value.
- 1.1.4. Enter java lib folder: C:\javalib\
- 1.1.5. Click on "NEW" to create a new value.
- 1.1.6. Enter java class path: %CLASSPATH%

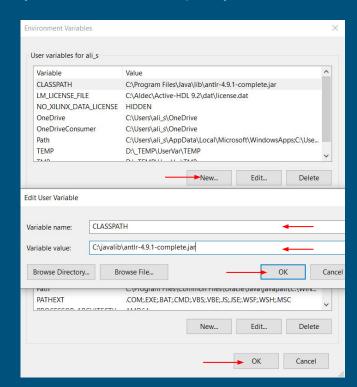


4. Add ANTLR jar file into Windows CLASSPATH variable.

4.1. Inside User Variables click on "New..." button and enter following fields as:

Variable name: CLASSPATH

Variable value: C:\javalib\antlr-4.9.1-complete.jar



5. Create batch commands for ANTLR Tool, TestRig in lib directory

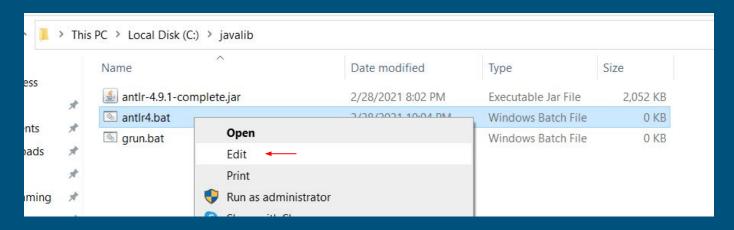
5.1. Inside C:\javalib\ create 2 new files: antlr4.bat grun.bat

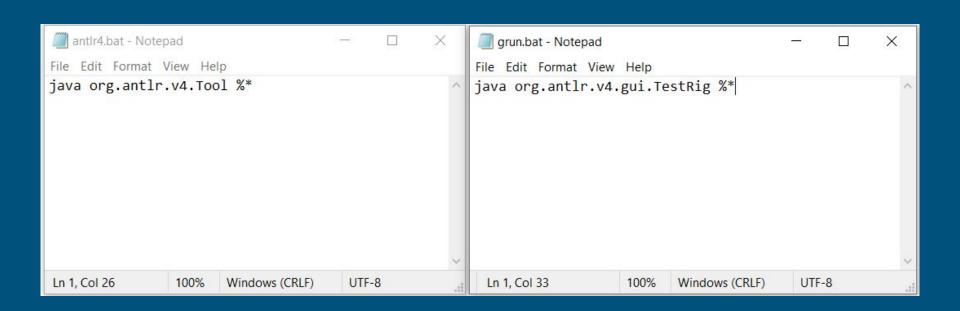
- 5.2. Open these bat files with notepad and copy and paste these lines.
 - 5.2.1. Inside antlr4.bat:

java org.antlr.v4.Tool %*

5.2.2. Inside grun.bat:

java org.antlr.v4.gui.TestRig %*





Now you need to check if ANTLER and Java are installed successfully. Inside powershell enter these commands:

- java --version
- antlr4

```
Windows PowerShell
PS C:\Users\ali s> java
iava 15.0.2 2021-01-19
Java(TM) SE Runtime Environment (build 15.0.2+7-27)
Java HotSpot(TM) 64-Bit Server VM (build 15.0.2+7-27, mixed mode, sharing)
PS C:\Users\ali s> antlr4
C:\Users\ali s>java org.antlr.v4.Tool
ANTLR Parser Generator Version 4.9.1
                    specify output directory where all output is generated
                    specify location of grammars, tokens files
 -atn
                    generate rule augmented transition network diagrams
 -encoding
                    specify grammar file encoding; e.g., euc-jp
 -message-format specify output style for messages in antlr, gnu, vs2005
 -long-messages
                    show exception details when available for errors and warnings
 -listener
                     generate parse tree listener (default)
 -no-listener
                     don't generate parse tree listener
 -visitor
                     generate parse tree visitor
 -no-visitor
                     don't generate parse tree visitor (default)
 -package
                     specify a package/namespace for the generated code
 -depend
                     generate file dependencies
 -D<option>=value
                    set/override a grammar-level option
 -Werror
                     treat warnings as errors
 -XdbgST
                     launch StringTemplate visualizer on generated code
 -XdbgSTWait
                     wait for STViz to close before continuing
 -Xforce-atn
                     use the ATN simulator for all predictions
 -Xlog
                     dump lots of logging info to antlr-timestamp.log
 -Xexact-output-dir all output goes into -o dir regardless of paths/package
PS C:\Users\ali s>
```

Run ANTLR to generate Parser and Lexer

- ★ ANTLR grammar files have **.g4** extension.
- ★ You may generate lexer and parser for every languages such as C# , Java, and Python.

For testing purposes download cpp14.g4 grammar file. https://github.com/antlr/grammars-v4/blob/master/antlr/antlr4/examples/CPP14.g4

★ Inside CPP14.g4 directory open a powershell and enter below command:

antlr4 -listener -visitor -Dlanguage=CSharp CPP14.g4

★ Which antlr4.bat will translate it into: java org.antlr.v4.Tool -listener -visitor -Dlanguage=CSharp CPP14.g4

```
Windows PowerShell

PS C:\Users\ali_s\Desktop\Antlr grammar files> antlr4 -listener -visitor -Dlanguage=CSharp CPP14.g4

C:\Users\ali_s\Desktop\Antlr grammar files>java org.antlr.v4.Tool -listener -visitor -Dlanguage=CSharp CPP14.g4

PS C:\Users\ali_s\Desktop\Antlr grammar files>
```

That command will generate Lexer, Parser, Listener, Visitor files.

Name	Date modified	Туре	Size
CPP14.g4	2/28/2021 10:40 PM	G4 File	28 KB
CPP14.interp	2/28/2021 10:40 PM	INTERP File	95 KB
CPP14.tokens	2/28/2021 10:40 PM	TOKENS File	4 KB
CPP14BaseListener.cs	2/28/2021 10:40 PM	CS File	130 KB
CPP14BaseVisitor.cs	2/28/2021 10:40 PM	CS File	108 KB
CPP14Lexer.cs	2/28/2021 10:40 PM	CS File	103 KB
CPP14Lexer.interp	2/28/2021 10:40 PM	INTERP File	51 KB
CPP14Lexer.tokens	2/28/2021 10:40 PM	TOKENS File	4 KB
CPP14Listener.cs	2/28/2021 10:40 PM	CS File	99 KB
CPP14Parser.cs	2/28/2021 10:40 PM	CS File	817 KB
CPP14Visitor.cs	2/28/2021 10:40 PM	CS File	59 KB

★ You can generate Lexer, Parser, Listener, Visitor files for any programming language by setting:

-Dlanguage=???

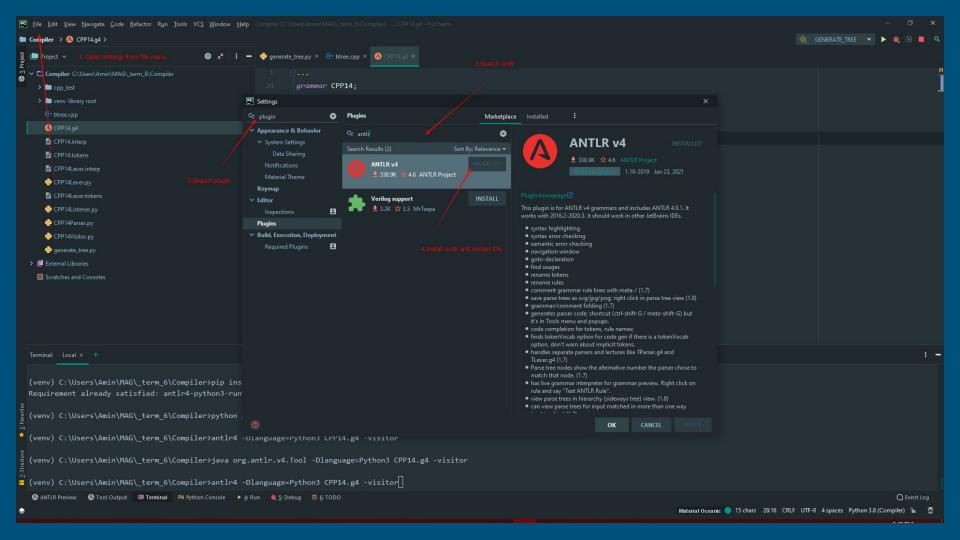
??? can be: Java, Python3, Python2, ...

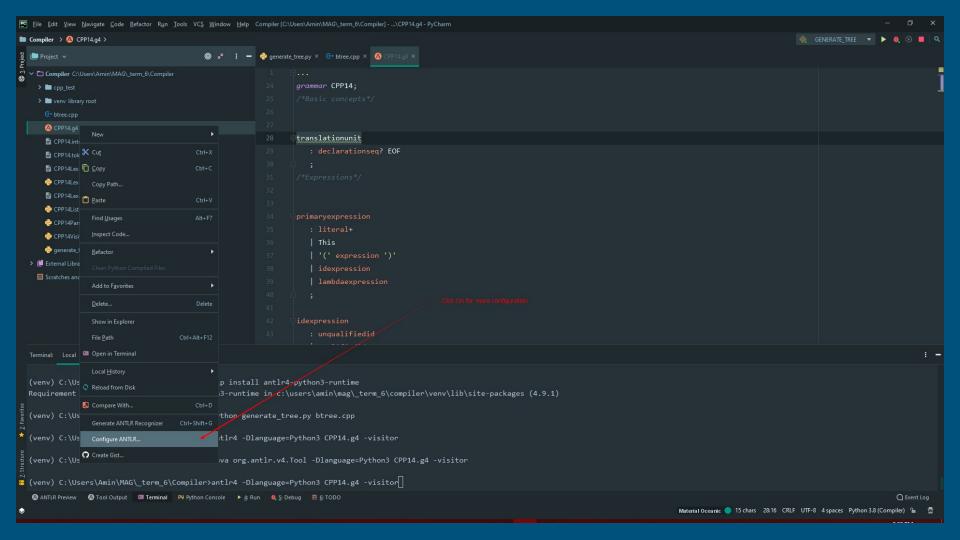
For example:

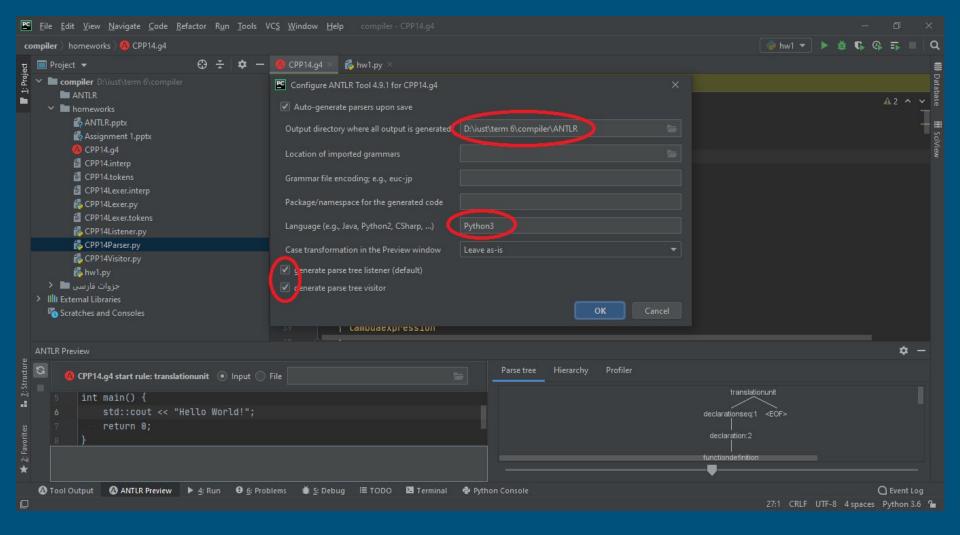
antlr4 -listener -visitor -Dlanguage=Java CPP14.g4

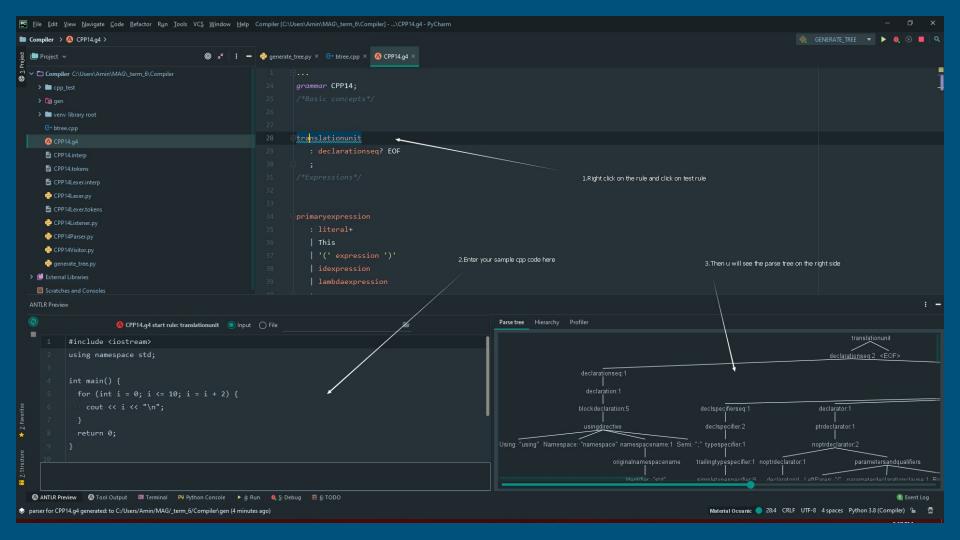
Name	Date modified	Туре	Size
CPP14.g4	2/28/2021 10:40 PM	G4 File	28 KB
CPP14.interp	2/28/2021 11:01 PM	INTERP File	95 KB
CPP14.tokens	2/28/2021 11:01 PM	TOKENS File	4 KB
CPP14BaseListener.java	2/28/2021 11:01 PM	IntelliJ IDEA	71 KB
CPP14BaseVisitor.java	2/28/2021 11:01 PM	IntelliJ IDEA	52 KB
CPP14Lexer.interp	2/28/2021 11:01 PM	INTERP File	51 KB
CPP14Lexer.java	2/28/2021 11:01 PM	IntelliJ IDEA	51 KB
CPP14Lexer.tokens	2/28/2021 11:01 PM	TOKENS File	4 KB
CPP14Listener.java	2/28/2021 11:01 PM	IntelliJ IDEA	73 KB
CPP14Parser.java	2/28/2021 11:01 PM	IntelliJ IDEA	649 KB
CPP14Visitor.java	2/28/2021 11:01 PM	IntelliJ IDEA	43 KB

Install Antlr Plugin

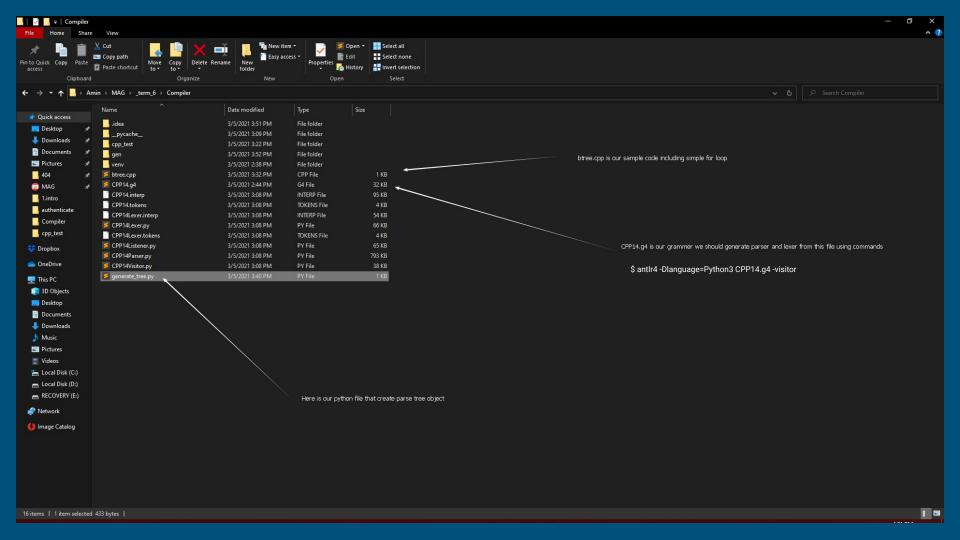


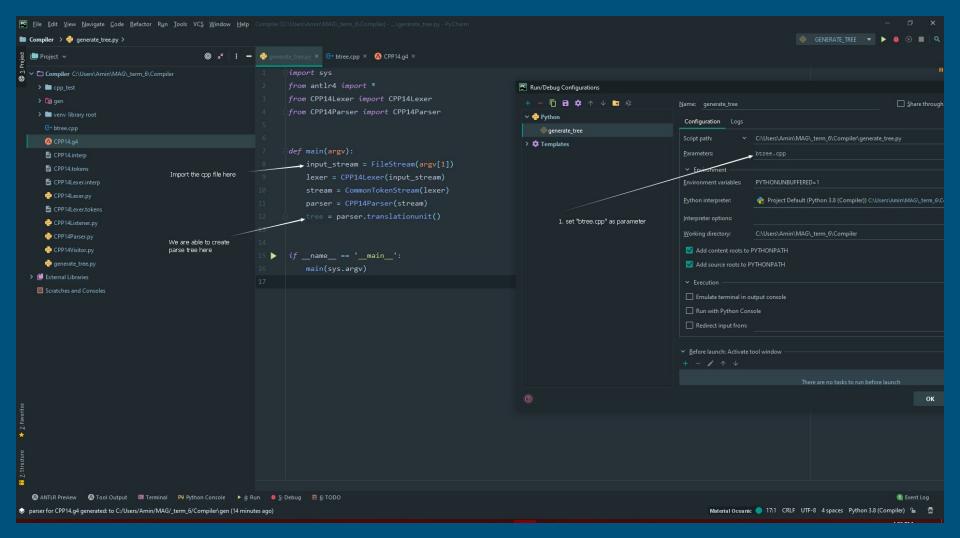


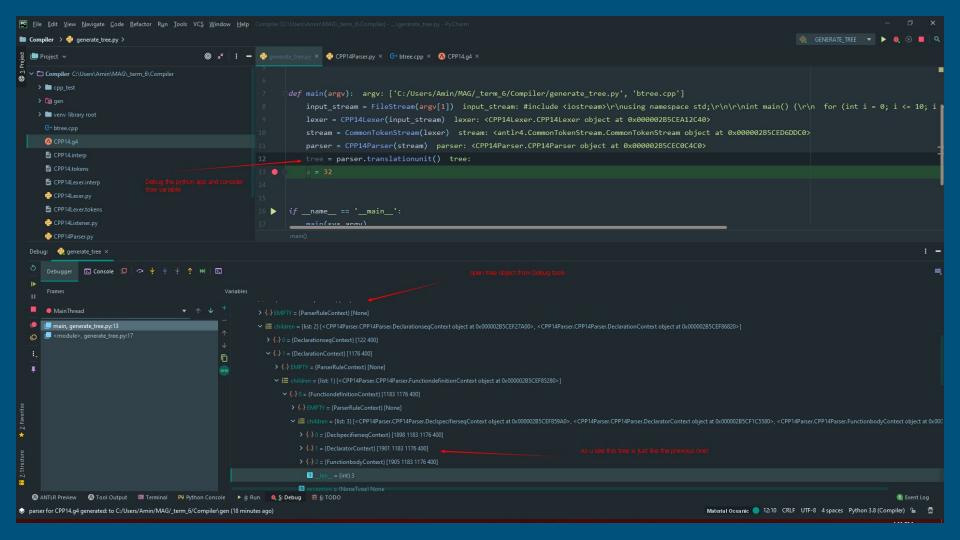




Generate Parse Tree in Python



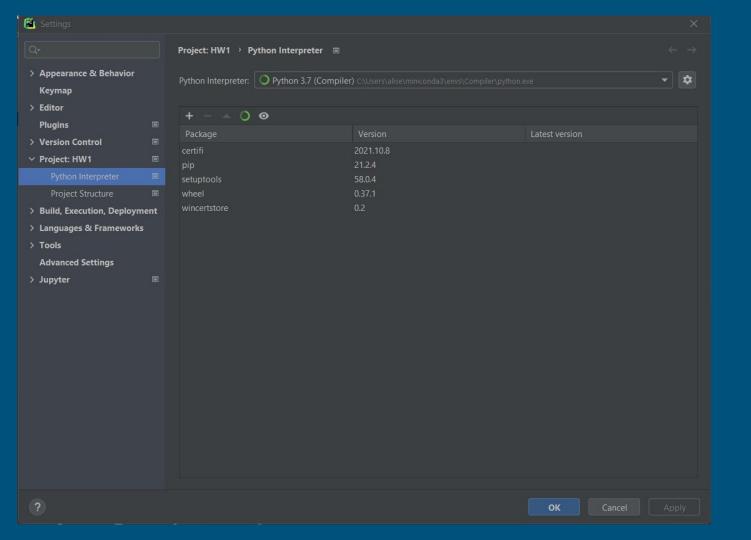


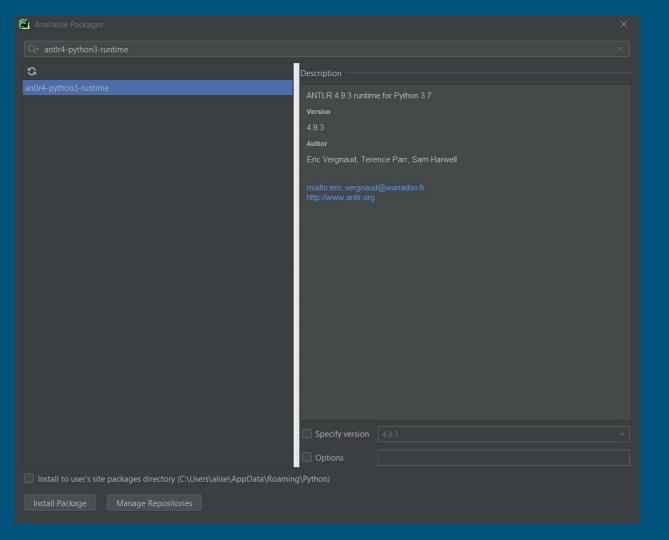


ANTLR4 Python Package

- ★ There is a python package called "antlr4-python3-runtime"
- ★ You can install it globally via:
 - o pip install antlr4-python3-runtime

- ★ Or you can install it on PyCharm
 - Go to PyCharm Settings
 - Project: [Project_Name]
 - Python Interpreter
 - Install
 - Search for "antlr4-python3-runtime"
 - Install Package





Thank You!